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System Analysis Report

Human Factors Engineering System Analysis of CF18A Air to Ground Operations

Mike Wellwood
The HFE Group

Nadine Wellwood
The HFE Group

Didier Toussaint
Top Aces Consulting

Defence and Civil Institute of Environmental Medicine

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Author
Mike Wellwood

Author
Nadine Wellwood

Author
Didier Toussaint

Approved For Release By
Nadine Wellwood
Document Manager

Abstract

The Directorate of Aerospace Requirements (**DAR 5**) is in the process of upgrading the CF-18A to maintain its technical currency over the next 20 years. Part of this upgrade will be the inclusion of a Helmet Mounted Display (**HMD**) with a Night Vision Imaging System (**NVIS**) capability.

The Defence and Civil Institute of Environmental Medicine (**DCIEM**) has undertaken an investigation of HMD and NVIS technologies in order to provide DAR with advice on human factors issues that may arise from their use in the CF-18A. The investigation will focus on the Air to Ground role of the CF-18A as this is the most likely role in North Atlantic Treaty Organization (**NATO**) and coalition activities. The Air to Ground role of the CF-18A also presents a high cognitive demand on the skills and abilities of the pilot.

This report is the second of two Human Factors Engineering (**HFE**) reports prepared for DCIEM in support of DAR 5. The first report is a Mission Analysis Report of CF18 Air to Ground Operations and should be read in conjunction with this report. This report provides the detailed results of an HFE study of the employment of the CF-18A in an operational Air to Ground environment. The analysis was conducted without the inclusion of the HMD in order to provide a baseline for assessing the future impact of HMD and NVIS procurements on the modernized fighter.

This report includes a Goal Decomposition, Goal Allocation, Operation Sequence Diagrams, Critical Goal Analysis and a Perceptual Control Theory (**PCT**) based Information Flow and Processing Analysis. The results of the HFE Analysis will be used to assess the impact of HMD and NVG technologies and the flow of information in the cockpit of the Modernized CF-18A.

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Executive Summary

This report is the second of two Human Factors Engineering (**HFE**) reports prepared for the Defence and Civil Institute of Environmental Medicine in support of the Directorate of Aerospace Requirements (**DAR 5**) of the Department of National Defence (**DND**). The objective of the Human Factors Engineering System Analysis of CF-18A HMD was to establish a baseline of information that could be used to assess the impact of HMD and NVIS technologies on the flow of information in the cockpit of the Modernized CF-18A.

This report documents the findings of the HFE Analysis of the CF-18A in an Air to Ground Role in accordance with the Statement Of Work (**SOW**), Public Works and Government Services Canada (**PWGSC**) Solicitation No. W7711-007675/A.

The analysis follows the general principles and guidelines for HFE as described in MIL-HDBK-46855 "Human Engineering Program Process and Procedures". Specifically, this report addresses the objectives of the SOW to develop a detailed description of the information flow and processing based on a defined CF-18A equipment suite and the employment of the CF-18A in an operational Air to Ground environment. Unlike traditional mission, function and task analyses conducted by DCIEM in the past, this project is based on Perceptual Control Theory (**PCT**) and uses the concept of goals in place of traditional tasks. It also bases the information flow and processing analysis on the individual PCT based data for each goal unlike a traditional information flow and processing analysis conducted on an entire mission segment.

For the purposes of this study, the assumed air vehicle will be the post CF-18A modernization aircraft configuration, avionics sub-systems, weapons systems and Defensive Electronic Warfare Suite (**DEWS**). The assumed air vehicle will incorporate the CF-18A Incremental Modernization Program and Capital Program initiatives described in the Mission Analysis Report, The HFE Group Document # 42-014-001. Although the CF-18A HMD will be an integral part of the CF-18A modernization, for the purpose of establishing an initial reference database, it was not included as part of the assumed air vehicle.

The System Analysis Report includes a goal decomposition, goal allocation analysis, critical goal analysis, operational sequence diagrams and a PCT based information flow and processing analysis. As the intent of this project was to establish a baseline for future work, there are no design recommendations or detailed findings of the suitability of the proposed mission kit.

As a separate task, the results of the system analysis were entered into the Integrated Performance Modelling Environment (**IPME**) to support future modelling activities. The task networks were populated and the initial IP/PCT data was entered. In order to produce useable results from the IPME model, an additional modelling effort would be required. This additional effort was scheduled as an optional work package to be exercised at a later time.

Table of Contents

List of Figures

Annexes

Acknowledgements

This System Analysis Report expands upon an initial study conducted by BAE SYSTEMS CANADA INC. (BSC) and makes maximum reuse of much of the methodology contained within the CF188 APG-65 Radar Human Factors Engineering Study Reports published between May 2000 and December 2000 (Contract Serial Number W7714-9-0281). To avoid unnecessary repetition of methodology descriptions, the reader is referred to the corresponding BSC document containing the detailed description.

The Microsoft Access Database used to facilitate data entry and produce the required reports was provided to The HFE Group by DCIEM as Government Furnished Information (**GFI**). The database was originally developed by Mr. Mike Wellwood under sub-contract to BSC and has been used successfully on many Human Factors projects. The database provided was highly modified to meet the project specific needs of this analysis and has been delivered back to DCIEM for use on future projects.

Introduction

General

The Directorate of Aerospace Requirements (**DAR 5**) is in the process of upgrading the CF-18A to maintain its technical currency over the next 20 years. Part of this upgrade will be the inclusion of a Helmet Mounted Display (**HMD**) with a Night Vision Image System (**NVIS**) capability.

As the use of HMD and NVIS technologies in the CF-18A represent new ways of performing old tasks, it was determined essential to establish how this technology would be used and to document the flow of information in the cockpit.

The Defence and Civil Institute of Environmental Medicine (**DCIEM**) has undertaken an investigation of HMD and NVIS technologies in order to provide DAR with advice on human factors issues that may arise from their use in the CF-18A. The investigation will focus on the Air to Ground role of the CF-18A as this is the most likely role in North Atlantic Treaty Organization (**NATO**) and coalition activities. The Air to Ground role of the CF-18A also presents a high cognitive demand on the skills and abilities of the pilot.

The purpose of the Human Factors Engineering (**HFE**) Analysis of the CF-18A HMD is to provide an initial human factors analysis of the CF-18A in an operational Air to Ground role. This information is presented in two parts: a Mission Analysis Report and a System Analysis Report. When combined these two reports establish a baseline of information that can be used to assess the implications of employing HMD and NVIS technologies in the CF-18A.

The results of the Mission Analysis Report included a description of the assumed air vehicle, a Composite Mission Scenario and identified potential Measures of Effectiveness.

For the purposes of this study, the assumed air vehicle was the post CF-18A modernization aircraft configuration, avionics sub-systems, weapons systems and Defensive Electronic Warfare Suite (**DEWS**). The assumed air vehicle incorporated the CF-18A Incremental Modernization Program (**IMP**) and Capital Program initiatives described in the Mission Analysis Report. Although the CF-18A HMD will be an integral part of the CF-18A modernization, for the purpose of establishing an initial reference database, it was not included as part of the assumed air vehicle.

The results of the HFE Analysis will establish a baseline of information that can be used to assess the impact of HMD and NVIS technologies and their impact on the flow of information in the cockpit of the Modernized CF-18A.

As a separate task, the results of the HFE Analysis were entered into IPME to support future modelling activities.

Purpose

The purpose of this System Analysis Report is to communicate the findings of a Human Factors Engineering Analysis of the CF-18A in an operational Air to Ground role. The results of the HFE Analysis were used to populate a baseline Integrated Performance Modeling Environment

(**IPME**) model that can subsequently be used to support future modelling activities and the assessment of the impact of HMD and NVG technologies on the Modernized CF-18A.

This System Analysis Report includes: a functional/goal decomposition, a goal allocation analysis, a critical goal analysis, operational sequence diagrams (OSD's), and a Perceptual Control Theory (**PCT**) based information flow and processing analysis.

Objectives

In order to achieve the purpose described above, the following objectives were identified:

a. Conduct a functional goal decomposition;
b. Produce function flow diagrams (**FFD**s);
c. Conduct a goal analysis;
d. Conduct a goal criticality analysis;
e. Produce operational sequence diagrams (**OSD**s);
c. Conduct a PCT based information flow and processing analysis;
d. Build goal networks of the critical mission segments within IPME; and
e. Populate the IP/PCT data for each goal within IPME.

Scope

The System Analysis Report may be read as a standalone analysis of the employment of the CF-18A in an operational Air to Ground role but is better understood when put into context and reviewed after reading the Mission Analysis Report.

When combined with the Mission Analysis Report, the System Analysis Report provides the Project Manager with a baseline of information that can be used to support future modelling activities.

The results of the HFE Analysis will establish a baseline of information that can be used to assess the impact of HMD and NVIS technologies and their impact on the flow of information in the cockpit of the Modernized CF-18A.

Report Organization

The report is organized into seven sections as follows:

a. Section One – Introduction. Section One provides background information, the purpose and objectives of the analysis, and the scope and organization of the report.
b. Section Two – Functional/Goal Decomposition.
c. Section Three – Goal Allocation Analysis
d. Section Four – Operational Sequence Diagrams
e. Section Five – Critical Goal Analysis

f. Section Six – Information Flow and Processing Analysis

g. Section Seven – References. Section Seven documents a listing of references used in producing this report.

Annex A – Glossary of Terms and Acronyms.

Annex B – Function Flow Diagrams

Annex C – Goal Inventory

Annex D – Goal Allocation Criteria and Weights

Annex E – Goal Allocation

Annex F – Goal Inventory with Completion Times

Annex G – Goal Criticality

Annex H – Operational Sequence Diagrams

Annex I – PCT Goal Analysis Results

Functional Goal Decomposition

The HFE Group based the analysis on the top-level functions identified in the CF188 APG-65 Radar Human Factors Engineering Study, Mission Analysis Report [Reference 1]. As the focus of this project was to analyze the CF18 in the Air to Ground role, only function number seven identified in the following Function Flow Diagram (**FFD**) was decomposed.

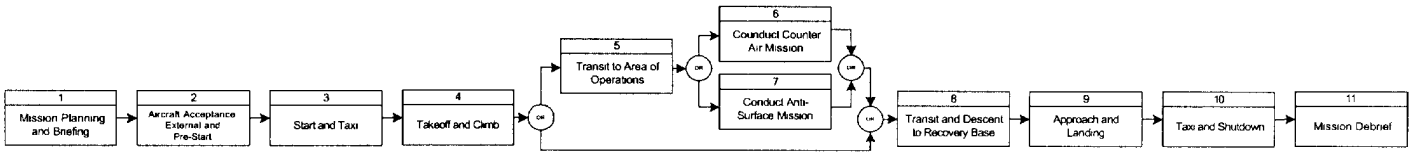

Figure 1 CF18 Top Level Functions

Function seven, 'Conduct Anti-Surface Mission' was decomposed down an additional two levels and FFDs were generated to support each level. The FFDs generated as a result of this analysis are included as Annex B to this document.

The Human Factors (**HF**) Analyst and Subject Matter Experts (**SMEs**) conducted a thorough review of the FFDs to ensure the diagrams effectively represented an actual CF-18 air to ground mission. During the generation of the FFDs, the team tried to remain consistent with the work previously conducted under the CF188 APG-65 Radar Human Factors Engineering Study, Mission Analysis Report [Reference 1]. There was however, one exception with the modelling of function 7.7, React to Threats. This function was presented in each second level FFD within the BSC analysis. For the purposes of this contract it was determined that 'React to Threats' should be identified as a separate first level function.

During the initial development of the FFDs, all of the CF18 primary air to ground missions were identified on the first level FFD. This created an extremely large diagram that would have added significant complexity to the subsequent analysis. After a detailed cognitive walkthrough of each mission type with the SMEs, it was determined that the missions could be logically grouped into first level functions that would capture the activities of each detailed mission type. It is important to note that although the first level FFD does not name the mission type specifically, the functions performed for all air to ground missions are contained within one of these higher level functions.

Figure 2 represents the initial first level functions identified versus the final first level functions that were selected.

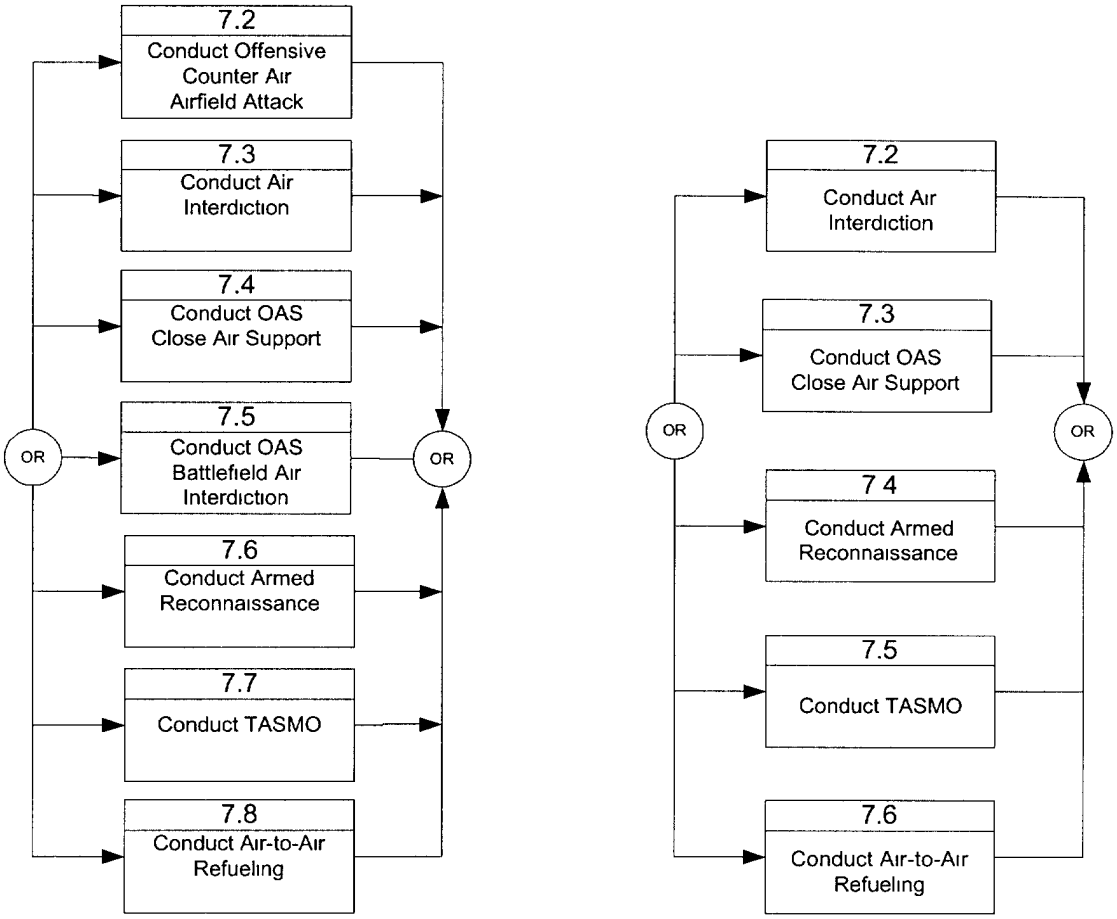

Figure 2 Initial First Level Functions vs. Final First Level Functions

Upon completion, the decomposition of the top and first level goals (functions) were submitted to the Scientific Authority (**SA**) and Technical Authority (**TA**) for review. This early review enabled the SA and TA to track the work as it was completed and encouraged feedback that was incorporated into the diagrams at an early stage thus preventing the potential for re-work due to misunderstandings or a lack of communication.

Following the review of the top and first level goals, the goals were further decomposed down to the fourth level. Although this analysis did not require all lowest level goals to exist at the fourth level, consistency with traditional Mission Function and Task Analysis (**MFTA**) techniques was utilized to ensure ease of data import/export and numbering and to provide a common framework for the analysis. The Access Database that was used to populate the data at the first and second levels was also used for entering the detailed data down to the fourth level.

Because time was very limited on this project (40 working days), only the information required to populate the Operational Sequence Diagrams (**OSDs**) was generated at this step in the analysis. The information gathered consisted of Goal Number, Goal Label, Goal Description, and a Goal Completion Time (an average time only with no distribution). This was enough

information to conduct a Critical Goal Analysis and encouraged a concentrated effort that focused on the population of critical mission segment data.

The SMEs used Microsoft Access 2000 for data entry and storage. The database was developed from a Microsoft Access 97 database provided to The HFE Group as Government Furnished Information (**GFI**). The database enhanced the SMEs ability to distribute the work (including offsite distribution) allowing each SME to work on a replica of the original database. Each replica was then subsequently synchronized to the master database at regular intervals throughout the project.

At the fourth level, source goals were used to minimize repetition within the database. Because each high level function contained a sub-function, the fourth level goal would be 'mapped' to the first occurrence of the same goal within the database. For example, goal number 7.2.3.1(c) Conduct Formation Join Up has a source goal number of 7.1.1.3(c). This indicated that Conduct Formation Join Up occurred in section 7.2 Conduct Air Interdiction and in section 7.1 Conduct Tactical Rendezvous. Since the goal is the same in both sections, only the first occurrence of the goal is populated with data. All subsequent goals from other sections were then mapped to this source goal. In total, there were 908 individual fourth level goals identified. All 908 goals can be mapped to 268 source goals.

A complete inventory of goals is presented as Annex C to this document.

Goal Allocation Analysis

Following the completion of the goal decomposition down to the fourth level, a goal allocation analysis was conducted. The method used to conduct this analysis was in accordance with MIL-HDBK-46855A. This methodology is commonly employed and has been used for numerous Air Force HF projects in previous years for DCIEM and DTA. For a detailed description of the methodology, please refer to the CF188 APG-65 Radar Human Factors Engineering Study, Function and Task Analysis Report [Reference 2].

The Microsoft Access Database contained an environment for conducting function allocation that was optimized for this project. To save time and effort, the existing default weighting factors identified in the CF188 APG-65 Radar Human Factors Engineering Study, Function and Task Analysis Report were used. These weighting factors have been used on previous projects and were verified for applicability to the CF-18 project [Reference 2].

The following table identifies the criteria used for conducting the goal allocation and their associated weights:

Table 1 Goal Allocation Criteria and Weights

CRITERIA	WEIGHT
Boredom	0 012
Complexity	0.051
Computation	0.031
Concept of Operations	0.084
Data Measurement	0.035
Data Sensing	0.057
Dexterity	0.029
Info Availability	0 055
Input Sensitivity	0.061
Intelligence	0.053
Memory	0.055
Mobility	0.011
Pattern Recognition	0.074
Power	0.013
Problem Solving	0.057
Reasoning	0.066
Reliability	0 051
Response Time	0.047

CRITERIA	WEIGHT
Situation Awareness	0.059
Technical Risk/Cost	0.027
Verbal Task	0.073

Before commencing work on the goal allocation, it was first necessary to provide the SMEs who had conducted the previous work under the supervision of the HF Analyst, with a definition of each of the criteria. It was essential that all the SMEs fully understood each of the criteria before populating the data. The following verbal anchors were used to determine whether the goal was best performed by the human or the machine.

1. Problem Solving

Machine: This task requires only a single, well-defined approach for optimal problem solution.

Human: This task requires the selection and use of multiple methods, trial and error, improvisation, and/or knowledge acquired in the course of the mission for optimal problem solution.

2. Computation

Machine: This task requires complex or repetitive calculations to be performed with precision.

Human: This task requires only estimations or generalizations to be made and precision is not essential.

3. Complexity

Machine: This task requires simultaneous multiple-channel data input and/or output (e.g. receive/process visual and aural information simultaneously).

4. Computation

Machine: This task requires complex or repetitive calculations to be performed with precision.

Human: This task requires estimations or generalizations to be made and precision is not essential.

5. Concept of Operations

Machine: N/A

Human: The current concept of operations requires that a human perform this task because of the safety, moral, ethical or policy aspects of the task.

6. Data Measurement
Machine: This task requires the measurement of signals (e.g. temperature, contamination level, radar range) in absolute and precise terms.

Human: This task requires the determination or generalization of relative signal levels or on-off states, rather than precise and absolute measurement.

7. Data Sensing
Machine: This task requires the detection of signals that are outside the range of human perception, such as Infra-Red (IR).

Human: N/A

8. Dexterity
Machine: N/A

Human: This task requires great dexterity and/or versatile and adaptive manipulation of objects.

9. Information Availability
Machine: N/A

Human: Some or all of the information required to complete this task cannot be provided through a data bus (i.e. electronically).

10. Input Sensitivity
Machine: N/A

Human: This task requires the detection of low absolute-value signals, and/or detection of signals through overlapping noise.

11. Intelligence
Machine: N/A

Human: This task requires the detection and reporting of low-probability events or information incidental to the primary task.

12. Memory
Machine: This task requires high-capacity and high-precision short and long-term memory with very short access time.

Human: This task requires multiple-access memory of concepts, principles and learned relationships.

13. Mobility
Machine: N/A

Human: This task requires mobility within the workspace environment.

14. Pattern Recognition
Machine: N/A

Human: This task requires the detection of variable and/or subtle patterns and trends.

15. Power
Machine: This task requires the consistent application of large, constant forces.

Human: N/A

16. Problem Solving
Machine: This task requires only a single, well-defined approach for optimal problem solution.

Human: This task requires the selection and use of multiple methods, trial and error, improvisation, and/or knowledge acquired in the course of the mission for optimal problem solution.

17. Reasoning
Machine: N/A

Human: This task requires inductive reasoning using incomplete information.

Reliability
Machine: This task requires a consistent level of performance over a long period.

Human: N/A

18. Response Time
Machine: This task requires very fast response times.

Human: N/A

19. Situation Awareness
Machine: N/A

Human: The performance of this task by a human operator contributes to that operator's maintenance of situational awareness.

20. Technical Risk or Cost
Machine: N/A

Human: A machine of the required capability or complexity would be very large, costly and/or would require more power than is economically feasible.

21. Verbal Task
Machine: N/A

Human: This task requires sending or receiving context-sensitive information expressed in verbal communication.

The SME used the Access Database to assign a value between –1,0 and 1 to each goal depending on whether the goal was better suited to the man (1) or machine (-1) for each criterion. A value of 2 (mandatory man) or –2 (mandatory machine) was entered for goals that were mandatory allocated to the 'man' or the 'machine' based upon doctrine or standard operating procedures.

The MS Access program was then used to calculate the values assigned to each goal allocation and a report was generated. All marginal allocations (those with a value between –0.065 and 0.065 representing no preference towards man or machine) were then revisited and overridden to 'man' or 'machine' by the HF analyst as required.

Out of the original 265 unique goals that were identified by the SMEs and HF Analysts, 79 goals were identified as being candidates for performance by the machine. There were also 38 marginal allocations that were re-visited by the analyst that resulted in 19 re-allocations.

Typically once a machine goal is identified, an additional human goal must be created to provide the monitoring function of this machine goal. This would have resulted in an additional 79 goals being created as a monitoring function of the machine goals. To reduce the time and effort associated with the completion of this task, it was determined that the machine goals as identified in the goal allocation would be re-written to describe the human function associated with monitoring the machine. All goals that were re-written to describe the human monitoring function have been clearly identified in the rationale column of Annex E Goal Allocation.

Operational Sequence Diagrams

General

Operational Sequence Diagrams of the Air-to-Ground segment of the Composite Mission Scenario were developed in accordance with MIL-HDBK-46855A. To facilitate greater flexibility in the creation of the OSDs, The HFE Group used Microsoft Visio 2000 to generate these diagrams. This application provided a graphical user interface that allowed the user to drag-and-drop elements onto the diagram and provided a **WYSIWYG** (what you see is what you get) interface such that the OSD was developed graphically rather than through a word processing text script. Visio allowed the entire OSD drawing to be displayed and printed on a plotter (28 x 41 sheets of paper) allowing the reader to easily follow along the timeline without interruption. This provided an excellent means of presenting the diagrams for SME reviews and minimized the confusion associated with hundreds of loose sheets of paper. MS Visio was flexible enough to allow for the integration of additional information to be displayed (such as the interaction with system components) and allowed an appropriate mapping with the corresponding mission scenario.

The significant advantage of developing the OSDs was to provide a basis for visualizing the detailed goal data against a timeline in order to determine where high workload or information processing problems may occur. The OSD's graphically depict the composite mission scenario against a timeline and enable the HF Analyst to identify the critical mission segments within the scenario that will require further analysis. They have proven to be particularly useful when analysing highly complex systems that require time critical information involving multiple users.

Symbology

OSDs make use of symbology to indicate actions, decisions, transmission of information and timing requirements that permit the HF Analyst to analyse the flow of information and operator tasks as they occur in relation to the mission timeline.

The symbology used in the OSDs followed the conventions as described in MIL-HDBK-46855 [Reference 8]. The following sub-paragraphs provide a brief summary of the symbology used in developing the operational sequence diagrams for the CF-18A Air to Ground role. If there was a requirement to deviate from MIL-HDBK-46855, an explanation is offered:

a. Task. A task symbol was represented by a circle and indicates an action, function or process is being performed.
b. Continuous Tasks. A continuous task symbol was used to indicate an ongoing (continuous) task that in most cases starts at the beginning of a segment or at the completion of another task. Continuous tasks are indicated by a circle (task symbol) with a vertical arrow that points downward from the centre of the symbol. Continuous tasks continue until they are interrupted.

c. Repeated Tasks. Tasks that are performed repeatedly are presented by a circle (a task symbol) with a hook that extends from the centre of the symbol. These tasks continue to repeat unless they are interrupted.

d. Transmit. When information was transmitted it was displayed as either a one-way communication or a two-way communication through the use of ARROWS. A double arrow indicated a participative method of communication (all parties participating) otherwise a single arrow was used to indicate a one-way communication. The direction of the arrow indicated the intended direction of the message.

e. Receipt. Whether one-way or two-way, a transmit arrow must have a receipt symbol. This half circle is the intended receiver of the message. There may or may not be a response to the message being received.

f. Task Interrupt and Resume Tasks. Due to the inherent time constraints of the project, it was determined that the OSDs would not include task interrupts and resume tasks as a general rule. However, on occasion the Subject Matter Expert felt it was necessary to identify a task interrupt that had a significant impact on the tasks being performed. As the information from the OSDs was used to populate the IPME models, this information can be entered directly into IPME as part of any follow on work.

g. Time Intervals. Time is displayed along the left hand side of the page in the column marked Time. Each task description is followed by a task completion time to assist the reader with the flow of events. Continuous tasks have been assigned a completion time of 999 for ease of recognition.

The following figure describes the symbols used in the development of the OSDs for the CF18A air to ground analysis.

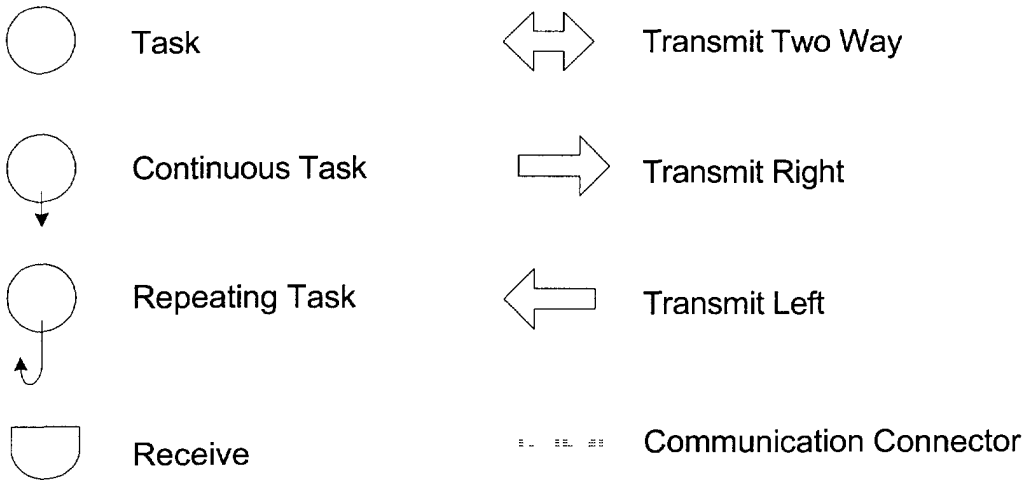

Figure 3 OSD Symbols

Each task contains the following additional information: Task ID, Task Description, and Completion Time. This information was used to assist the Analyst with the identification of each task, to improve readability and to assist with the identification of Critical Tasks within each

critical mission segment. This task information appears to the right and centre of each task except for transmit or receipt tasks when this information may appear under the dotted lines connecting the transmit/receipt symbols.

a. Task ID. The Task ID is a number [i.e. 7.7.5.2(b)] that corresponds to the Task ID in the MS Access 2000 Database. This database was modified and expanded upon to meet the requirements of this project.
b. Task Description. The task description is a brief narrative of the task being performed.
c. Task Completion Time. The task completion time is presented after the task description and represents the estimated time it would take to complete the task being performed. Please note that the task completion times do not take into account any variance. They are simply an estimate of the time it would take to complete the task as assigned by the Subject Matter Experts employed on this project. Continuous tasks have a completion time of 999 to indicate to the reader that they are continuous tasks.
d. Repeating Task Times. When a task is repeating, the repeat interval is provided.

Development of Operational Sequence Diagrams

The HFE Group generated four operational sequence diagrams to support the corresponding composite mission scenario as described in the Mission Analysis Report. The OSDs were used to provide a graphical representation of the tasks being performed against the mission segment timeline.

The four OSDs developed are listed as follows:

a. Mission Segment 7.1 – Conduct Air Interdiction RV

b. Mission Segment 7.2 – Conduct Air Interdiction

c. Mission Segment 7.2 – Conduct Night BAI

d. Mission Segment 7.3 – Conduct OAS/CAS

From within these four OSD's, six critical mission segments were identified and annotated with a blue box and mission segment title. These mission critical segments were identified as a result of conducting a critical goal analysis and are described in detail in the next section of this report. Upon completing the Critical Goal Analysis, the critical mission segments of the OSDs required further analysis. The results of this analysis are presented in an information flow and processing analysis, Section Six of this report and attached as Annex I, PCT Goal Analysis. It is the detailed results of the PCT based information flow and processing analysis that was used to populate the IPME models.

The Operational Sequence Diagrams are attached to this report as Annex H.

Critical Goal Analysis

A Critical Goal Analysis was conducted for each of the unique goals as identified in the MS Access 2000 database. The analysis was conducted in accordance with the techniques employed by DCIEM and DTA on other Air Force HF projects. For a complete description of the techniques used, please refer to the SOLE Methodology Documentation [Reference 6]. Each unique goal was given a number between 0 and 10 for each of the five criteria related to Goal Criticality. The criteria used in this analysis are described below:

1. **Safety**. A value from 1 to 10 is assigned according to the degree to which the non-completion, or incorrect completion, of a given task would adversely affect the safety of relevant personnel.

2. **Mission**. A value from 1 to 10 is assigned according to the degree to which the non-completion, or incorrect completion, of a given task would jeopardize or limit the successful completion of the mission.

3. **Efficiency**. A value from 1 to 10 is assigned according to the degree to which the non-completion, or incorrect completion, of a given task would reduce human efficiency by requiring corrective action by one or more individuals who would not normally have been involved.

4. **Reliability**. A value from 1 to 10 is assigned according to the degree that non-completion, or incorrect completion, of a task would adversely affect the long- or short-term reliability of the system. This included situations that would decrease the mean time between failures, result in the requirement for maintenance action, or render the system unserviceable for the remainder of the mission.

5. **Cost**. A value from 1 to 10 is assigned according to the degree to which the non-completion, or incorrect completion, of a given task would result in increased monetary cost.

Each unique goal was given a Goal Criticality Rating (TCR) between 1 and 10 (10 indicating the goal was absolutely critical to the successful completion of the mission). Each Goal was then assessed to determine if the demands of the goal approached the limits of human performance and to determine if conducting 'further analysis' of the goal would likely result in improvement. The final value assigned to each unique goal was an Adjusted Goal Criticality Rating (ATCR). The ATCR range was between 1 and 10 (10 being the most critical).

While populating the data for the ATCR, the team encountered some difficulty in addressing the 'further analysis' criteria. The 'further analysis' criteria is based upon an assumption by the HFE Analyst that 'further analysis' of the goal would likely result in improvement. After considering previous projects when this analysis may have been an important consideration, it was determined that there was not enough information available to address this criteria for this project and it was therefore assigned a value of 0. Due to this lack of information, there were no adjustments made to the TCR for this criteria.

To maintain consistency with naming conventions previously employed on other HF projects, the term TCR or Task Criticality Rating was used to describe the Goal Criticality Rating. The same applies for the ATCR or Adjusted Task Criticality Rating; ATCR was used to describe the Adjusted Goal Criticality Rating. The Microsoft Access database provided as GFI for this project was used to calculate the TCR and ATCR. When the database was initially developed it was designed with this functionality.

All goals with an assigned ATCR value of 8, 9 and 10 were deemed to be Critical Goals. These critical goals required further analysis to assist the HF Analyst with the identification of critical mission segments.

The OSDs were once again used and proved to be a valuable tool in determining the location of the critical goals within the mission. The OSDs were updated to include colour codes for each of the Critical Goals identified as a result of the Critical Goal Analysis. A critical goal with an assigned ATCR of 8 was also assigned a colour code of blue, a goal with an ATCR of 9 was assigned a colour code of yellow, and any goal with an ATCR of 10 (and considered to be the most critical) was assigned a colour code of red. This colour coding created a visual display that would allow the HF Analyst to visually identify the concentration of Critical Goals as they occurred in the mission. These concentrations of critical goals (often the largest concentration of red within the OSDs) were then identified and labelled as critical mission segment. Each critical mission segment was then assigned a title and is explained in greater detail in the next section of this report, Information Flow and Processing.

Information Flow and Processing Analysis

A review of the four operational sequence diagrams easily identified six critical mission segments. Each critical mission segment was annotated with an enclosed blue box and clearly labelled with a name and segment number. The following is a list of each of the Critical Mission Segments and the Critical Mission Segment Number:

1. Critical Mission Segment #1 – **Evade Air Threat During Low Level Ingress** (SU-27)

   Part of OSD #2, Section 7.2, Conduct Air Interdiction

2. Critical Mission Segment #2 – **General Purpose Bomb Attack** (Daytime)

   Part of OSD #2, Section 7.2, Conduct Air Interdiction

3. Critical Mission Segment #3 – **Evade Threat (SA-8) During Medium Level Ingress** (Night)

   Part of OSD #3, Section 7.2, Conduct Night BAI

4. Critical Mission Segment #4 – **GPS Guided Bomb Attack** (Night)

   Part of OSD #3, Section 7.2, Conduct Night BAI

5. Critical Mission Segment #5 – **Self-Lasing Guided Bomb Attack** (Night)

   Part of OSD #4, Section 7.3, Conduct Night OAS/CAS

6. Critical Mission Segment #6 – **Maverick Air to Ground Missile Attack** (Night)

   Part of OSD #4, Section 7.3, Conduct Night OAS/CAS

The database was updated to indicate the goals contained within the critical mission segments as well as all the continuous and repeating goals from the top of each OSD that were active during the mission segment. There were 130 unique goals identified that fit these criteria. Of these goals, many were repeated throughout the Critical Mission Segment therefore the actual number of goals within all the segments was much higher. Each of these goals was then populated with the Information Processing (IP) and Perceptual Control Theory (PCT) data required for modelling within the IPME application. The Microsoft Access Database provided as GFI for this project was used to populate the IP/PCT data. A detailed description of the methodology is contained within the Perceptual Control Theory Approach to Human Systems Analysis Summary Report prepared for DCIEM by BAE Systems Canada [Reference 3]. A detailed description of the Information Processing Model and the data requirements within IPME is contained within the IPME Version 1.10 Reference Manual, Chapter 13, Information Processing Model [Reference 4].

The following Goal-Level IP Model Parameters were generated for all goals as required for the IP/IPME modelling environment:

IP Components:

a. **IP No**.—Modeled within IPME only. The IP No. represented within the database is a mapping number to indicate the Goal that the IPME task maps to within the Microsoft Access Database;
b. **Operator**—All the operators in this analysis were pilots. The goals as described in the Microsoft Access Database are independent of the individual aircraft being flown. Within IPME, the goals were duplicated and an assignment to the Lead Aircraft, Number 2, Number 3 or Number 4 Aircraft was made.
c. **Goal Label** —a narrative description of the goal.
d. **Goal Completion Time**—the mean time to complete the task or accomplish the goal/objective. No time distribution was used on this project, only the mean time.
e. **Auditory Category**—an assignment of the auditory nature of the task/goal/objective for use in identifying task interference within the IP/IPME performance prediction analysis environment;
f. **Externally Cued**?—a yes/no/not applicable indication of external task cueing;
g. **Cognitive Category**—an assignment of the cognitive nature of the task/goal/objective for use in identifying task interference within the IP/IPME performance prediction analysis environment;

IP Scheduling:

a. **Scheduling and Priority Category**—an assignment of the priority (and related parameters including allowable delay and degree of difficulty) of the task/goal/objective in accordance with the IPME Version 1.10 Reference manual p.13-16 [Reference 4];
b. **Allowable Delay** – the allowable delay (K) value which defines the allowable delay as a multiplier of the mean goal time;
c. **Degree of Difficulty**- used for continuous goals where the degree of difficulty (D) is defined as a percentage of the total goal time where the goal is being attended;
d. **Interruptable?**—a yes/no indication of whether or not the task can be interrupted;
e. **Resumable**?—a yes/no indication of whether the task can be resumed after having been interrupted (without additional workload);
f. **Sheddable?**—a yes/no indication of whether or not the tasks can be shed; and
g. **Shed if Late**?—a yes/no indication of whether the task is to be shed rather than starting late.

An Information Flow and Processing Analysis was conducted on the selected Critical Mission Segments. This is not a traditional Information Flow and Processing Analysis that would be used to analyze the Critical Mission Segments as a whole but rather an analysis that identifies all the PCT data required for each goal within each Mission Segment. This analysis is based upon the methodology and data entry fields used in the Perceptual Control Theory Approach to Human Systems Analysis Summary Report prepared for DCIEM by BAE Systems Canada [Reference 3]. The key difference between a traditional Information Flow and Processing Analysis and the PCT based analysis is that the PCT analysis looks at each goal separately rather

than looking at the Critical Mission Segment as a whole. This gives a fine degree of resolution for the analysis but does not provide the 'big picture' of how information flows through the segment. A traditional Information Flow and Processing Analysis also looks at other criteria such as consequences of error and impact on situational awareness.

The following data was generated for all goals as required for the PCT analysis:

a. **Data Common to IP/IPME**—various data common to both the IP/IPME and the PCT analysis including IP No., goal/objective, task description, operator assignment, and link to the corresponding Access Database No., if different;
b. **Initiating Conditions**—a narrative description of the conditions that would cause the goal to be attended (i.e. the goal has not been achieved, error (e) .0);
c. **Initiating Action**—a narrative description of the actions to be taken in attending to the goal;
d. **Ending Conditions**—a narrative description of the conditions that would cause attendance of the goal to be terminated (i.e. the goal has been achieved, e=0);
e. **Ending Actions**—a narrative description of the actions to be taken when the goal has been achieved;
f. **Knowledge**—narrative descriptions of declarative and situation knowledge requirements for attending to the goal;
g. **Output/Behaviour**—an assignment of the human behaviours, and related cognitive/perceptual process categories, for goal attendance;
h. **Input/Sensation**—an assignment of the input sensations, and related cognitive/perceptual process categories, for assessing goal achievement;
i. **Influenced Variables (External)**—a listing of the external variables within the control loop that the operator affects while attending to the goal (external variables are observable by a third party);
j. **Output Interface**—a listing of the interfaces the operator uses to interact with the external world;
k. **Influenced Variables (Internal)**—a description of the operator's perception as to whether the goal has been achieved or not (internal variables are not observable by a third party);
l. **Output Interface**—a listing of the interfaces which influence the operator's perception as to whether or not the goal has been achieved; and
m. **Feedback to higher-level goals**?—a yes/no indication of whether the achievement of the goal influences one or more higher level goals.

The completed database and the OSDs were used by Micro Analysis and Design to build the network model within IPME. One of the aims of this contract was to provide a populated network model within the IPME application in order to facilitate further research on the CF18 in the air to ground role. As the focus was exclusively on data population, no effort was made to model all the interdependencies required to create a fully functional model. Because the model is not fully functional, there was no opportunity to perform any analysis of the data or to verify the data integrity with IPME. This activity has been identified as an optional work package that would be exercised at a later time.

Conclusion

A complete Mission, Function and Goal Analysis was conducted and a populated data model was developed within IPME. The project was completed under an extremely aggressive schedule of just 40 working days. The ability to re-use much of the information provided by DCIEM to The HFE Group team along with a very focussed methodology allowed the project to be completed on time. Because of the time restriction imposed on the program, the analysis does not cover the wide scope of a traditional Mission, Function and Task Analysis nor does the documentation provide an exhaustive description of methodology. What the project does provide, is an in depth analysis of the most critical mission segments with a solid base of data within IPME to continue future work.

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6. System Operator Loading Evaluation, Methodology Documentation, Canadian Marconi Company, Reference Number RAE1 c/299, 8 January 1993

7. Statement of Work, For a CF188 APG Radar Human Factors Engineering Study, 17 August 1999.

8. CF188 APG-65 Radar Human Factors Engineering Study, Program Management Plan, 19 February 2000.

9. MIL-HDBK-46855, Human Engineering Requirements for Military Systems, Equipment and Facilities.

10. Omnibus CF-18 Incremental Modernization Project Statement of Operational Requirement, March 2000.

11. The (CF-18) Fighter Pilot Training Directive 2000, February 2000.

12. Chief of the Air Staff Planning Guidance 2000, Fall, 1999.

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14. January 1993. 8. CF-18A/CF-18B, Aircraft Operating Instructions, Canadian Forces Technical Orders (CFTO) C-12-188-NFM-MB-001/002.

15. CF-18A/CF-18B Pilot's Weapons Checklist, CFTO C-12-188-NFM/MC-004.

16. CF-188 Course Training Standard (CTS) for CF-188 Pilot Training, A-P8-032- 188/PC-D08, 1999.

17. CF-188 Flying Training Manual/How to Fly Manual, 1999.

18. CF-188 Mission Briefing Guide, 1999.

19. CF-188 Weapons System Trainer (WST) Mission Briefing Guide, 1999.

Annex A

Glossary

Glossary

24/7	24 hours a day, 7 days a week
AAR	Air-to-Air Refuelling
AC	Alternating Current
ACDVS	Aircrew Chemical Defence Ventilator System
ACM	Air Combat Manoeuvring
ACM	Airspace Control Measures
AGL	Above Ground Level
ALSE	Advanced Life Support Equipment
AMIRS	Advanced Multi-Role Infrared Sensor
AMLCD	Active Matrix Liquid Crystal Display
AMRAAM	Advanced Medium Range Air-to-Air Missile
AOB/GOB/EOB	Air, Ground and Electronic Orders of Battles
AST	Air-to-Surface Tactics
AWACS	Airborne Warning and Control System
BCA	Border Crossing Authority
BDA	Bomb Damage Assessment
BST	Boresight Mode
CAMAO	Combined Allied Military Air Operation
CF	Canadian Forces
CFIT	Controlled Flight Into Terrain
CONOPS	CONcept of OPerationS
CR	Combat Ready
D/L	Data Link
DAR	Directorate of Air Requirements
DC	Direct Current
DCS	Digital Communication System
DDIs	Digital Display Indicators
DEWS	Defensive Electronic Warfare Suite
DFFG	Deep Fathom Fishing Grounds
DND	Department of National Defence
ECCM	Electronic Counter Counter Measures
ECCM	Electronic Counter-Counter Measures

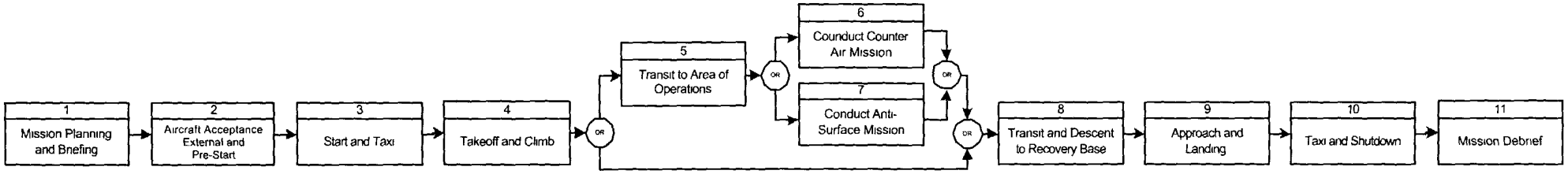
ECS	Environmental Control System
EGI	Embedded Global Positioning/Inertial Navigation System
EGR	Embedded GPS Receiver
ELE	Estimated Life Expectancy
F/A	Fighter Attack
FAOR	Fighter Area of Operational Responsibility
FLIR	Forward Looking InfraRed
FPTD	Fighter Pilot Training Directive
FSU	Former Soviet Union
GP	General Purpose
GPWS	Ground Proximity Warning System
HFE	Human Factors Engineering
HMD	Helmet Mounted Display
HOBS	High Off Boresight System
HOTAS	Hands-On-Throttle-And-Stick
HSD	Horizontal Situation Display
HUD	Heads-Up Display
HVAA	High Value Airborne Asset
IAD	Integrated Air Defence (IAD) System and SAM: SA-6, SA-7, SA-8, SA-11, SA-13, SA-14 and SA-16
IFR	Instrument Flight Rules
IMP	Incremental Modernization Project
INS	Inertial Navigation System
IR	InfraRed
JDAM	Joint Direct Attack Munition
JSOW	Joint Stand Off Weapon
LGB	Laser Guided Bombs
LST	Laser Spot Tracker
MCs	Mission Computers
MDG	Multi-purpose Display Group
MDLS	Mission Data Loading System
MFFOs	Mixed Fighter Force Operations
MIDS	Multi-functional Information Distribution System
MILSATCOM	Military Satellite Communications

MOEs	Measures of Effectiveness
MRI	Multiple, Release, and Interval
MSI	Multi-Sensor Integration
NATO	North Atlantic Treaty Organization
NCTR	Non-Cooperative Target Recognition
nm	Nautical miles
NORAD	North American Air Defence
NVGs	Night Vision Goggles
NVIS	Night Vision Imaging Systems
OAS	Offensive Air Support
OEM	Original Equipment Manufacturer
OFP	Operational Flight Program
OPFOR	OPposing FORces
OSDs	Operational Sequence Diagrams
PC	Personal Computer
PGMs	Precision Guided Munitions
PPS	Precise Positioning Service
psi	pounds per square inch
PSKE	Pilot Skill and Knowledge Element
PSKL	Pilot Skill and Knowledge Level
PTLL	Pilot Tactical Leadership Level
PWGSC	Public Works and Government Services Canada
RAF	Royal Air Force
RNLAF	Royal Netherlands Air Force
ROE	Rules Of Engagement
RV	RendezVous
RWR	Radar Warning Receiver
RWS	Range While Search
SAM	Surface-to-Air Missile
SAR	Semi Active Radar
SLOC	Sea Lines Of Communication
SMS	Stores Management Set
SOW	Statement Of Work
SPS	Standard Positioning Service

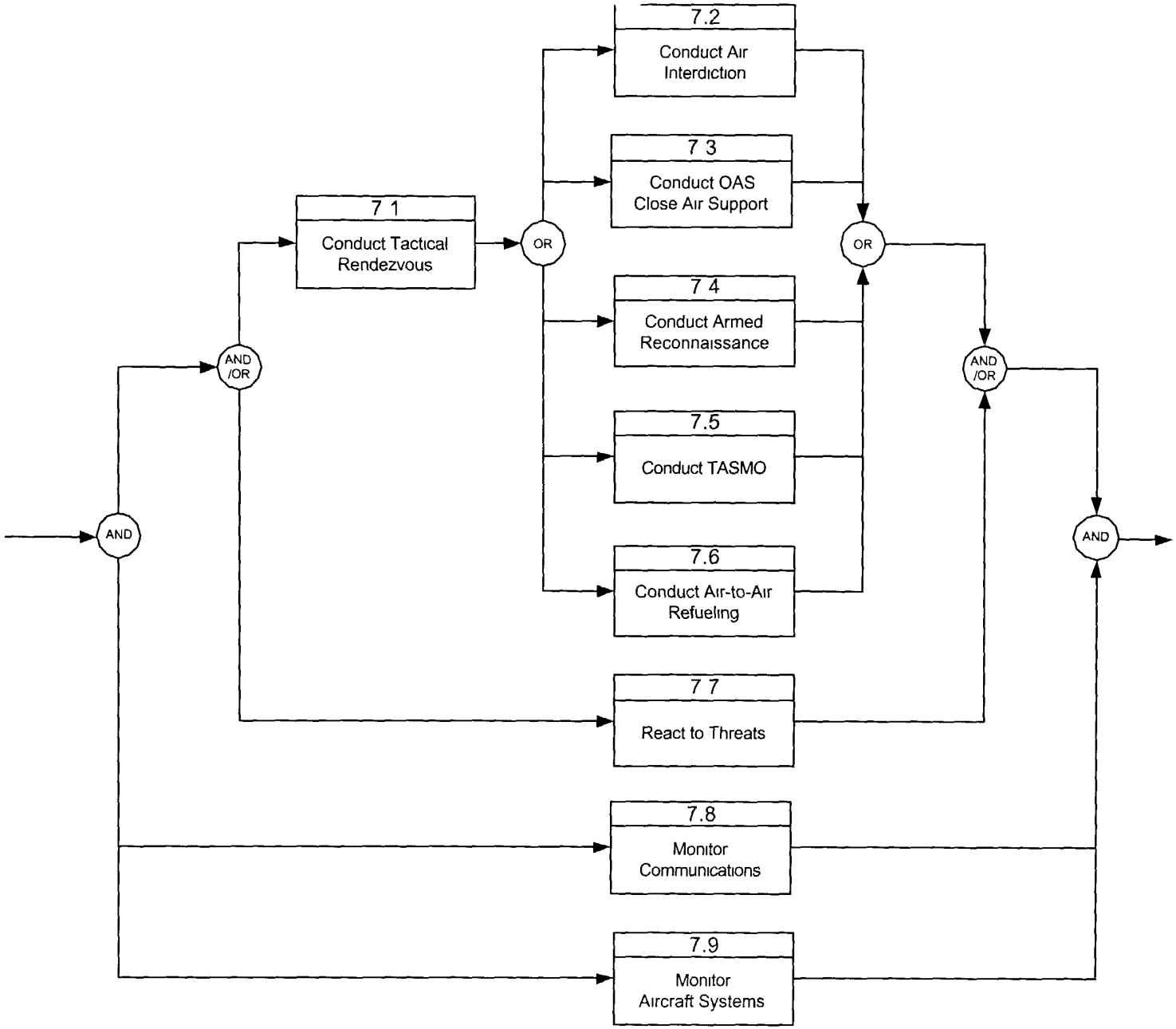
SRAAM	Short Range Air-to-Air Missile
STT	Single Target Track
SVs	space vehicles
TAOC	Tactical Air Operations Centre
TCCCS	Tactical Command, Control and Communication System
TRP	Tactical Rendezvous Point
TWS	Track While Scan
UFC	Up-Front Controller
UN	United Nations
USMC	United States Marine Corps
USN	United States Navy
VACQ	Vertical Acquisition Modes
VS	Velocity Search
WACQ	Wide Acquisition
WYSIWYG	What You See Is What You Get
XEFZ	Xarian Economic and Fishing Zone
YFR	Yearly Flying Rate

Annex B

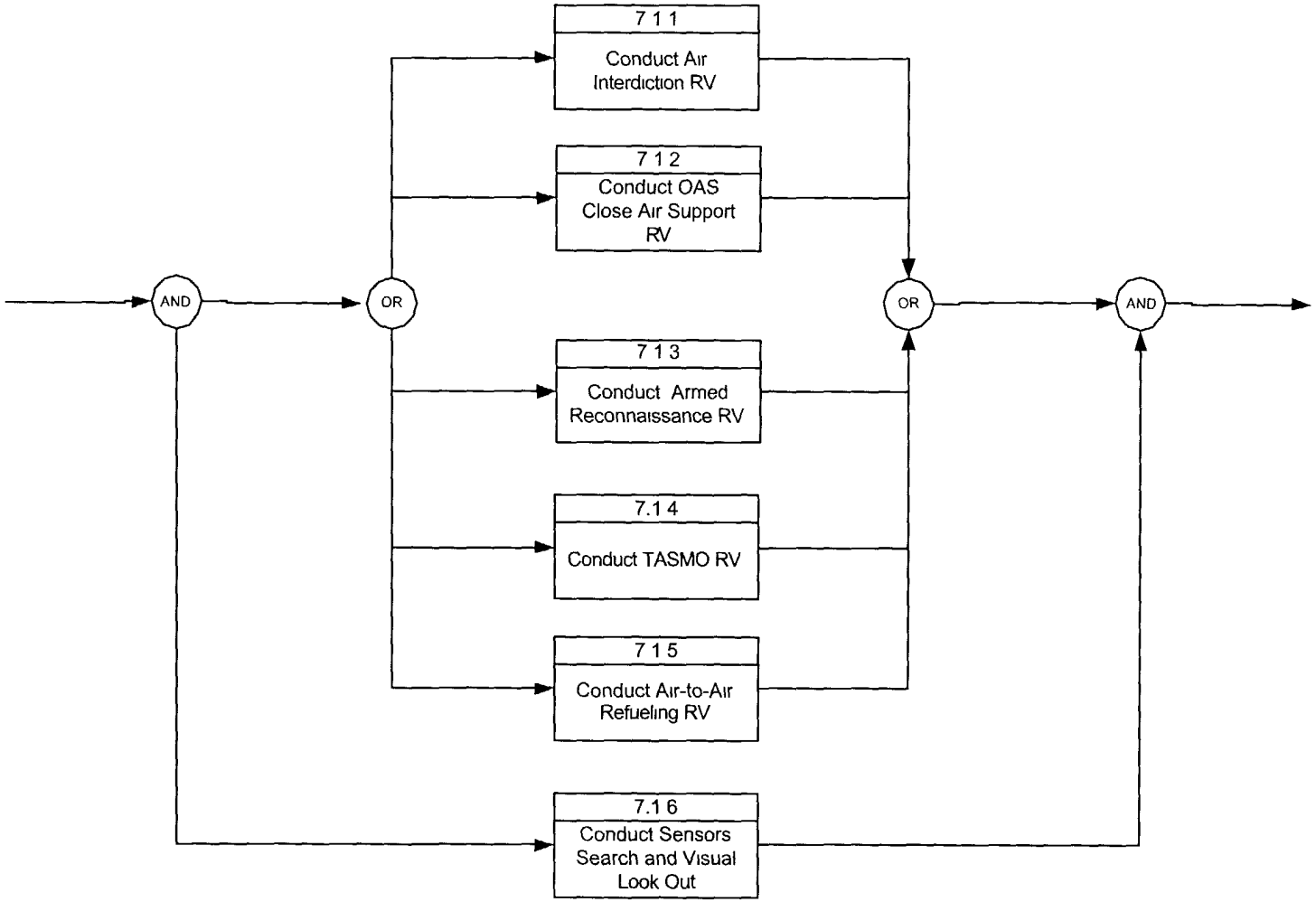
Function Flow Diagrams



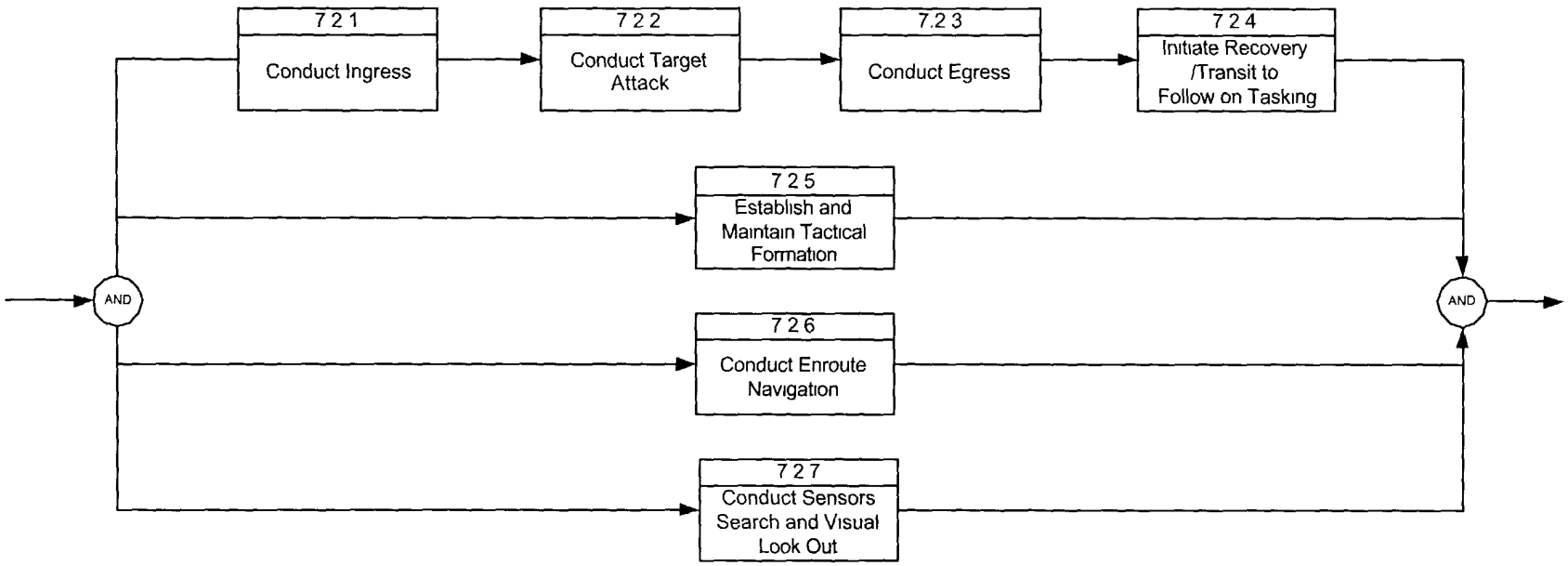
CF188 Top Level



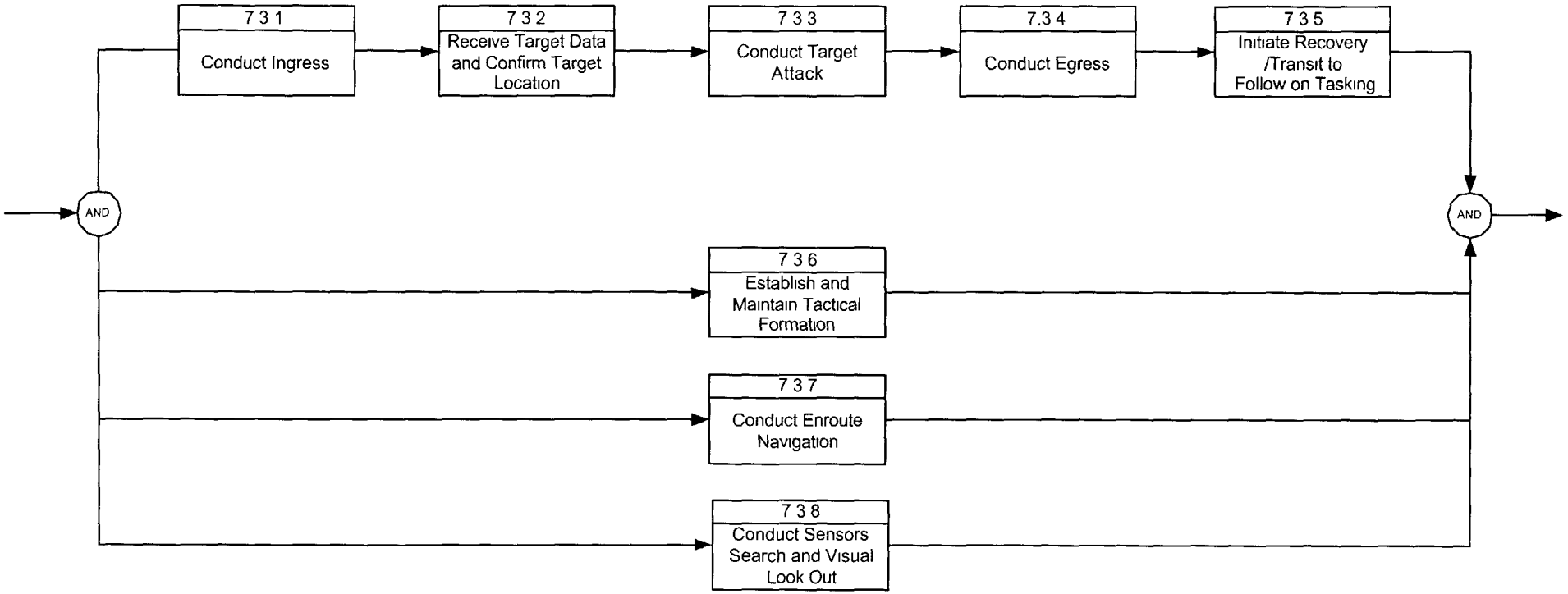
Section 7 Conduct Anti-Surface Mission



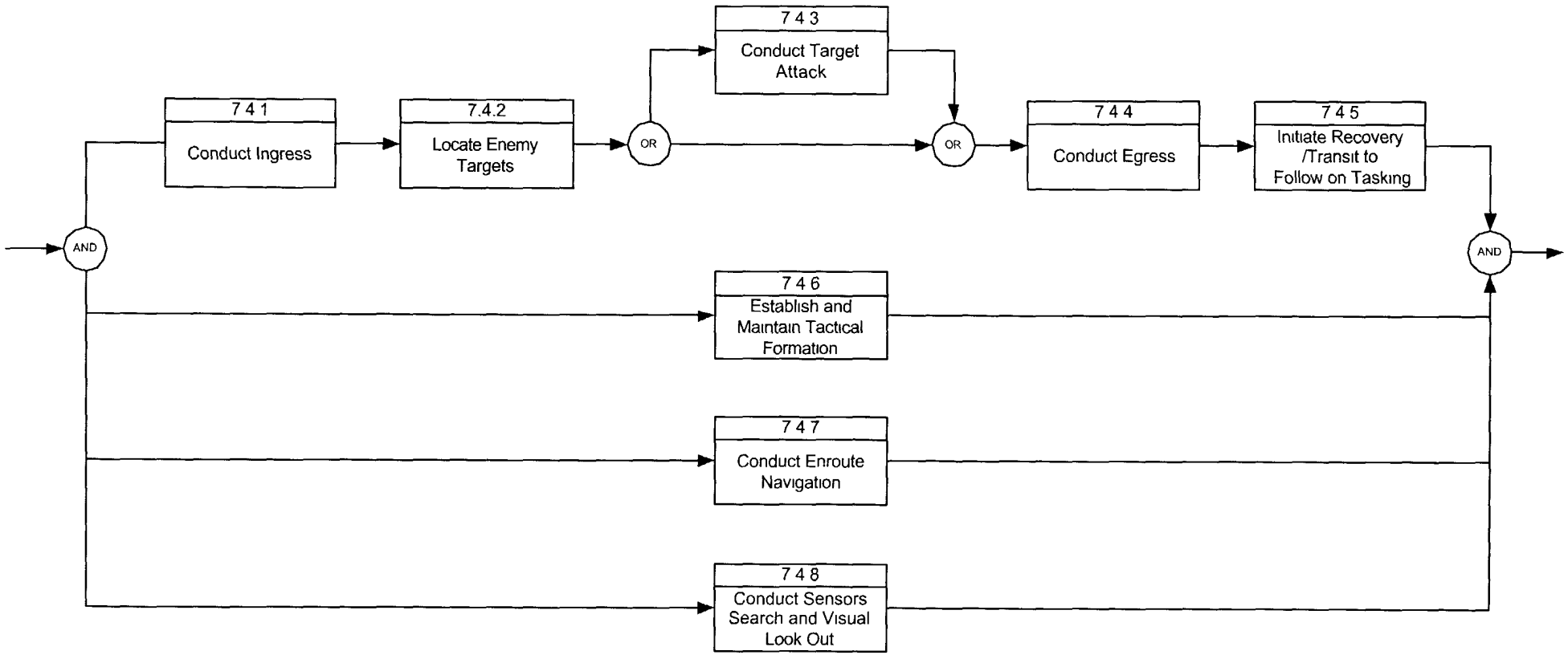
Segment 7.1 Conduct Tactical Rendezvous



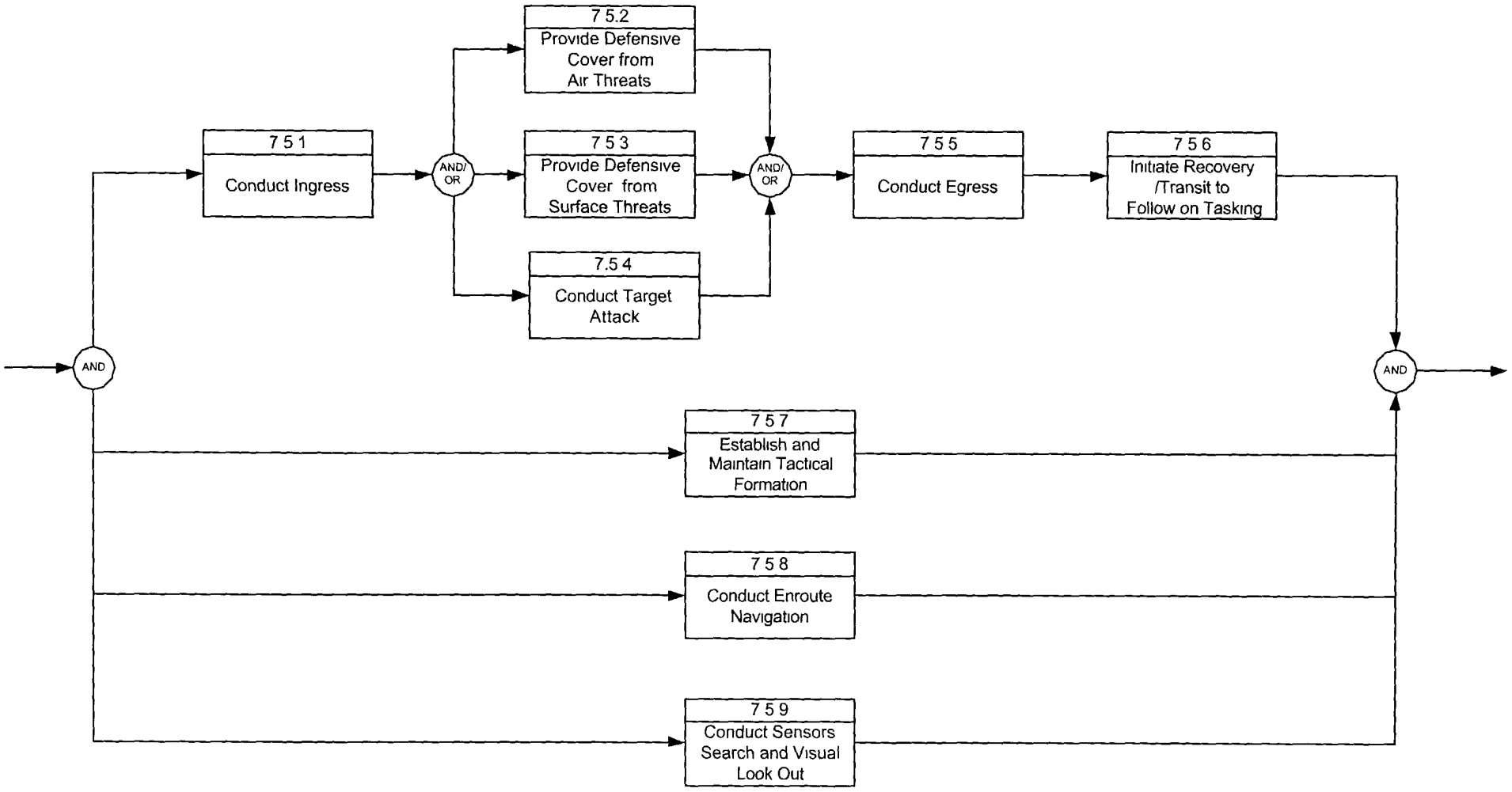
Segment 7.2 Conduct Air Interdiction



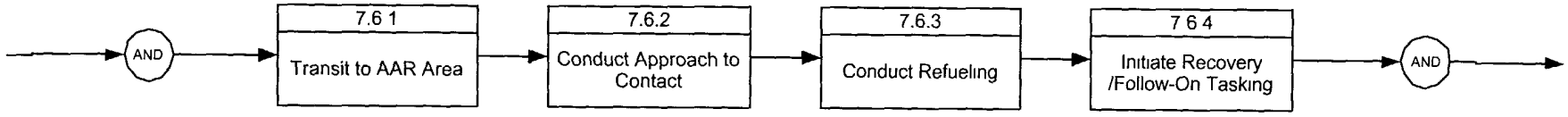
Segment 7.3 Conduct OAS Close Air Support



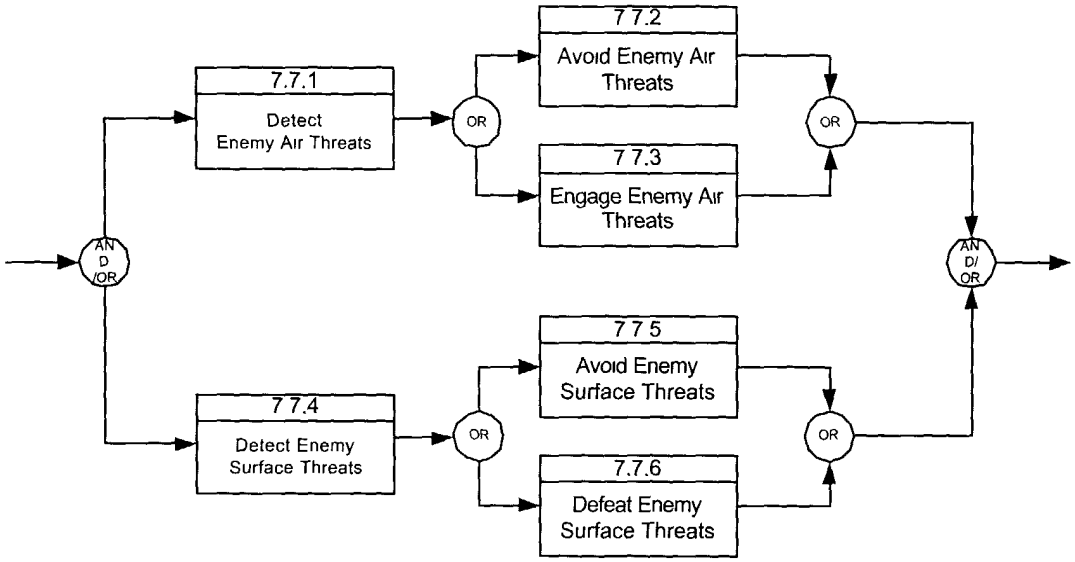
Segment 7.4 Conduct Armed Reconnaissance



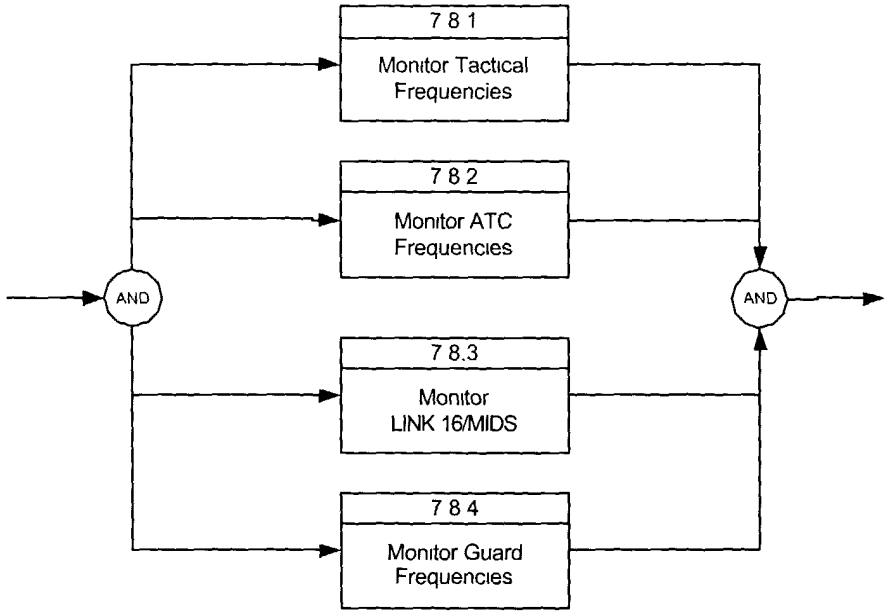
Segment 7.5 Conduct Tactical Air Support of Maritime Operations (TASMO)



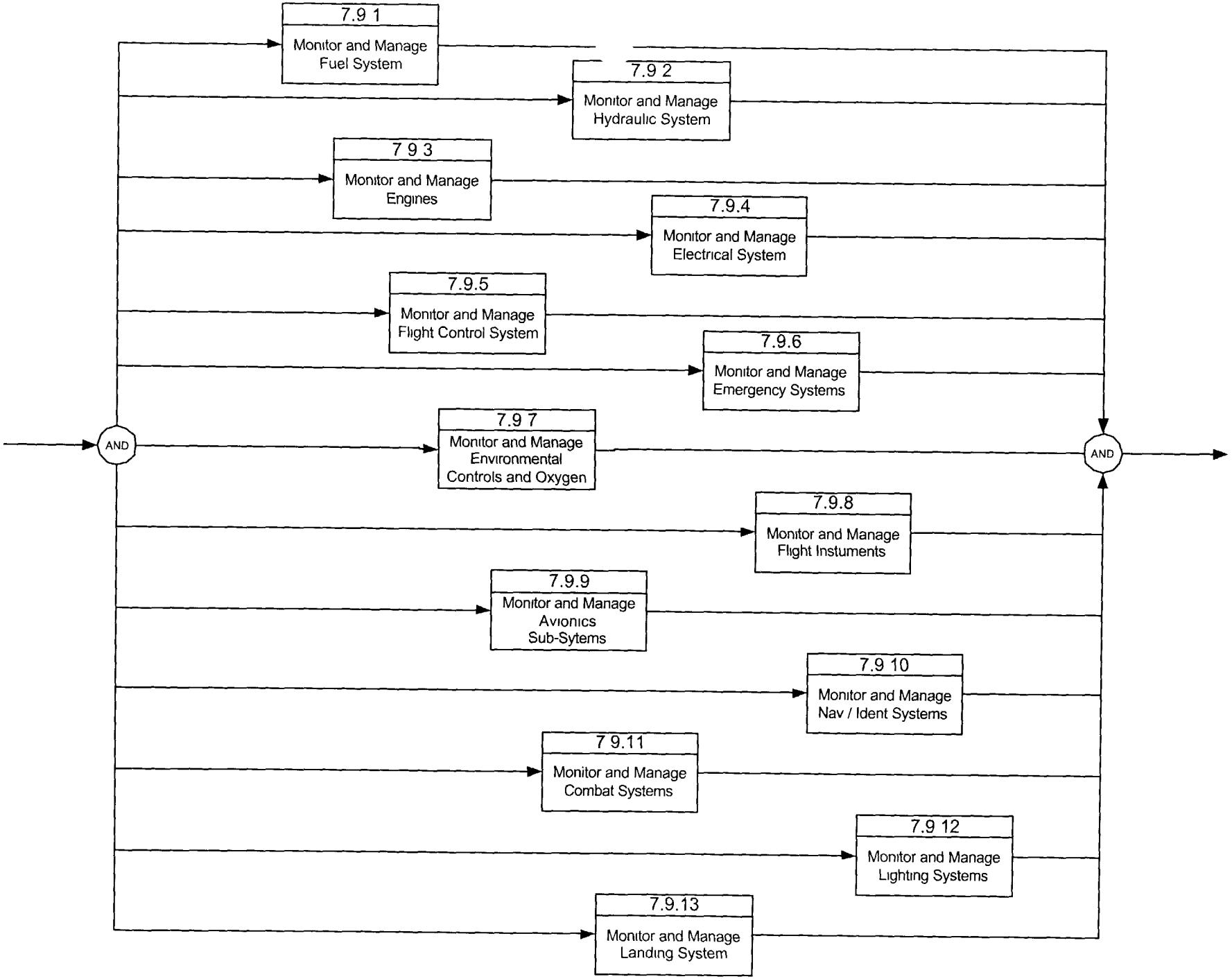
Segment 7.6 Conduct Air-to-Air Refueling



7.7 React to Threats



Segment 7.8 Monitor Communications



Segment 7.9 Monitor and Manage Aircraft Systems

Annex C

Goal Inventory

Annex C - CF18 Air to Ground Goal Inventory

7			**Conduct Anti-Surface Mission**
7.1			**Conduct Tactical Rendezvous**
7.1.1			**Conduct Air Interdiction RV**
7.1.1.1			**Establish Hold at TRP**
	7.1.1.1(a)	7.1.1.1(a)	Identify TRP
	7.1.1.1(b)	7.1.1.1(b)	Conduct TRP Hold
	7.1 1 1(c)	7.1.1.1(c)	Search for TRP
7.1.1.2			**Establish Contact**
	7.1.1.2(a)	7.1.1.2(a)	Establish Radar Contact with Other Mission Elements
	7.1.1.2(b)	7.1.1.2(b)	Establish Communications with Other Mission Elements
	7.1.1.2(c)	7.1.1.2(c)	Establish Communications with Controlling Agency
	7.1 1.2(d)	7.1.1.2(d)	Get Tactical Update and Area Brief
	7.1.1.2(e)	7.1.1.2(e)	Confirm Friendly Force and Adversary Disposition on LINK 16/MI
	7.1.1.2(f)	7.1.1.2(f)	Establish Visual Contact with Other Mission Elements
	7.1.1.2(g)	7.1.1.2(g)	Establish AMIRS Contact with Other Mission Elements
	7.1.1.2(h)	7.1.1.2(h)	Establish NVG Contact with Other Mission Elements
7.1.1.3			**Conduct RV**
	7.1.1.3(a)	7.1.1.2(a)	Establish Radar Contact with Other Formation Members
	7.1.1.3(b)	7.1.1.2(b)	Establish Communications with Other Formation Members
	7.1.1.3(c)	7.1.1.3(c)	Conduct Formation Join-up
	7.1.1.3(d)	7 1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
	7.1.1.3(e)	7.1.1.2(f)	Establish Visual Contact with Other Formation Members
	7.1.1 3(f)	7 1.1.2(g)	Establish AMIRS Contact with Other Formation Members
	7.1.1.3(g)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members
	7.1.1.3(h)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position
7.1.2			**Conduct OAS Close Air Support RV**
7.1.2.1			**Establish Contact**
	7.1.2.1(a)	7.1.1.2(a)	Establish Radar Contact with Other Mission Elements
	7.1.2.1(b)	7.1.1.2(c)	Establish Communications with Controlling Agency (ABCCC/AWA
	7.1.2.1(c)	7.1.1 2(b)	Establish Communications with Forward Air Controller (FAC)
	7.1.2.1(d)	7.1.1.2(d)	Get Tactical Update and Area Brief
	7.1.2.1(e)	7.1.2.1(e)	Get Initial Target Brief
	7.1.2.1(f)	7.1.1.2(f)	Establish Visual Contact with Other Mission Elements
	7.1.2.1(g)	7.1.1 2(g)	Establish AMIRS Contact with Other Mission Elements
	7.1.2.1(h)	7.1 1.2(h)	Establish NVG Contact with Other Mission Elements
7.1.2.2			**Conduct RV**
	7.1.2.2(a)	7.1.1.2(a)	Establish Radar Contact with Other Formation Members

7.1.2.2(b)	7.1.1.2(b)	Establish Communications with Other Formation Members
7.1 2.2(c)	7.1.1.3(c)	Conduct Formation Join-up
7.1.2.2(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7.1 2.2(e)	7.1.1 2(f)	Establish Visual Contact with Other Formation Members
7.1.2.2(f)	7.1.1.2(g)	Establish AMIRS Contact with Other Formation Members
7.1.2.2(g)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members
7.1.2.2(h)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position

7.1.3 Conduct Armed Reconnaissance RV

7.1.3.1 Establish Hold at TRP

7.1.3.1(a)	7.1 1 1(a)	Identify TRP
7.1.3 1(b)	7 1.1.1(b)	Establish TRP Hold
7 1.3.1(c)	7.1.1.1(c)	Search for TRP

7.1.3.2 Establish Contact

7.1.3.2(a)	7 1.1.2(a)	Establish Radar Contact with Other Mission Elements
7.1.3 2(b)	7.1 1.2(b)	Establish Communications with Other Mission Elements
7.1.3.2(c)	7.1.1.2(c)	Establish Communications with Controlling Agency
7.1.3.2(d)	7.1.1.2(d)	Get Tactical Update and Area Brief
7.1.3.2(e)	7.1.1.2(e)	Confirm Friendly Force and Adversary Disposition on LINK 16/MI
7.1.3.2(f)	7.1.1.2(f)	Establish Visual Contact with Other Mission Elements
7.1.3.2(g)	7.1.1.2(g)	Establish AMIRS Contact with Other Mission Elements
7.1.3.2(h)	7.1.1.2(h)	Establish NVG Contact with Other Mission Elements

7.1.3.3 Conduct RV

7.1.3.3(a)	7 1.1.2(a)	Establish Radar Contact with Other Formation Members
7.1.3.3(b)	7.1.1.2(b)	Establish Communications with Other Formation Members
7 1.3.3(c)	7.1 1.3(c)	Conduct Formation Join-up
7.1.3.3(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7 1.3.3(e)	7.1.1.2(f)	Establish Visual Contact with Other Formation Members
7.1.3.3(f)	7.1.1.2(g)	Establish AMIRS Contact with Other Formation Members
7.1.3.3(g)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members
7.1.3.3(h)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position

7.1.4 Conduct TASMO RV

7.1.4.1 Establish Contact

7.1.4.1(a)	7.1.1.2(a)	Establish Radar Contact with Other Mission Elements
7.1.4.1(b)	7.1 1.2(b)	Establish Communications with Other Mission Elements
7.1.4.1(c)	7.1.4.1(c)	Conduct Weapons Check-In with Controlling Agency
7.1.4.1(d)	7 1.1.2(d)	Get Tactical Update and Area Brief
7 1.4.1(e)	7.1.1.2(e)	Confirm Friendly Force and Adversary Disposition on Link 16/MID
7.1.4.1(f)	7.1.4.1(f)	Confirm Positive Radar Identification by Naval Controlling Agency

7.1 4.1(g)	7.1 1.2(f)	Establish Visual Contact with Other Mission Elements
7.1.4.1(h)	7.1.1.2(g)	Establish AMIRS Contact with Other Mission Elements
7.1.4.1(i)	7.1.1.2(h)	Establish NVG Contact with Other Mission Elements

7.1.4.2 Conduct RV

7 1.4 2(a)	7.1.1.2(a)	Establish Radar Contact with Other Formation Members
7.1.4.2(b)	7.1.1.2(b)	Establish Communications with Other Formation Members
7 1.4.2(c)	7.1.1.3(c)	Conduct Formation Join-up
7 1.4 2(d)	7 1.1 3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7.1.4 2(e)	7.1.4.2(e)	Establish Radar Contact with Naval Ships
7 1.4.2(f)	7 1.4.2(f)	Deploy to CAP
7 1.4.2(g)	7.1.4.2(g)	Establish Visual Contact with Naval Ships
7.1.4.2(h)	7.1.1.2(g)	Establish AMIRS Contact with Other Formation Members
7.1 4.2(i)	7.1 4.2(i)	Establish AMIRS Contact with Naval Ships
7.1.4.2(j)	7.1.1.2(f)	Establish Visual Contact with Other Formation Members
7.1.4.2(k)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members
7.1.4.2(l)	7.1 4.2(l)	Establish NVG Contact with Naval Ships
7.1.4 2(m)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position

7.1.5 Conduct Air-to Air Refueling RV

7.1.5.1 Establish Contact

7.1.5.1(a)	7.1.1.2(e)	Confirm Friendly Force and Adversary Disposition on LINK 16/MI
7.1.5.1(b)	7 1.5.1(b)	Establish Radar Contact with AAR
7.1 5.1(c)	7.1 5.1(c)	Establish Communications with AAR
7 1.5.1(d)	7 1.5.1(d)	Conduct Pre AAR RV Checks
7.1.5.1(e)	7.1.5.1(e)	Establish Visual Contact with AAR
7.1.5.1(f)	7.1.5.1(f)	Establish AMIRS Contact With AAR
7.1.5.1(g)	7.1.5.1(g)	Establish NVG Contact with AAR

7.1.5.2 Conduct Formation Join Up

7.1.5.2(a)	7.1.5.2(a)	Conduct AAR Sensors to Visual Intercept
7.1 5.2(b)	7.1.5.2(b)	Adopt AAR Towline Waiting Position
7.1.5.2(c)	7.1.5.2(c)	Join In Echelon Position
7.1 5.2(d)	7.1.5.2(d)	Position Astern AAR Hoses
7.1.5.2(e)	7.1.5.2(e)	Conduct Pre-Contact AAR Checks
7.1.5.2(f)	7.1.5.2(f)	Conduct AAR Sensors to NVG Intercept
7 1.5.2(g)	7.2.5 1(b)	Maintain Aircraft Control and Flight Position

7.1.6 Conduct Sensors Search and Visual Look Out

7.1.6.1 Conduct Radar Search and Surveillance

7.1 6.1(a)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters
7.1.6 1(b)	7.2.7.1(b)	Monitor and Maintain Radar Contact with Formation Members

7.1.6 1(c)	7 2.7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements
7.1.6.1(d)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns
7.1.6.1(e)	7.2.7.1(e)	Advise on Radar Acquired Unknowns
7.1.6.1(f)	7.2.7.1(f)	Radar Sort Multiple Unknown Contacts
7 1 6.1(g)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF
7.1.6.1(h)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays

7.1.6.2 Conduct AMIRS Search and Surveillance

7.1.6.2(a)	7.2.7 2(a)	Monitor and Maintain Assigned AMIRS Search Parameters
7.1.6.2(b)	7.2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members
7.1 6 2(c)	7.2.7.2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elemer
7.1.6 2(d)	7 2.7.2(d)	Monitor and Maintain AMIRS Contact with Unknowns
7.1.6.2(e)	7.2.7.2(e)	Advise on AMIRS Acquired Unknowns
7.1 6.2(f)	7.2.7 2(f)	Sort Multiple Unknown Contacts with AMIRS
7.1.6.2(g)	7.2.7.2(g)	Interrogate Unknown AMIRS Contacts with IFF

7.1.6.3 Conduct Visual Search and Surveillance

7 1.6.3(a)	7.2.7.3(a)	Maintain Visual Search Patterns
7 1.6.3(b)	7.2.7.3(b)	Monitor and Maintain Visual Contact with Formation Members
7.1 6 3(c)	7.2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element
7.1.6.3(d)	7.2.7.3(d)	Monitor and Maintain Visual Contact with Unknowns
7.1.6.3(e)	7.2.7.3(e)	Advise on Visually Acquired Unknowns
7.1.6.3(f)	7 2.7.3(f)	Maintain NVG Visual Search Patterns
7.1 6.3(g)	7.2.7.3(g)	Monitor and Maintain NVG Contact with Formation Members
7.1.6 3(i)	7.2.7.3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements
7.1.6.3(j)	7.2.7.3(i)	Monitor and Maintain NVG Contact with Unknowns

7.2 Conduct Air Interdiction

7.2.1 Conduct Ingress

7.2.1.1 Perform FLOT Crossing Procedures

7.2.1.1(a)	7.2.1 1(a)	Reduce Aircraft Emissions (EMCON Procedures)
7.2.1.1(b)	7.2.1.1(b)	Ingress at Low Altitude (Sophisticated Environment)
7 2.1.1(c)	7.2.1.1(c)	Ingress at Medium/High Altitude (Permissive Environment)
7.2.1.1(d)	7.2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)
7.2.1.1(e)	7.2.1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)

7.2.2 Conduct Target Attack

7.2.2.1 Conduct General Purpose (GP) Bomb Attack

7.2.2.1(a)	7.2.2.1(a)	Conduct A/G Check
7.2.2.1(b)	7.2.2.1(b)	Identify Initial Point Visually
7 2.2.1(c)	7.2.2.1(c)	Designate/Add Offset at Initial Point
7.2.2.1(d)	7 2.2.1(d)	Manoeuvre to Weapons Delivery Parameters
7.2.2 1(e)	7.2.2 1(b)	Identify Target/DMPI Visually

7.2.2.1(f)	7.2.2.1(f)	Conduct Element Split Attacks
7.2.2.1(g)	7.2.2.1(g)	Validate Weapons Solution Display
7 2.2.1(h)	7.2.2.1(h)	Deliver GP Weapons(Bombs/Rx/Cluster/Gx)
7.2 2.1(i)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre
7.2.2.1(j)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre
7.2.2.1(k)	7.2.2.1(k)	Conduct BDA
7.2.2.1(l)	7.2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections
7.2 2.1(m)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays
7.2.2 1(n)	7.2.2.1(n)	Search for Initial Point
7.2.2.1(o)	7.2 2.1(o)	Search for Target
7.2.2.1(p)	7.2.2.1(p)	Identify Initial Point with NVG
7.2.2.1(q)	7.2.2.1(p)	Identify Target/DMPI with NVG

7.2.2.2 Conduct Precision Guided Munitions (PGM) Attack

7.2.2.2(a)	7.2.2.1(a)	Conduct A/G Check
7.2.2 2(b)	7.2.2.2(b)	Designate Target Position
7.2.2.2(c)	7 2.2.2(c)	Identify Target Area with Aircraft Sensors
7.2.2 2(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters
7.2.2.2(e)	7.2 2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16
7.2.2.2(f)	7.2.2.1(g)	Validate Weapons Solution Display
7.2.2.2(g)	7.2.2.2(g)	Deliver PGM (LGB/MAV/Adv PGM)
7.2.2.2(h)	7.2.2.2(h)	Conduct Self-Lasing LGB Delivery
7.2.2.2(i)	7.2.2.2(i)	Conduct Buddy-Lasing LGB Delivery
7.2.2.2(j)	7.2.2 2(j)	Update Target Designation
7.2.2.2(k)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre
7.2.2.2(l)	7.2.2.1(k)	Conduct BDA
7.2.2.2(m)	7.2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections
7 2.2.2(n)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays
7 2.2.2(o)	7.2.2 1(j)	Conduct Frag Avoidance Manoeuvre

7.2.3 Conduct Egress

7.2.3.1 Perform Formation Rejoin

7.2.3.1(a)	7.1.1.2(a)	Establish Radar Contact with Other Formation Members
7.2.3.1(b)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7.2 3.1(c)	7.1.1.3(c)	Conduct Formation Join-up
7.2 3.1(d)	7.1.1.2(f)	Establish Visual Contact with Other Formation Members
7.2.3.1(e)	7.1.1.2(g)	Establish AMIRS Contact with Other Formation Members
7.2.3.1(f)	7 1.1.2(h)	Establish NVG Contact with Other Formation Members

7.2.3.2 Perform FLOT Crossing Procedures

7.2.3.2(a)	7.2.1.1(a)	Allow Aircraft Emmisions for Identification

7.2 3.2(b)	7 2.3.2(b)	Egress at Low Altitude
7.2.3.2(c)	7.2.3.2(c)	Egress at Medium/High Altitude
7.2 3.2(d)	7.2.3.2(d)	Conduct Lame Duck Procedures
7 2.3.2(e)	7.2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)
7.2.3.2(f)	7 2.1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)

7.2.4 Initiate Recovery/Transit to Follow on Tasking

7.2.4.1 Pass MISREP

7.2.4 1(a)	7 2 4 1(a)	Pass IFREP

7.2.4.2 Perform Recovery Checks

7.2.4.2(a)	7 2.4.2(a)	Conduct BD Check
7.2 4.2(b)	7.2.4.2(b)	Conduct Fence Out Check

7.2.5 Establish and Maintain Tactical Formation

7.2.5.1 Establish Tactical Formation

7.2.5.1(a)	7.2.5.1(a)	Establish Tactical Roles - Tactical Leads and Wingmen
7.2 5 1(b)	7.2 5.1(b)	Maintain Aircraft Control and Flight Position
7.2.5.1(c)	7.2.5.1(c)	Execute Manoeuvre Turns
7.2.5.1(d)	7.1 1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays

7.2.5.2 Maintain Tactical Formation Integrity

7.2.5.2(a)	7.2.5.2(a)	Optimize Formation for Tactical Situation
7.2.5.2(b)	7.2.5.2(b)	Maintain Visual Mutual Support
7.2.5.2(c)	7.2.5.2(c)	Maintain Positional Mutual Support
7 2.5.2(d)	7.1.1 3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7.2 5.2(e)	7.2.5.2(e)	Maintain Visual Mutual Support with NVG
7.2.5.2(f)	7.2.5.2(f)	Communicate with Formation Members via Discreet Frequency
7.2.5.2(g)	7.2.5.2(g)	Communicate with Formation Members via Data Link

7.2.6 Conduct Enroute Navigation

7.2.6.1 Adhere to Airspace Control Measures

7.2.6 1(a)	7.2.6.1(a)	Maintain Ground Track
7.2 6.1(b)	7.2.6.1(b)	Adhere to ACO
7 2.6.1(c)	7.2.6.1(c)	Adjust G/S to Make Tasking Timings
7.2.6.1(d)	7.2.6.1(d)	Monitor and Avoid ACO Restricted Areas

7.2.6.2 Conduct System/Visual Navigation

7.2 6.2(a)	7.2.6.2(a)	Navigate Using Visual References
7.2.6.2(b)	7 2.6.2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs
7.2.6.2(c)	7.2.6.2(c)	Perform Navigation Systems Designations/Updates
7.2.6.2(d)	7.2.6 2(d)	Employ Watch Map Ground Technique
7.2.6.2(e)	7.2.6.2(e)	Arrive at Target at Predetermined TOT
7.2.6.2(f)	7.2.6.2(f)	Navigate Using NVG Visual References

7.2.6.3 Avoid Hazards

7.2 6.3(a)	7.2 6.3(a)	Monitor and Avoid Weather
7.2.6 3(b)	7.2.6.3(b)	Monitor and Avoid Obstacles
7.2.6.3(c)	7.2.6.3(c)	Monitor and Avoid Terrain
7.2.6.3(e)	7.2.6.3(e)	Monitor and Avoid Other Aircraft

7.2.7 Conduct Sensors Search and Visual Look Out

7.2.7.1 Conduct Radar Search and Surveillance

7 2.7.1(a)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters
7.2.7.1(b)	7.2.7.1(b)	Monitor and Maintain Radar Contact with Formation Members
7 2.7.1(c)	7.2.7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements
7.2.7.1(d)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns
7.2.7.1(e)	7.2.7.1(e)	Advise on Radar Acquired Unknowns
7.2.7.1(f)	7.2.7.1(f)	Radar Sort Multiple Unknown Contacts
7.2 7.1(g)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF
7 2 7.1(h)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays

7.2.7.2 Conduct AMIRS Search and Surveillance

7.2.7.2(a)	7.2.7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters
7.2.7.2(b)	7.2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members
7.2.7.2(c)	7.2.7.2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elemer
7.2.7.2(d)	7.2.7.2(d)	Monitor and Maintain AMIRS Contact with Unknowns
7.2.7.2(e)	7.2.7.2(e)	Advise on AMIRS Acquired Unknowns
7.2.7 2(f)	7.2.7.2(f)	Sort Multiple Unknown Contacts with AMIRS
7.2.7.2(g)	7.2.7.2(g)	Interrogate Unknown AMIRS Contacts with IFF

7.2.7.3 Conduct Visual Search and Surveillance

7.2.7.3(a)	7.2.7.3(a)	Maintain Visual Search Patterns
7.2.7.3(b)	7.2.7.3(b)	Monitor and Maintain Visual Contact with Formation Members
7.2 7.3(c)	7 2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element
7.2.7.3(d)	7.2.7.3(d)	Monitor and Maintain Visual Contact with Unknowns
7.2 7.3(e)	7.2.7.3(e)	Advise on Visually Acquired Unknowns
7.2.7.3(f)	7 2.7.3(f)	Maintain NVG Visual Search Patterns
7.2.7.3(g)	7.2.7.3(g)	Monitor and Maintain NVG Contact with Formation Members
7.2.7.3(h)	7.2.7.3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements
7.2.7.3(ı)	7.2.7.3(i)	Monitor and Maintain NVG Contact with Unknowns

7.3 Conduct OAS Close Air Support

7.3.1 Conduct Ingress

7.3.1.1 Perform FLOT Crossing Procedures

7.3.1.1(a)	7.2.1.1(a)	Reduce Aircraft Emissions (EMCON Procedures)
7.3.1.1(b)	7.2.1.1(b)	Ingress at Low Altitude (Sophisticated Environment)
7.3.1.1(c)	7.2.1.1(c)	Ingress at Medium/High Altitude (Permissive Environement)
7 3.1 1(d)	7 2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)

7.3.1 1(e)	7.2.1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)
7.3.2	**Receive Target Data and Confirm Target Location**	
7.3.2.1	**Receive Target Data**	
7.3.2.1(a)	7.3 2.1(a)	Copy Target Brief from FAC
7.3.2.1(b)	7.3.2.1(b)	Read Back Mandatory Items to FAC
7.3.2.1(c)	7.3.2.1(c)	Enter Target Location in Aircraft database
7 3.2.1(d)	7.3.2.1(e)	Confirm Target Location and Restrictions on MAP/HSD
7 3.2.1(e)	7.3.2.1(e)	Communicate with FAC via DATA LINK 16
7.3.2.2	**Confirm Target Location**	
7.3.2.2(a)	7.3.2.2(a)	Receive Target Description Brief from FAC
7.3.2 2(b)	7.3.2.2(b)	Find Target Using Sensors
7.3.2.2(c)	7 3.2.2(c)	Find Target Visually
7.3.2.2(d)	7.3.2.2(d)	Communicate Target Acquired
7.3.2.2(e)	7.3.2.2(e)	Describe Target Area and Target to FAC
7.3.2.2(f)	7.3.2.2(f)	Conduct Target Run In
7.3.2.2(g)	7.3.2.1(e)	Communicate with FAC via DATA LINK 16
7.3.2.2(h)	7.3.2.2(h)	Find Target with NVG
7.3.3	**Conduct Target Attack**	
7.3.3.1	**Conduct General Purpose (GP) Bomb Attack**	
7.3.3.1(a)	7 2.2.1(a)	Conduct A/G Check
7.3.3.1(b)	7.2.2.1(b)	Identify Initial Point Visually
7.3.3.1(c)	7.2.2.1(c)	Designate/Add Offset at Initial Point
7.3.3.1(d)	7.2.2 1(d)	Manoeuvre to Weapons Delivery Parameters
7.3.3.1(e)	7.2.2.1(b)	Identify Target/DMPI Visually
7.3.3.1(f)	7.2.2.1(f)	Conduct Element Split Attacks
7 3.3.1(g)	7.2.2.1(g)	Validate Weapons Solution Display
7.3.3.1(h)	7.2.2.1(h)	Deliver GP Weapons(Bombs/Rx/Cluster/Gx)
7.3.3.1(i)	7.2 2.1(i)	Conduct Safe Escape Manoeuvre
7.3.3.1(j)	7.2 2.1(j)	Conduct Frag Avoidance Manoeuvre
7.3.3.1(k)	7.2.2.1(k)	Conduct BDA
7.3.3.1(l)	7.2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections
7.3.3.1(m)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays
7.3.3 1(n)	7.2.2.1(n)	Search for Initial Point
7.3.3.1(o)	7 2 2.1(o)	Search for Target
7.3.3 1(p)	7.2.2.1(p)	Identify Initial Point with NVG
7.3.3.1(q)	7.2.2.1(p)	Identify Target/DMPI with NVG
7.3.3.2	**Conduct Precision Guided Munitions (PGM) Attack**	
7.3 3.2(a)	7 2 2.1(a)	Conduct A/G Check

7.3.3.2(b)	7.2.2.2(b)	Designate Target Position
7.3 3.2(c)	7.2.2.2(c)	Identify Target Area with Aircraft Sensors
7 3.3.2(d)	7.2 2 1(d)	Manoeuvre to Weapons Delivery Parameters
7.3.3.2(e)	7.2.2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16
7 3.3.2(f)	7.2.2.1(g)	Validate Weapons Solution Display
7.3.3.2(g)	7.2.2.2(g)	Deliver PGM (LGB/MAV/Adv PGM)
7.3.3.2(h)	7.2.2.2(h)	Conduct Self-Lasing LGB Delivery
7.3.3 2(ı)	7.2.2.2(i)	Conduct Buddy-Lasing LGB Delivery
7.3.3 2(j)	7.2.2.2(j)	Update Target Designation
7.3.3.2(k)	7.2.2.1(ı)	Conduct Safe Escape Manoeuvre
7.3.3 2(l)	7.2.2.1(k)	Conduct BDA
7.3.3.2(m)	7.2 2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections
7 3.3.2(n)	7 2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays
7.3.3.2(o)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre

7.3.4 Conduct Egress

7.3.4.1 Perform Formation Rejoin

7.3.4.1(a)	7.1 1.2(a)	Establish Radar Contact with Other Formation Members
7 3 4.1(b)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7 3.4.1(c)	7 1.1.3(c)	Conduct Formation Join-up
7.3.4.1(d)	7.1 1.2(f)	Establish Visual Contact with Other Formation Members
7.3.4.1(e)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members

7.3.4.2 Perform FLOT Crossing Procedures

7.3.4.2(a)	7.2.1.1(a)	Allow Aircraft Emmisions for Identification
7.3 4.2(b)	7.2.3.2(b)	Egress at Low Altitude
7.3.4.2(c)	7.2.3.2(c)	Egress at Medium/High Altitude
7 3.4.2(d)	7.2.3.2(d)	Conduct Lame Duck Procedures
7.3.4.2(e)	7.2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)
7.3.4.2(f)	7.2.1 1(e)	Adjust to Medium/High Altitude (Permissive Environment)

7.3.5 Initiate Recovery/Transit to Follow on Tasking

7.3.5.1 Pass MISREP

7.3.5.1(a)	7.2 4.1(a)	Pass IFREP

7.3.5.2 Perform Recovery Checks

7.3.5.2(a)	7 2 4.2(a)	Conduct BD Check
7.3.5.2(b)	7.2.4.2(b)	Conduct Fence Out Check

7.3.6 Establish and Maintain Tactical Formation

7.3.6.1 Establish Tactical Formation

7.3.6.1(a)	7 2.5 1(a)	Establish Tactical Roles - Tactical Leads and Wingmen
7.3.6.1(b)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position
7.3 6.1(c)	7 2.5.1(c)	Execute Manoeuvre Turns

	7.3.6 1(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7.3.6.2	**Maintain Tactical Formation and Integrity**		
	7.3.6.2(a)	7.2.5.2(a)	Optimize Formation for Tactical Situation
	7.3.6.2(b)	7.2.5.2(b)	Maintain Visual Mutual Support
	7.3 6.2(c)	7.2.5.2(c)	Maintain Positional Mutual Support
	7.3.6.2(d)	7.1 1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
	7.3.6.2(e)	7.2.5.2(e)	Maintain Visual Mutual Support with NVG
	7.3.6 2(f)	7.2 5.2(f)	Communicate with Formation Members via Discreet frequency
	7.3.6.2(g)	7.2.5.2(g)	Communicate with Formation Members via Data Link
7.3.7	**Conduct Enroute Navigation**		
7.3.7.1	**Adhere to Airspace Control Measures**		
	7.3.7 1(a)	7.2.6.1(a)	Maintain Ground Track
	7 3.7.1(b)	7.2.6.1(b)	Adhere to ACO
	7.3 7.1(c)	7.2 6.1(c)	Adjust G/S to Make Tasking Timings
	7.3.7.1(d)	7.2.6.1(d)	Monitor and Avoid ACO Restricted Areas
7.3.7.2	**Conduct System/Visual Navigation**		
	7.3.7.2(a)	7.2.6.2(a)	Navigate Using Visual References
	7.3.7.2(b)	7.2.6.2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs
	7.3.7.2(c)	7.2.6.2(c)	Perform Navigation Systems Designations/Updates
	7.3.7.2(d)	7.2.6.2(d)	Employ Watch Map Ground Technique
	7.3.7.2(e)	7.2.6.2(e)	Arrive at Target at Predetermined TOT
	7.3.7.2(f)	7.2.6.2(f)	Navigate Using NVG Visual References
7.3.7.3	**Avoid Hazards**		
	7.3.7.3(a)	7.2.6.3(a)	Monitor and Avoid Weather
	7.3.7 3(b)	7.2.6.3(b)	Monitor and Avoid Obstacles
	7.3.7.3(c)	7.2.6.3(c)	Monitor and Avoid Terrain
	7.3.7.3(d)	7.2 6.3(e)	Monitor and Avoid Other Aircraft
7.3.8	**Conduct Sensors Search and Visual Look Out**		
7.3.8.1	**Conduct Radar Search and Surveillance**		
	7.3.8.1(a)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters
	7.3.8.1(b)	7.2 7.1(b)	Monitor and Maintain Radar Contact with Formation Members
	7.3.8.1(c)	7.2 7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements
	7.3.8.1(d)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns
	7.3.8.1(e)	7.2.7.1(e)	Advise on Radar Acquired Unknowns
	7.3 8.1(f)	7.2.7.1(f)	Radar Sort Multiple Unknown Contacts
	7.3.8.1(g)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays
	7.3.8.1(h)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF
7.3.8.2	**Conduct AMIRS Search and Surveillance**		
	7.3.8.2(a)	7.2.7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters

7.3.8.2(b)	7.2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members
7.3 8.2(c)	7.2 7.2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elemer
7.3 8 2(d)	7.2 7.2(g)	Interrogate Unknown AMIRS Contacts with IFF
7.3.8.2(e)	7.2 7.2(d)	Monitor and Maintain AMIRS Contact with Unknowns
7.3.8.2(f)	7.2.7.2(e)	Advise on AMIRS Acquired Unknowns
7.3 8.2(g)	7.2.7.2(f)	Sort Multiple Unknown Contacts with AMIRS

7.3.8.3 Conduct Visual Search and Surveillance

7.3.8.3(a)	7.2.7.3(a)	Maintain Visual Search Patterns
7.3.8.3(b)	7.2.7 3(b)	Monitor and Maintain Visual Contact with Formation Members
7.3.8.3(c)	7.2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element
7.3.8 3(d)	7.2.7.3(d)	Monitor and Maintain Visual Contact with Unknowns
7 3.8.3(e)	7.2.7.3(e)	Advise on Visually Acquired Unknowns
7.3 8 3(f)	7.2 7.3(f)	Maintain NVG Visual Search Patterns
7.3.8.3(g)	7.2.7.3(g)	Monitor and Maintain NVG Contact with Formation Members
7.3.8.3(h)	7.2.7.3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements
7 3.8.3(i)	7.2.7.3(i)	Monitor and Maintain NVG Contact with Unknowns

7.4 Conduct Armed Reconnaissance

7.4.1 Conduct Ingress

7.4.1.1 Perform FLOT Crossing Procedures

7.4.1 1(a)	7.2.1.1(a)	Reduce Aircraft Emissions (EMCON Procedures)
7.4.1.1(b)	7.2.1.1(b)	Ingress at Low Altitude (Sophisticated Environment)
7.4.1.1(c)	7.2.1.1(c)	Ingress at Medium/High Altitude (Permissive Environement)
7.4.1.1(d)	7.2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)
7.4.1.1(e)	7.2.1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)

7.4.2 Locate Enemy Targets

7.4.2.1 Locate Enemy Target

7.4.2.1(a)	7.4.2.1(a)	Conduct Visual Lookout
7.4.2 1(b)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information
7 4.2.1(c)	7.4.2.1(c)	Acquire Enemy Targets on LINK 16/MIDS Displays
7.4.2.1(d)	7.4.2.1(d)	Find Target with Radar Search Sort and Target Contract
7.4.2.1(e)	7.4.2.1(e)	Utilize Lateral Mission Element Tactical Information
7.4.2.1(f)	7.4.2.1(f)	Find Target with AMIRS Search Sort and Target Contract
7.4.2.1(g)	7.4.2.1(g)	Conduct Visual Lookout with NVG

7.4.2.2 Confirm Enemy Target

7.4.2.2(a)	7 4.2.2(a)	Report Target via LINK 16/MIDS Secure Communications
7.4 2 2(b)	7.4.2.2(b)	Report Target via Have Quick II Secure Communications
7.4.2.2(c)	7.4 2.2(c)	Utilize C2 Directive and Descriptive Commentary
7.4.2.2(d)	7 2 2.1(b)	Identify Target/DMPI Visually
7.4.2.2(e)	7.2.2.2(c)	Identify Target Area with Aircraft Sensors

7.4.2.2(f)	7.2.2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16
7.4.2.2(g)	7.2.2.1(p)	Identify Initial Point with NVG

7.4.3 Conduct Target Attack

7.4.3.1 Conduct General Purpose (GP) Bomb Attack

7.4.3 1(a)	7.2.2.1(b)	Identify Initial Point Visually
7.4.3 1(b)	7.2.2.1(c)	Designate/Add Offset at Initial Point
7.4.3.1(c)	7.2.2.1(a)	Conduct A/G Check
7.4.3.1(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters
7.4.3 1(e)	7 2.2 1(b)	Identify Target/DMPI Visually
7.4 3.1(f)	7.2.2.1(f)	Conduct Element Split Attacks
7.4.3.1(g)	7.2.2.1(g)	Validate Weapons Solution Display
7.4.3.1(h)	7.2.2.1(h)	Deliver GP Weapons(Bombs/Rx/Cluster/Gx)
7 4.3.1(i)	7 2.2.1(i)	Conduct Safe Escape Manoeuvre
7.4.3.1(j)	7 2.2.1(j)	Conduct Frag Avoidance Manoeuvre
7.4.3.1(k)	7.2.2.1(k)	Conduct BDA
7.4.3.1(l)	7.2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections
7.4.3.1(m)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays
7.4.3.1(n)	7.2.2.1(n)	Search for Initial Point
7.4 3.1(o)	7.2.2.1(o)	Search for Target
7.4.3.1(p)	7.2.2.1(p)	Identify Initial Point with NVG
7.4.3.1(q)	7.2.2.1(p)	Identify Target/DMPI with NVG

7.4.3.2 Conduct Precision Guided Munitions (PGM) Attack

7.4.3.2(a)	7.2 2.1(a)	Conduct A/G Check
7.4.3.2(b)	7.2.2.2(b)	Designate Target Position
7.4.3.2(c)	7.2.2.2(c)	Identify Target Area with Aircraft Sensors
7 4.3 2(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters
7.4.3 2(e)	7 2.2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16
7.4.3.2(f)	7.2.2.1(g)	Validate Weapons Solution Display
7.4.3.2(g)	7.2.2.2(g)	Deliver PGM (LGB/MAV/Adv PGM)
7.4.3.2(h)	7.2.2.2(h)	Conduct Self-Lasing LGB Delivery
7.4.3.2(i)	7.2.2.2(i)	Conduct Buddy-Lasing LGB Delivery
7.4 3.2(j)	7.2.2.2(j)	Update Target Designation
7.4.3.2(k)	7.2.2.2(i)	Conduct Buddy-Lasing LGB Delivery
7 4.3 2(l)	7 2.2.1(k)	Conduct BDA
7.4.3.2(m)	7.2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections
7.4.3.2(n)	7.2 2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays
7.4 3.2(o)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre
7.4.3.2(p)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre

7.4.4 Conduct Egress

7.4.4.1 Perform Formation Rejoin

7.4.4.1(a)	7.1.1.2(a)	Establish Radar Contact with Other Formation Members
7.4.4.1(b)	7 1.1 3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7.4.4.1(c)	7.1.1.3(c)	Conduct Formation Join-up
7.4.4.1(d)	7.1.1.2(f)	Establish Visual Contact with Other Formation Members
7.4.4 1(e)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members

7.4.4.2 Perform FLOT Crossing Procedures

7.4.4 2(a)	7.2.1.1(a)	Allow Aircraft Emmisions for Identification
7.4.4.2(b)	7.2.3.2(b)	Egress at Low Altitude
7.4.4.2(c)	7.2.3.2(c)	Egress at Medium/High Altitude
7.4.4 2(d)	7.2.3.2(d)	Conduct Lame Duck Procedures
7.4.4.2(e)	7 2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)
7.4.4.2(f)	7.2.1 1(e)	Adjust to Medium/High Altitude (Permissive Environment)

7.4.5 Initiate Recovery/Transit to Follow on Tasking

7.4.5.1 Pass MISREP

7.4.5.1(a)	7.2.4.1(a)	Pass IFREP

7.4.5.2 Perform Recovery Checks

7.4.5 2(a)	7.2.4 2(a)	Conduct BD Check
7.4.5.2(b)	7 2.4.2(b)	Conduct Fence Out Check

7.4.6 Establish and Maintain Formation

7.4.6.1 Establish Tactical Formation

7.4.6.1(a)	7.2.5.1(a)	Establish Tactical Roles - Tactical Leads and Wingmen
7.4 6.1(b)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position
7.4 6.1(c)	7.2.5.1(c)	Execute Manoeuvre Turns
7.4.6.1(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays

7.4.6.2 Maintain Tactical Formation Integrity

7.4.6.2(a)	7.2.5.2(a)	Optimize Formation for Tactical Situation
7.4.6.2(b)	7.2.5.2(b)	Maintain Visual Mutual Support
7 4.6.2(c)	7 2.5.2(c)	Maintain Positional Mutual Support
7.4.6.2(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7.4.6 2(e)	7.2.5 2(e)	Maintain Visual Mutual Support with NVG
7.4.6.2(f)	7.2.5.2(f)	Communicate with Formation Members via Discreet frequency
7.4.6.2(g)	7 2.5.2(g)	Communicate with Formation Members via Data Link

7.4.7 Conduct Enroute Navigation

7.4.7.1 Adhere to Airspace Control Measures

7.4.7.1(a)	7.2.6.1(a)	Maintain Ground Track
7.4.7.1(b)	7.2.6.1(b)	Adhere to ACO
7 4.7.1(c)	7.2.6.1(c)	Adjust G/S to Make Tasking Timings

7 4.7.1(d)	7.2.6.1(d)	Monitor and Avoid ACO Restricted Areas

7.4.7.2 Conduct System/Visual Navigation

7 4.7 2(a)	7.2.6.2(a)	Navigate Using Visual References
7.4.7.2(b)	7 2.6 2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs
7.4 7.2(c)	7.2 6.2(c)	Perform Navigation Systems Designations/Updates
7.4.7.2(d)	7.2.6.2(d)	Employ Watch Map Ground Technique
7.4 7.2(e)	7.2.6.2(e)	Arrive at Target at Predetermined TOT
7.4.7 2(f)	7.2.6.2(f)	Navigate Using NVG Visual References

7.4.7.3 Avoid Hazards

7.4.7.3(a)	7 2.6.3(a)	Monitor and Avoid Weather
7.4.7.3(b)	7.2 6.3(b)	Monitor and Avoid Obstacles
7.4.7.3(c)	7.2.6.3(c)	Monitor and Avoid Terrain
7 4.7.3(d)	7.2.6.3(e)	Monitor and Avoid Other Aircraft

7.4.8 Conduct Sensors Search and Visual Look Out

7.4.8.1 Conduct Radar Search and Surveillance

7.4.8.1(a)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters
7.4.8.1(b)	7.2.7.1(b)	Monitor and Maintain Radar Contact with Formation Members
7.4 8.1(c)	7.2.7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements
7 4.8.1(d)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns
7.4.8.1(e)	7.2.7.1(e)	Advise on Radar Acquired Unknowns
7 4.8.1(f)	7.2.7.1(f)	Radar Sort Multiple Unknown Contacts
7.4.8.1(g)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays
7.4.8.1(h)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF

7.4.8.2 Conduct AMIRS Search and Surveillance

7.4.8.2(a)	7.2.7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters
7.4.8.2(b)	7.2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members
7.4.8.2(c)	7.2.7.2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elemer
7.4.8 2(d)	7.2.7.2(g)	Interrogate Unknown AMIRS Contacts with IFF
7.4.8.2(e)	7.2.7.2(d)	Monitor and Maintain AMIRS Contact with Unknowns
7.4.8.2(f)	7 2.7.2(e)	Advise on AMIRS Acquired Unknowns
7.4.8.2(g)	7.2.7.2(f)	Sort Multiple Unknown Contacts with AMIRS

7.4.8.3 Conduct Visual Search and Surveillance

7.4.8.3(a)	7 2.7.3(a)	Maintain Visual Search Patterns
7.4.8 3(b)	7.2.7.3(b)	Monitor and Maintain Visual Contact with Formation Members
7.4 8.3(c)	7 2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element
7.4.8.3(d)	7 2.7.3(d)	Monitor and Maintain Visual Contact with Unknowns
7.4.8.3(e)	7.2.7 3(e)	Advise on Visually Acquired Unknowns
7.4.8.3(f)	7.2.7.3(f)	Maintain NVG Visual Search Patterns

7.4.8.3(g)	7.2 7.3(g)	Monitor and Maintain NVG Contact with Formation Members
7.4.8.3(h)	7.2.7.3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements
7.4.8 3(i)	7.2.7.3(ı)	Monitor and Maintain NVG Contact with Unknowns

7.5 Conduct TASMO

7.5.1 Conduct Ingress

7.5.1.1 Perform FLOT Crossing Procedures

7.5.1 1(a)	7.2 1.1(a)	Reduce Aircraft Emissions (EMCON Procedures)
7.5.1.1(b)	7.2.1.1(b)	Ingress at Low Altitude (Sophisticated Environment)
7 5.1.1(c)	7.2.1.1(c)	Ingress at Medium/High Altitude (Permissive Environment)
7.5.1.1(d)	7.2 1.1(d)	Descend to Low Altitude (Sophisticated Environment)
7.5 1 1(e)	7.2.1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)

7.5.2 Provide Defensive Cover for Friendly Maritime Forces (Air Threats)

7.5.2.1 Establish CAPs

7.5.2.1(a)	7.2 5.2(a)	Optimize Formation for Tactical Situation
7.5.2 1(b)	7.5.2.1(b)	Conduct CAP

7.5.2.2 Seek Out Enemy Air Threats

7.5.2.2(a)	7.5.2.2(a)	Employ Radar Search Sort and Target Contract
7 5.2.2(b)	7.4.2.1(a)	Conduct Visual Lookout
7.5.2 2(c)	7 4.2.1(b)	Respond to displayed RWR Threat Emission Information
7.5.2.2(d)	7 5.2.2(d)	Initiate and Monitor EID of Unknowns
7 5.2.2(e)	7.5.2.2(e)	Advise on Approaching Threats
7.5.2.2(f)	7.5.2.2(f)	Advise on Visually Acquired Threats
7.5.2.2(g)	7.5.2.2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays
7 5 2.2(h)	7.5.2.2(h)	VID Unknowns
7.5.2.2(ı)	7 4.2.2(a)	Employ LINK 16/MIDS Secure Communications
7 5 2.2(j)	7.4.2.2(c)	Utilize C2 Directive and Descriptive Commentary
7.5.2.2(k)	7.4 2.1(e)	Utilize Lateral Mission Element Tactical Information
7.5.2.2(l)	7.5.2.2(l)	Employ AMIRS Search Sort and Target Contract
7.5.2.2(m)	7 2.7.1(g)	Interrogate Unknown Radar Contacts with IFF
7.5.2 2(n)	7 4 2.2(b)	Employ Have Quick II Secure Communications
7.5.2.2(o)	7.4.2.1(g)	Conduct Visual Lookout with NVG
7.5.2.2(p)	7.5.2.2(p)	VID Unknowns with NVG

7.5.2.3 Degrade Enemy Aircraft Situational Awareness

7.5.2.3(a)	7.5.2.3(a)	Employ Tactical Deception
7.5.2 3(b)	7.5.2 3(b)	Dispense Chaff
7.5.2.3(c)	7.5.2.3(c)	Employ Jammers
7.5.2.3(d)	7.5.2.3(d)	Employ BVR Deception Tactics

7.5.2.4 Decoy Enemy Air Threat

7.5.2.4(a)	7 5 2.4(a)	Manoeuvre/Expose the Tactical Formation

7.5.2.4(b)	7.5.2.4(b)	Illuminate Enemy Air RWR
7.5.2.4(c)	7.5.2.4(c)	Enhance Enemy Air Radar Acquisition
7.5.2 4(d)	7.5.2.4(d)	Draw Enemy Air Away
7.5.2.4(e)	7.5.2 4(e)	Negate Enemy Air Weapons Employment

7.5.2.5 Negate Enemy Air Threat

7.5.2.5(a)	7.5.2 5(a)	Deny Enemy Air Weapons Solution
7.5.2.5(b)	7.5 2.5(b)	Negate Enemy Air Weapons Employment
7.5.2 5(c)	7.5.2.5(c)	Employ Air-to-Air RMD
7.5.2.5(d)	7.5 2.5(d)	Employ Air-to-Air IRMD
7.5.2 5(e)	7.5.2.5(e)	Employ AAGD
7.5.2.5(f)	7.5.2.5(f)	Egress Engagement Safely
7.5.2.5(g)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information
7.5 2.5(h)	7.5.2.2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays

7.5.2.6 Conduct Air Intercept

7.5.2.6(a)	7 5.2.6(a)	Manoeuvre Aircraft to Intercept Enemy
7.5.2.6(b)	7.5.2.5(b)	Negate Enemy Air Weapons Employment
7.5.2.6(c)	7.5.2.5(a)	Deny Enemy Air Weapons Solution

7.5.2.7 Destroy Enemy Air Threat

7.5.2.7(a)	7.5.2.7(a)	Manoeuvre to a Weapons Engagement Zone
7.5.2.7(b)	7.2.2.1(g)	Validate Weapons Solution Display
7.5.2.7(c)	7.5.2.7(c)	Employ Weapons
7.5 2.7(d)	7.5.2.7(d)	Maintain Post Attack Offensive
7.5.2.7(e)	7.5.2.5(f)	Egress Engagement Safely
7 5.2.7(f)	7.5.2.7(f)	Assess Post Merge ACM Options
7.5.2.7(g)	7.5.2.7(g)	Monitor Weapon Fly Out

7.5.3 Provide Defensive Cover for Friendly Maritime Forces (SurfaceThreats)

7.5.3.1 Seek Out Enemy Naval Surface Threats

7.5.3.1(a)	7 4.2.1(a)	Conduct Visual Lookout
7.5.3.1(b)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information
7.5 3.1(c)	7 4.2.1(c)	Acquire Enemy Targets on LINK 16/MIDS Displays
7.5.3.1(d)	7.4.2.1(d)	Find Target with Radar Search Sort and Target Contract
7.5.3.1(e)	7.4.2.1(e)	Utilize Lateral Mission Element Tactical Information
7 5.3.1(f)	7.4.2.1(f)	Find Target with AMIRS Search Sort and Target Contract

7.5.3.2 Confirm Enemy Naval Target

7.5.3.2(a)	7 4.2 2(a)	Report Target via LINK 16/MIDS Secure Communications
7.5.3.2(b)	7.4.2.2(b)	Report Target via Have Quick II Secure Communications
7.5.3.2(c)	7.4.2.2(c)	Utilize C2 Directive and Descriptive Commentary
7.5.3.2(d)	7.2.2 1(b)	Identify Target/DMPI Visually

7.5.3.2(e)	7.2.2.2(c)	Identify Target Area with Aircraft Sensors
7.5.3.2(f)	7.2.2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16
7.5.3 2(g)	7.2.2.1(p)	Identify Target/DMPI with NVG

7.5.4 Conduct Target Attack

7.5.4.1 Conduct General Purpose (GP) Bomb Attack

7 5.4.1(a)	7.2.2.1(a)	Conduct A/G Check
7.5.4.1(b)	7.2 2.1(b)	Identify Initial Point Visually
7.5.4.1(c)	7.2.2.1(c)	Designate/Add Offset at Initial Point
7.5.4.1(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters
7.5.4.1(e)	7.2.2.1(b)	Identify Target/DMPI Visually
7.5 4.1(f)	7.2.2.1(f)	Conduct Element Split Attacks
7.5 4.1(g)	7.2.2.1(g)	Validate Weapons Solution Display
7.5.4.1(h)	7.2.2 1(h)	Deliver GP Weapons(Bombs/Rx/Cluster/Gx)
7 5.4.1(i)	7.2 2.1(i)	Conduct Safe Escape Manoeuvre
7.5.4.1(j)	7 2.2.1(j)	Conduct Frag Avoidance Manoeuvre
7.5.4.1(k)	7.2 2.1(k)	Conduct BDA
7.5.4.1(l)	7.2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections
7.5.4.1(m)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays
7.5 4.1(n)	7.2.2 1(n)	Search for Initial Point
7.5.4.1(o)	7.2.2.1(o)	Search for Target
7.5 4.1(p)	7.2.2.1(p)	Identify Initial Point with NVG
7 5.4 1(q)	7.2.2.1(p)	Identify Target/DMPI with NVG

7.5.4.2 Conduct Precision Guided Munitions (PGM) Attack

7.5 4.2(a)	7.2.2.1(a)	Conduct A/G Check
7.5.4.2(b)	7.2.2.2(b)	Designate Target Position
7.5.4.2(c)	7.2 2.2(c)	Identify Target Area with Aircraft Sensors
7.5.4.2(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters
7 5.4.2(e)	7.2 2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16
7.5.4.2(f)	7.2.2.1(g)	Validate Weapons Solution Display
7 5.4.2(g)	7.2.2.2(g)	Deliver PGM (LGB/MAV/Adv PGM)
7.5.4 2(h)	7 2.2.2(h)	Conduct Self-Lasing LGB Delivery
7.5.4.2(i)	7.2.2.2(i)	Conduct Buddy-Lasing LGB Delivery
7.5.4 2(j)	7.2.2 2(j)	Update Target Designation
7.5.4.2(k)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre
7.5.4.2(l)	7.2.2.1(k)	Conduct BDA
7.5 4.2(m)	7.2.2 1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections
7.5 4.2(n)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays
7.5.4.2(o)	7.2 2.1(j)	Conduct Frag Avoidance Manoeuvre

7.5.5 Conduct Egress

7.5.5.1 Perform Formation Rejoin

7.5.5 1(a)	7.1.1 2(a)	Establish Radar Contact with Other Formation Members
7.5 5.1(b)	7 1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7.5.5 1(c)	7.1.1.3(c)	Conduct Formation Join-up
7.5.5.1(d)	7 1.1.2(f)	Establish Visual Contact with Other Formation Members
7.5 5.1(e)	7 1.1.2(h)	Establish NVG Contact with Other Formation Members

7.5.5.2 Perform FLOT Crossing Procedures

7.5.5.2(a)	7 2.1.1(a)	Allow Aircraft Emmisions for Identification
7.5.5.2(b)	7.2.3.2(b)	Egress at Low Altitude
7.5.5.2(c)	7.2.3.2(c)	Egress at Medium/High Altitude
7.5.5.2(d)	7.2 3.2(d)	Conduct Lame Duck Procedures
7 5.5.2(e)	7.2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)
7.5 5.2(f)	7 2.1 1(e)	Adjust to Medium/High Altitude (Permissive Environment)

7.5.6 Initiate Recovery/Transit to Follow on Tasking

7.5.6.1 Pass MISREP

7.5 6.1(a)	7.2.4.1(a)	Pass IFREP

7.5.6.2 Perform Recovery Checks

7.5.6.2(a)	7 2.4.2(a)	Conduct BD Check
7.5.6.2(b)	7.2 4.2(b)	Conduct Fence Out Check

7.5.7 Establish and Maintain Formation

7.5.7.1 Establish Tactical Formation

7.5.7.1(a)	7.1.1 3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7 5.7 1(b)	7.2.5.1(a)	Establish Tactical Roles - Tactical Leads and Wingmen
7.5.7.1(c)	7.2.5 1(c)	Execute Manoeuvre Turns
7.5.7.1(d)	7 2.5.1(b)	Maintain Aircraft Control and Flight Position
7.5.7 1(e)	7.2 5.2(f)	Communicate with Formation Members via Discreet frequency
7.5.7.1(f)	7.2.5.2(g)	Communicate with Formation Members via Data Link

7.5.7.2 Maintain Tactical Formation Integrity

7.5.7.2(a)	7.2.5.2(a)	Optimize Formation for Tactical Situation
7.5.7.2(b)	7 2.5.2(b)	Maintain Visual Mutual Support
7.5.7.2(c)	7 2.5 2(c)	Maintain Positional Mutual Support
7.5.7.2(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7.5 7.2(e)	7.2.5.2(e)	Maintain Visual Mutual Support with NVG

7.5.8 Conduct Enroute Navigation

7.5.8.1 Adhere to Airspace Control Measures

7.5.8 1(a)	7.2.6.1(a)	Maintain Ground Track
7.5.8.1(b)	7.2.6.1(b)	Adhere to ACO
7.5.8 1(c)	7.2 6.1(c)	Adjust G/S to Make Tasking Timings

	7.5.8.1(d)	7.2.6.1(d)	Monitor and Avoid ACO Restricted Areas
7.5.8.2	**Conduct System/Visual Navigation**		
	7.5 8.2(a)	7.2 6.2(a)	Navigate Using Visual References
	7.5.8.2(b)	7 2.6.2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs
	7 5.8.2(c)	7 2.6.2(c)	Perform Navigation Systems Designations/Updates
	7.5.8.2(d)	7 2.6.2(d)	Employ Watch Map Ground Technique
	7.5.8.2(e)	7.2.6.2(e)	Arrive at Target at Predetermined TOT
	7.5.8.2(f)	7 2.6.2(f)	Navigate Using NVG Visual References
7.5.8.3	**Avoid Hazards**		
	7.5.8.3(a)	7.2.6.3(a)	Monitor and Avoid Weather
	7.5 8.3(b)	7.2.6.3(b)	Monitor and Avoid Obstacles
	7.5.8.3(c)	7.2.6 3(c)	Monitor and Avoid Terrain
	7.5.8.3(d)	7 2.6.3(e)	Monitor and Avoid Other Aircraft
7.5.9	**Conduct Sensors Search and Visual Look Out**		
7.5.9.1	**Conduct Radar Search and Surveillance**		
	7.5.9.1(a)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns
	7.5.9 1(b)	7.2.7 1(e)	Advise on Radar Acquired Unknowns
	7 5.9.1(c)	7 2.7.1(f)	Radar Sort Multiple Unknown Contacts
	7.5.9.1(d)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters
	7.5.9.1(e)	7.2.7.1(b)	Monitor and Maintain Radar Contact with Formation Members
	7.5.9.1(f)	7.2.7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements
	7.5.9.1(g)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays
	7.5.9.1(h)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF
7.5.9.2	**Conduct AMIRS Search and Surveillance**		
	7.5.9.2(a)	7.2.7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters
	7.5.9.2(b)	7.2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members
	7.5.9.2(c)	7.2.7.2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elemer
	7.5.9.2(d)	7.2 7.2(g)	Interrogate Unknown AMIRS Contacts with IFF
	7.5.9.2(e)	7.2 7.2(d)	Monitor and Maintain AMIRS Contact with Unknowns
	7 5.9 2(f)	7.2 7.2(e)	Advise on AMIRS Acquired Unknowns
	7.5.9.2(g)	7.2.7.2(f)	Sort Multiple Unknown Contacts with AMIRS
7.5.9.3	**Conduct Visual Search and Surveillance**		
	7.5.9.3(a)	7.2.7.3(a)	Maintain Visual Search Patterns
	7.5.9.3(b)	7.2 7.3(b)	Monitor and Maintain Visual Contact with Formation Members
	7.5.9.3(c)	7 2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element
	7.5 9.3(d)	7.2.7.3(d)	Monitor and Maintain Visual Contact with Unknowns
	7.5.9.3(e)	7.2.7.3(e)	Advise on Visually Acquired Unknowns
	7.5.9.3(f)	7.2.7.3(f)	Maintain NVG Visual Search Patterns

7.5.9.3(g)	7.2.7.3(g)	Monitor and Maintain NVG Contact with Formation Members
7 5.9.3(h)	7.2 7.3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements
7 5.9.3(i)	7 2.7.3(i)	Monitor and Maintain NVG Contact with Unknowns

7.6 Conduct Air-to-Air Refueling

7.6.1 Transit to AAR Area

7.6.1.1 Establish Tactical Formation

7.6.1 1(a)	7.2.5 1(a)	Establish Tactical Roles - Tactical Leads and Wingmen
7.6 1.1(b)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position
7.6.1.1(c)	7 2.5.1(c)	Execute Manoeuvre Turns

7.6.1.2 Maintain Tactical Formation Integrity

7.6.1.2(a)	7.2.5.2(a)	Optimize Formation for Tactical Situation
7.6 1.2(b)	7.2.5.2(b)	Maintain Visual Mutual Support
7.6.1.2(c)	7.2.5.2(c)	Maintain Positional Mutual Support
7.6.1 2(d)	7 2.5.2(e)	Maintain Visual Mutual Support with NVG

7.6.1.3 Adhere to Air Space Control Measures

7 6.1 3(a)	7.2.6.1(a)	Maintain Ground Track
7.6.1 3(b)	7.2.6.1(b)	Adhere to ACO
7.6.1.3(c)	7.2.6.1(c)	Adjust G/S to Make Tasking Timings
7 6.1.3(d)	7 2.6.1(d)	Monitor and Avoid ACO Restricted Areas

7.6.1.4 Conduct System/Visual Navigation

7.6.1.4(a)	7 2.6.2(a)	Navigate Using Visual References
7.6.1 4(b)	7.2.6 2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs
7.6.1.4(c)	7.2.6.2(c)	Perform Navigation Systems Designations/Updates
7.6.1.4(d)	7.2.6.2(d)	Employ Watch Map Ground Technique
7 6.1.4(e)	7 2.6.2(e)	Arrive at Target at Predetermined TOT
7.6.1.4(f)	7.2.6 2(f)	Navigate Using NVG Visual References

7.6.1.5 Avoid Hazards

7.6.1.5(a)	7.2.6.3(a)	Monitor and Avoid Weather
7.6.1 5(b)	7.2.6.3(b)	Monitor and Avoid Obstacles
7.6.1.5(c)	7.2.6.3(c)	Monitor and Avoid Terrain

7.6.1.6 Conduct Radar Search and Surveillance

7 6.1 6(a)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters
7.6.1.6(b)	7.2.7.1(b)	Monitor and Maintain Radar Contact with Formation Members
7.6 1.6(c)	7.2.7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements
7.6 1.6(d)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns
7.6 1.6(e)	7.2 7.1(e)	Advise on Radar Acquired Unknowns
7.6.1.6(f)	7.2.7.1(f)	Radar Sort Multiple Unknown Contacts
7.6.1.6(g)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays
7.6 1.6(h)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF

7.6.1.7	**Conduct AMIRS Search and Surveillance**		
	7.6.1.7(a)	7.2 7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters
	7.6 1.7(b)	7.2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members
7.6.1.8	**Conduct Visual Search and Surveillance**		
	7.6.1.8(a)	7.2.7.3(a)	Maintain Visual Search Patterns
	7.6.1.8(b)	7.2.7.3(b)	Monitor and Maintain Visual Contact with Formation Members
	7.6.1 8(c)	7 2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element
	7.6.1.8(d)	7 2.7.3(d)	Monitor and Maintain Visual Contact with Unknowns
	7.6.1.8(e)	7.2.7.3(e)	Advise on Visually Acquired Unknowns
	7.6.1.8(f)	7.2.7.3(f)	Maintain NVG Visual Search Patterns
	7.6.1.8(g)	7 2.7.3(g)	Monitor and Maintain NVG Contact with Formation Members
	7.6.1.8(h)	7 2 7.3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements
	7.6.1 8(i)	7.2.7.3(ı)	Monitor and Maintain NVG Contact with Unknowns
7.6.2	**Conduct Approach to Contact**		
7.6.2.1	**Establish Closure**		
	7.6.2.1(a)	7.6.2.1(a)	Generate Positive Closure
	7.6.2 1(b)	7.6.2.1(b)	Maintain Positive Closure
	7.6.2.1(c)	7.6.2.1(c)	Monitor and Obey AAR Lights
7.6.2.2	**Establish Attitude Referencees**		
	7.6.2 2(a)	7 6.2.2(a)	Position Pitch Ladders
	7.6.2.2(b)	7.6.2.2(b)	Align Probe
	7.6.2.2(c)	7.6.2 1(c)	Monitor and Obey AAR Lights
7.6.2.3	**Move in to Contact**		
	7.6.2.3(a)	7 6.2.3(a)	Pick Approach Reference
	7 6.2.3(b)	7.6.2.3(b)	Maintain Attitude References
	7.6.2.3(c)	7.6.2 3(c)	Make Contact
	7.6.2 3(d)	7.6 2.1(c)	Monitor and Obey AAR Lights
7.6.3	**Conduct Refueling**		
7.6.3.1	**Establish Maximum Offload Rate**		
	7.6.3.1(a)	7.6.3.1(a)	Generate Maximum Fuel Transfer
	7.6.3.1(b)	7.6.2.1(c)	Monitor and Obey AAR Lights
7.6.3.2	**Maintain Contact**		
	7.6.3 2(a)	7.6 3.1(a)	Maintain Hose in Trail Position
	7.6.3.2(b)	7.6.2.3(c)	Maintain Probe Contact
	7.6 3.2(c)	7 6.2.1(c)	Monitor and Obey AAR Lights
7.6.3.3	**Conduct Disconnect**		
	7 6.3.3(a)	7.6.3.3(a)	Generate Negative Closure
	7 6.3.3(b)	7.6.2.3(b)	Maintain Attitude References
	7.6.3 3(c)	7.6.3.3(c)	Move to Astern Position

7.6.3.3(d)	7.6.2.1(c)	Monitor and Obey AAR Lights
7.6.3.3(e)	7.6.3.3(e)	Move to Outboard / Echelon Position

7.6.4 Initiate Recovery/Transit to Follow on Tasking

7.6.4.1 Depart Tanker

7.6 4.1(a)	7.6.4 1(a)	Establish Departure Echelon Position
7 6.4.1(b)	7.6.4.1(b)	Request Clearance to Depart
7.6 4.1(c)	7.6.4.1(c)	Depart

7.6.4.2 Establish Tactical Formation

7.6.4 2(a)	7.2.5.1(a)	Establish Tactical Roles - Tactical Leads and Wingmen
7.6 4.2(b)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position
7.6.4.2(c)	7.2.5.1(c)	Execute Manoeuvre Turns
7.6 4.2(d)	7 1.1 3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays

7.6.4.3 Maintain Tactical Formation Integrity

7.6 4.3(a)	7.2.5.2(a)	Optimize Formation for Tactical Situation
7.6.4.3(b)	7.2.5.2(b)	Maintain Visual Mutual Support
7.6.4.3(c)	7 2.5.2(c)	Maintain Positional Mutual Support
7.6.4.3(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays
7 6.4 3(e)	7.2.5.2(e)	Maintain Visual Mutual Support with NVG

7.6.4.4 Adhere to Air Space Control Measures

7.6.4 4(a)	7.2.6.1(a)	Maintain Ground Track
7.6 4.4(b)	7 2.6.1(b)	Adhere to ACO
7.6.4.4(c)	7.2.6.1(c)	Adjust G/S to Make Tasking Timings
7.6.4.4(d)	7.2.6 1(d)	Monitor and Avoid ACO Restricted Areas

7.6.4.5 Conduct System/Visual Navigation

7.6.4.5(a)	7.2.6.2(a)	Navigate Using Visual References
7.6.4.5(b)	7.2.6.2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs
7.6.4.5(c)	7.2.6.2(c)	Perform Navigation Systems Designations/Updates
7.6.4.5(d)	7.2.6.2(d)	Employ Watch Map Ground Technique
7.6.4.5(e)	7.2.6 2(e)	Arrive at Target at Predetermined TOT
7 6.4 5(f)	7.2.6.2(f)	Navigate Using NVG Visual References

7.6.4.6 Avoid Hazards

7.6.4.6(a)	7.2 6.3(a)	Monitor and Avoid Weather
7 6.4.6(b)	7.2.6.3(b)	Monitor and Avoid Obstacles
7 6 4.6(c)	7.2 6.3(c)	Monitor and Avoid Terrain
7.6.4.6(d)	7.2.6.3(e)	Monitor and Avoid Other Aircraft

7.6.4.7 Conduct Radar Search and Surveillance

7.6.4.7(a)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters
7.6.4.7(b)	7.2.7.1(b)	Monitor and Maintain Radar Contact with Formation Members
7.6 4.7(c)	7.2.7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements

7.6.4.7(d)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns
7.6.4.7(e)	7.2.7.1(e)	Advise on Radar Acquired Unknowns
7.6.4 7(f)	7.2.7.1(f)	Radar Sort Multiple Unknown Contacts
7.6 4.7(g)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays
7.6.4.7(h)	7.2 7.1(g)	Interrogate Unknown Radar Contacts with IFF

7.6.4.8 Conduct AMIRS Search and Surveillance

7.6.4.8(a)	7.2.7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters
7.6.4 8(b)	7.2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members
7.6.4.8(c)	7.2.7.2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elemer
7.6.4.8(d)	7.2.7.2(g)	Interrogate Unknown AMIRS Contacts with IFF
7.6.4 8(e)	7.2.7.2(d)	Monitor and Maintain AMIRS Contact with Unknowns
7.6 4.8(f)	7.2.7.2(e)	Advise on AMIRS Acquired Unknowns
7.6 4.8(g)	7.2.7.2(f)	Sort Multiple Unknown Contacts with AMIRS

7.6.4.9 Conduct Visual Search and Surveillance

7 6.4.9(a)	7.2.7.3(a)	Maintain Visual Search Patterns
7.6.4.9(b)	7.2 7.3(b)	Monitor and Maintain Visual Contact with Formation Members
7.6.4.9(c)	7.2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element
7 6.4.9(d)	7.2.7.3(d)	Monitor and Maintain Visual Contact with Unknowns
7.6 4.9(e)	7.2 7.3(e)	Advise on Visually Acquired Unknowns
7.6.4.9(f)	7.2.7.3(f)	Maintain NVG Visual Search Patterns
7 6.4.9(g)	7.2.7.3(g)	Monitor and Maintain NVG Contact with Formation Members
7.6.4.9(h)	7.2.7.3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements
7.6.4.9(i)	7.2.7.3(i)	Monitor and Maintain NVG Contact with Unknowns

7.7 React to Threats

7.7.1 Detect Enemy Air Threats

7.7.1.1 Seek Out Enemy Air Threats

7.7.1.1(a)	7 5.2.2(a)	Employ Radar Search Sort and Target Contract
7.7.1.1(b)	7.4 2.1(a)	Conduct Visual Lookout
7 7.1.1(c)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information
7.7.1.1(d)	7.5.2.2(d)	EID Unknowns
7.7.1 1(e)	7.5.2.2(e)	Advise on Approaching Threats
7.7.1.1(f)	7.5.2.2(f)	Advise on Visually Acquired Threats
7.7.1.1(g)	7.5.2.2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays
7.7.1 1(h)	7.5.2.2(h)	VID Unknowns
7.7.1.1(i)	7 4.2.2(a)	Employ LINK 16/MIDS Secure Communications
7.7.1 1(j)	7.4.2.2(c)	Utilize C2 Directive and Descriptive Commentary
7.7.1 1(k)	7.4.2.1(e)	Utilize Lateral Mission Element Tactical Information
7.7.1.1(l)	7 5.2.2(l)	Employ AMIRS Search Sort and Target Contract

7.7.1 1(m)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF
7.7.1.1(n)	7.4.2 2(b)	Employ Have Quick II Secure Communications
7.7.1.1(o)	7.4.2.1(g)	Conduct Visual Lookout with NVG
7.7.1.1(p)	7 5.2.2(p)	VID Unknowns with NVG

7.7.2 Avoid Enemy Air Threats

7.7.2.1 Avoid Detection by Enemy Air Threat

7.7.2.1(a)	7.7.2 1(a)	Manoeuvre the Tactical Formation
7.7.2.1(b)	7.7.2.1(b)	Avoid Illuminating of the Enemy Air RWR
7.7.2.1(c)	7.7.2 1(c)	Configure the Tactical Formation
7 7.2.1(d)	7.7.2.1(d)	Establish Diverging Paths
7.7.2.1(e)	7.7.2.1(e)	React Aggressively to Enemy Air Manoeuvre
7.7.2.1(f)	7.7.2.1(f)	Limit Exposure Using Terrain Masking
7.7.2.1(g)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information
7.7.2.1(h)	7 5.2 2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays

7.7.2.2 Degrade Enemy Aircraft Situational Awareness

7.7.2.2(a)	7.5.2.3(a)	Employ Tactical Deception
7.7.2 2(b)	7.5.2.3(b)	Dispense Chaff
7.7 2.2(c)	7.5.2 3(c)	Employ Jammers
7.7.2.2(d)	7.5.2.3(d)	Employ BVR Deception Tactics

7.7.2.3 Decoy Enemy Air Threat

7.7 2.3(a)	7.5 2.4(a)	Manoeuvre/Expose the Tactical Formation
7 7 2.3(b)	7.5 2.4(b)	Illuminate Enemy Air RWR
7.7.2.3(c)	7.5.2.4(c)	Enhance Enemy Air Radar Acquisition
7.7.2.3(d)	7.5.2.4(d)	Draw Enemy Air Away
7.7 2 3(e)	7.5 2.4(e)	Negate Enemy Air Weapons Employment

7.7.2.4 Negate Enemy Air Threat

7.7.2 4(a)	7.5.2 5(a)	Deny Enemy Air Weapons Solution
7.7.2.4(b)	7.5.2.5(b)	Negate Enemy Air Weapons Employment
7.7.2.4(c)	7.5.2.5(c)	Employ Air-to-Air RMD
7.7.2.4(d)	7.5.2.5(d)	Employ Air-to-Air IRMD
7.7.2.4(e)	7.5.2.5(e)	Employ AAGD
7.7.2.4(f)	7.5.2.5(f)	Egress Engagement Safely
7 7.2.4(g)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information
7 7.2.4(h)	7.5.2.2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays

7.7.3 Engage Enemy Air Threats

7.7.3.1 Degrade Enemy Aircraft Situational Awareness

7.7.3.1(a)	7.5.2.3(a)	Employ Tactical Deception
7.7.3.1(b)	7.5.2.3(b)	Dispense Chaff
7.7.3.1(c)	7.5.2.3(c)	Employ Jammers

	7.7.3.1(d)	7.5.2 3(d)	Employ BVR Deception Tactics
7.7.3.2	**Conduct Air Intercept**		
	7.7.3.2(a)	7 5 2.6(a)	Manoeuvre Aircraft to Intercept Enemy
	7.7.3.2(b)	7.5.2.5(b)	Negate Enemy Air Weapons Employment
	7.7.3.2(c)	7.5 2.5(a)	Deny Enemy Air Weapons Solution
7.7.3.3	**Decoy Enemy Air Threat**		
	7.7.3.3(a)	7.5.2.4(a)	Manoeuvre/Expose the Tactical Formation
	7.7.3.3(b)	7.5.2.4(b)	Illuminate Enemy Air RWR
	7.7.3.3(c)	7.5.2.4(c)	Enhance Enemy Air Radar Acquisition
	7.7.3.3(d)	7.5.2.4(d)	Draw Enemy Air Away
	7.7.3.3(e)	7.5.2.4(e)	Negate Enemy Air Weapons Employment
7.7.3.5	**Destroy Enemy Air Threat**		
	7.7.3.5(a)	7.5.2.7(a)	Manoeuvre to a Weapons Engagement Zone
	7.7.3.5(b)	7.2.2.1(g)	Validate Weapons Solution Display
	7.7.3.5(c)	7.5.2.7(c)	Employ Weapons
	7.7.3.5(d)	7.5.2.7(d)	Maintain Post Attack Offensive
	7 7.3.5(e)	7.5.2.5(f)	Egress Engagement Safely
	7 7.3.5(f)	7.5.2.7(f)	Assess Post Merge ACM Options
	7.7 3.5(g)	7.5.2.7(g)	Monitor Weapon Fly Out
7.7.3.6	**Negate Enemy Air Threat**		
	7.7 3.6(a)	7.5.2.5(a)	Deny Enemy Air Weapons Solution
	7.7.3.6(b)	7.5.2 5(b)	Negate Enemy Air Weapons Employment
	7.7.3.6(c)	7.5.2.5(c)	Employ Air-to-Air RMD
	7.7.3.6(d)	7.5.2.5(d)	Employ Air-to-Air IRMD
	7.7 3.6(e)	7 5.2 5(e)	Employ AAGD
	7.7.3.6(f)	7.5.2.5(f)	Egress Engagement Safely
	7.7 3.6(g)	7 4.2.1(b)	Respond to displayed RWR Threat Emission Information
	7.7.3.6(h)	7.5.2.2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays
	7.7.3.6(i)	7.7.3.6(i)	Jettison External Stores
7.7.4	**Detect Enemy Surface Threats**		
7.7.4.1	**Seek Out Enemy Surface Threats**		
	7.7.4.1(a)	7.4.2.1(a)	Conduct Visual Lookout
	7.7.4.1(b)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information
	7 7 4.1(c)	7 5.2 2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays
	7.7.4.1(d)	7.4.2.1(g)	Conduct Visual Lookout with NVG
	7.7.4.1(e)	7.5.2.2(f)	Advise on Visually Acquired SAM/AAA
7.7.5	**Avoid Enemy Surface Threats**		
7.7.5.1	**Minimise Exposure**		
	7.7.5 1(a)	7.7.5.1(a)	Employ High Speed Flight

	7.7.5.1(b)	7 7 5.1(b)	Employ Low Speed Flight
	7.7.5.1(c)	7.7.5.1(c)	Avoid Threat Envelopes
	7.7.5.1(d)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays
7.7.5.2	**Employ DEWS**		
	7.7.5.2(a)	7 4 2.1(b)	Analyse displayed RWR Threat Emission Information
	7.7.5.2(b)	7.5.2.3(c)	Employ Jammers
	7.7 5.2(c)	7.5.2.3(b)	Dispense Chaff
7.7.5.3	**Employ Environment**		
	7.7.5.3(a)	7.7.2.1(f)	Limit Exposure Using Terrain Masking
	7.7 5 3(b)	7 7 5.3(b)	Employ Atmospheric Phenomena
7.7.6	**Defeat Enemy Surface Threats**		
7.7.6.1	**Employ DEWS**		
	7.7.6.1(a)	7 5 2.3(c)	Employ Jammers
	7.7.6.1(b)	7.7.6.1(b)	Employ Defensive Counter Measures
7.7.6.2	**Employ Environment**		
	7.7.6.2(a)	7.7.2.1(f)	Limit Exposure Using Terrain Masking
	7.7.6.2(b)	7 7.5.3(b)	Employ Atmospheric Phenomena
7.7.6.3	**Employ Surface Threat Counter Measures**		
	7.7.6.3(a)	7.7.6.3(a)	Employ Surface-to-Air RMD
	7.7.6.3(b)	7 7 6.3(b)	Employ Surface-to-Air IRMD
	7.7.6.3(c)	7.5.2.5(e)	Employ AAAD
	7.7.6.3(d)	7.7.3.6(i)	Jettison External Stores
7.7.6.4	**Conduct Attack on Surface Threat**		
	7.7.6 4(a)	7.2.2.1(a)	Conduct A/G Check
	7.7.6.4(b)	7.2.2.1(b)	Identify Initial Point Visually
	7.7.6.4(c)	7.2.2.1(c)	Designate/Add Offset at Initial Point
	7.7 6 4(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters
	7.7.6.4(e)	7.2.2.1(b)	Identify Target/DMPI Visually
	7.7.6 4(f)	7.2.2.1(f)	Conduct Element Split Attacks
	7.7.6.4(g)	7 2.2.1(g)	Validate Weapons Solution Display
	7.7.6.4(h)	7.2.2.1(h)	Deliver GP Weapons(Bombs/Rx/Cluster/Gx)
	7.7.6.4(I)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre
	7.7.6.4(j)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre
	7.7.6.4(k)	7.2.2.1(k)	Conduct BDA
	7.7.6.4(l)	7 2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections
	7.7.6.4(m)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays
	7.7 6.4(n)	7 2 2.2(b)	Designate Target Position
	7.7.6 4(o)	7.2.2.2(c)	Identify Target Area with Aircraft Sensors
	7 7.6.4(p)	7.2.2 2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16

7.7.6.4(q)	7.2.2.2(g)	Deliver PGM (LGB/MAV/Adv PGM)
7 7.6.4(r)	7.2.2.2(h)	Conduct Self-Lasing LGB Delivery
7.7.6 4(s)	7 2.2.2(i)	Conduct Buddy-Lasing LGB Delivery
7.7.6.4(t)	7.2 2.2(j)	Update Target Designation
7.7 6 4(u)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre
7.7.6.4(v)	7.2.2.1(n)	Search for Initial Point
7.7.6.4(w)	7.2.2.1(o)	Search for Target
7.7.6.4(x)	7 2.2.1(p)	Identify Initial Point with NVG
7.7.6.4(y)	7.2.2.1(p)	Identify Target/DMPI with NVG
7 7.6.4(z)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre

7.8 Monitor Communications

7.8.1 Monitor Tactical Frequencies

7.8.1.1 Tasks Associated with Monitor Tactical Frequencies

7 8.1.1(a)	7 8 1.1(a)	Monitor Common Secure Voice Frequencies
7 8.1.1(b)	7.8.1.1(a)	Monitor Discreet Voice Frequencies
7.8.1.1(c)	7.8.1.1(c)	Monitor Broadcast Frequencies

7.8.2 Monitor ATC Frequencies

7.8.2.1 Tasks Associated with Monitor ATC Frequencies

7.8.2.1(a)	7.8.1.1(a)	Monitor Secure Voice Frequencies
7.8.2.1(b)	7.8.1.1(a)	Monitor Broadcast Frequencies
7 8.2.1(c)	7.8.1.1(c)	Monitor Broadcast Frequencies

7.8.3 Monitor LINK 16/MIDS

7.8.3.1 Tasks Associated with Monitor Data Link

7.8.3.1(b)	7.8.3.1(b)	Monitor Secure LINK 16 Frequencies

7.8.4 Monitor Guard Frequencies

7.8.4.1 Tasks Associated with Monitor Guard Frequencies

7.8 4.1(a)	7.8.1.1(a)	Monitor UHF Guard Frequency and Monitoring Mode
7 8.4.1(b)	7 8.1.1(a)	Monitor AM/FM Guard Frequency and Monitoring Mode

7.9 Monitor Aircraft Systems

7.9.1 Monitor and Manage Fuel System

7.9.1.1 Tasks Associated with Monitor and Manage Fuel System

7.9.1.1(a)	7.9.1.1(a)	Monitor and Manage Tank Pressurization and Vent System
7.9.1.1(b)	7.9.1.1(b)	Monitor and Manage Fuel Quantity Indicating System
7.9.1.1(c)	7.9.1.1(c)	Monitor and Manage Fuel Feed Transfer
7.9.1.1(d)	7.9.1.1(d)	Monitor and Compare Fuel Flow Indications
7.9.1.1(e)	7.9.1.1(e)	Monitor and Manage Feed Tank Level
7.9.1.1(f)	7.9.1 1(f)	Monitor and Manage Fuel LO Indication
7.9.1.1(g)	7.9.1.1(g)	Monitor and Manage Bingo Fuel
7.9.1.1(h)	7.9.1.1(h)	Monitor and Manage Tactical Fuel

7.9.10 Monitor and Manage Nav / Ident Systems

7.9.10.1 Tasks Associated with Monitor and Manage Nav / Ident Systems

7.9.10.1(a)	7.9.10.1(a)	Monitor and Manage EGI Equipment
7.9.10.1(b)	7.9.10.1(b)	Monitor and Manage Navigation Aid Equipment

7.9.11 Monitor and Manage Combat Systems

7.9.11.1 Tasks Associated with Monitor and Manage Combat Systems

7.9 11.1(a)	7 9 11.1(a)	Monitor and Manage Radar
7.9 11.1(b)	7.9 11.1(b)	Monitor and Manage Jammers
7 9.11.1(d)	7 9.11.1(d)	Monitor and Manage RWR
7 9 11.1(e)	7 9 11.1(e)	Monitor and Manage AN/ALE-47
7 9 11.1(f)	7.9.11.1(f)	Monitor and Manage IFF Interrogator/Transponder (CIT)
7.9.11.1(g)	7.9.11.1(g)	Monitor and Manage LINK 16/MIDS
7.9.11.1(i)	7.9.11.1(i)	Monitor and Manage Stores Management Set
7.9.11.1(j)	7.9.11.1(j)	Monitor and Manage Weapons
7.9.11.1(k)	7.9.11.1(k)	Monitor and Manage Have Quick II
7 9.11.1(l)	7.9.11.1(l)	Monitor and Manage NVIS

7.9.12 Monitor and Manage Lighting Systems

7.9.12.1 Tasks Associated with Monitor and Manage Lighting Systems

7.9.12.1(a)	7.9.12.1(a)	Monitor and Manage Standard Exterior Lighting
7.9.12.1(b)	7.9.12.1(b)	Monitor and Manage Standard Interior Lighting
7 9.12 1(c)	7.9.12.1(c)	Monitor and Manage NVG Modified Exterior Lighting
7.9.12 1(d)	7.9.12.1(d)	Monitor and Manage NVG Modified Interior Lighting

7.9.13 Monitor and Manage Landing System

7.9.13.1 Tasks Associated with Monitor and Manage Landing System

7.9.13.1(a)	7.9 13.1(a)	Monitor and Manage Landing Gear System
7.9.13.1(b)	7.9.13.1(b)	Monitor and Manage Brake System
7.9.13.1(c)	7.9.13.1(c)	Monitor and Manage Arresting Hook System

7.9.2 Monitor and Manage Hydraulic System

7.9.2.1 Tasks Associated with Monitor and Manage Hydraulic System

7.9.2.1(a)	7.9.2.1(a)	Monitor Hydraulic 1 and 2 Pump Pressure Indicators and Reservoirs
7 9 2.1(b)	7.9 2.1(b)	Monitor and Manage APU and Brake Accumulators

7.9.3 Monitor and Manage Engines

7.9.3.1 Tasks Associated with Monitor and Manage Engines

7.9.3.1(a)	7.9.3.1(a)	Monitor and Manage Engine Performance
7.9.3.1(b)	7.9.3.1(b)	Monitor and Manage Throttle Controls
7.9.3.1(c)	7.9.3.1(c)	Monitor and Manage Engine Anti-Ice System
7.9.3.1(d)	7.9.3.1(d)	Monitor and Manage Automatic Throttle Control (ATC)
7.9.3.1(e)	7.9.3.1(e)	Monitor Inspection of Inlet Duct Doors
7.9.3.1(f)	7.9 3.1(f)	Monitor and Manage Secondary Power Systems

7.9.4 Monitor and Manage Electrical System

7.9.4.1 Tasks Associated with Monitor and Manage Electrical System

7 9 4.1(a).	7 9.4.1(a).	Monitor and Manage Electrical Circuit Breakers
7.9.4.1(b)	7.9.4.1(b)	Monitor and Manage Generators
7.9.4.1(c)	7.9.4.1(c)	Monitor and Manage Transformer Rectifiers
7.9.4.1(d)	7.9.4.1(d)	Monitor and Manage Batteries

7.9.5 Monitor and Manage Flight Control System

7.9.5.1 Tasks Associated with Monitor and Manage Flight Control System

7.9.5.1(a)	7.9.5.1(a)	Monitor and Manage Pilot Controls
7.9.5.1(b)	7.9.5.1(b)	Monitor and Manage Primary Flight Controls
7.9.5.1(c)	7 9.5 1(c)	Monitor and Manage Secondary Flight Controls
7.9.5.1(d)	7 9.5.1(d)	Monitor and Manage FCS Status Display
7.9 5.1(e)	7.9.5.1(e)	Monitor and Manage Departure Warning Tone
7.9.5.1(f)	7.9.5.1(f)	Monitor and Manage Spin Recovery System
7.9.5.1(g)	7.9.5.1(g)	Monitor and Manage Control Augmentation System
7.9 5.1(h)	7.9.5.1(h)	Monitor and Manage Flight Control Computers (FCC)
7.9.5.1(i)	7.9.5.1(i)	Monitor and Manage CAS Backup Systems
7.9.5.1(j)	7.9.5.1(j)	Monitor and Manage Wing Fold System
7.9.5.1(k)	7.9 5.1(k)	Monitor and Manage Automatic Flight Control System

7.9.6 Monitor and Manage Emergency Systems

7.9.6.1 Tasks Associated with Monitor and Manage Emergency Systems

7.9.6.1(a)	7.9.6.1(a)	Monitor and Manage Warning/Caution/Advisory Lights and Display
7.9.6.1(b)	7.9.6.1(b)	Monitor and Manage Master Caution Light and Tone
7.9.6.1(c)	7 9 6 1(c)	Monitor Voice Alert System
7.9.6.1(d)	7.9.6.1(d)	Monitor and Manage GPWS
7.9.6.1(e)	7 9 6.1(e)	Monitor and Manage Fire Detection/Extinguishing System
7.9.6 1(f)	7.9.6.1(f)	Monitor and Manage Canopy System
7.9.6.1(g)	7.9.6.1(g)	Monitor and Manage Ejection Seat System
7.9.6.1(h)	7.9 6.1(h)	Monitor and Manage Life Support Systems

7.9.7 Monitor and Manage Environmental Controls and Oxygen

7.9.7.1 Tasks Associated with Monitor and Manage Environmental Controls and Oxygen

7.9.7.1(a)	7 9.7.1(a)	Monitor and Manage Bleed Air Systems
7.9.7.1(b)	7.9.7.1(b)	Monitor and Manage Windshield Anti-Ice and Rain Removal System
7.9.7.1(c)	7.9.7.1(c)	Monitor and Manage Avionics Cooling and Pressurization
7.9.7.1(d)	7.9.7.1(d)	Monitor and Manage Cockpit Air-Conditioning and Pressurization

7.9.8 Monitor and Manage Flight Instruments

7.9.8.1 Tasks Associated with Monitor and Manage Flight Instruments

7.9.8.1(a)	7.9.8.1(a)	Monitor and Manage Pitot Static System
7 9.8.1(b)	7.9.8.1(b)	Monitor and Manage Standby Instruments
7 9.8.1(c)	7.9.8 1(c)	Monitor and Manage Radar Altimeter
7.9.8.1(d)	7.9.8 1(d)	Monitor and Manage AOA Indexer

	7.9.8.1(e)	7 9.8.1(e)	Monitor and Manage Clock

7.9.9 Monitor and Manage Avionics Sub-Systems

7.9.9.1 Tasks Associated with Monitor and Manage Avionics Sub-Systems

	7.9.9.1(a)	7.9.9.1(a)	Monitor and Manage Mission Computer System
	7.9.9.1(b)	7.9 9.1(b)	Monitor and Manage Cockpit Controls and Displays
	7.9.9 1(c)	7 9.9.1(c)	Monitor and Manage UFC
	7.9.9.7(d)	7.9.9.7(d)	Monitor and Manage CVRS
	7.9.9.7(e)	7.9 9.7(e)	Monitor and Manage Digital Displays VRS

Annex D

Goal Allocation Criteria and Weights

Annex D - CF18 Air to Ground Goal Allocation Criteria and Weights

Boredom	0 012
Complexity	0 051
Computation	0 031
Concept of Ops	0 084
Data Measurement	0 035
Data Sensing	0 057
Dexterity Weight	0 029
Information Availability	0 055
Input Sensitivity	0 061
Intelligence	0 053
Memory	0 055
Mobility	0 011
Pattern Recognition	0 074
Power	0 013
Problem Solving	0 057
Reasoning	0 066
Reliability	0 051
Response Time	0 047
Situational Awareness	0 059
Technical Risk or Cost	0 027
Verbal Task	0 073

Annex E

Goal Allocation

Annex E - CF18 Air to Ground Goal Allocation

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 5 2 2(d)	Initiate and Monitor EID of Unknowns	-0 217	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 9 1(a)	Monitor and Manage Mission Computer System	-0 194	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 10 1(a)	Monitor and Manage EGI Equipment	-0 182	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 5 1(e)	Monitor and Manage Departure Warning Tone	-0 147	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 5 1(f)	Monitor and Manage Spin Recovery System	-0 137	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 11 1(f)	Monitor and Manage IFF Interrogator/Transponder (CIT)	-0 135	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 5 1(c)	Monitor and Manage Secondary Flight Controls	-0 133	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 5 1(b)	Monitor and Manage Primary Flight Controls	-0 133	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 5 1(h)	Monitor and Manage Flight Control Computers (FCC)	-0 133	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 2 1 1(a)	Reduce Aircraft Emissions (EMCON Procedures)	-0 132	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 6 1(a)	Monitor and Manage Warning/Caution/Advisory Lights and Displays	-0 129	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 7 1(d)	Monitor and Manage Cockpit Air-Conditioning and Pressurization	-0 123	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 6 1(e)	Monitor and Manage Fire Detection/Extinguishing System	-0 114	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 2 2 2(h)	Conduct Self-Lasing LGB Delivery	-0 108	Human		Mandatory

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 9 6 1(d)	Monitor and Manage GPWS	-0 108	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 6 1(g)	Monitor and Manage Ejection Seat System	-0 102	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 2 7 2(g)	Interrogate Unknown AMIRS Contacts with IFF	-0 102	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 2 7 1(g)	Interrogate Unknown Radar Contacts with IFF	-0 102	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 2 2.2(j)	Update Target Designation	-0 102	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 1 5 1(b)	Establish Radar Contact with AAR	-0 102	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 1 4 2(i)	Establish AMIRS Contact with Naval Ships	-0 102	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 1 1 2(g)	Establish AMIRS Contact with Other Mission Elements	-0 102	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 1 1 2(a)	Establish Radar Contact with Other Mission Elements	-0 102	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 3 1(d)	Monitor and Manage Automatic Throttle Control (ATC)	-0 100	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 5 1(i)	Monitor and Manage CAS Backup Systems	-0 086	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 5 1(g)	Monitor and Manage Control Augmentation System	-0 086	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 5 1(d)	Monitor and Manage FCS Status Display	-0 086	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 1 1(f)	Monitor and Manage Fuel LO Indication	-0 082	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 2 2 2(i)	Conduct Buddy-Lasing LGB Delivery	-0 081	Human		Mandatory

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 9 11 1(g)	Monitor and Manage LINK 16/MIDS	-0 080	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 4 1(c)	Monitor and Manage Transformer Rectifiers	-0 078	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 7 1(a)	Monitor and Manage Bleed Air Systems	-0 078	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 2 1(a)	Monitor Hydraulic 1 and 2 Pump Pressure Indicators and Reservoirs	-0 078	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 7 1(b)	Monitor and Manage Windshield Anti-Ice and Rain Removal System	-0 078	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 1 1(c)	Monitor and Manage Fuel Feed Transfer	-0 078	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 7 1(c)	Monitor and Manage Avionics Cooling and Pressurization	-0 078	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 3 1(f)	Monitor and Manage Secondary Power Systems	-0 078	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 4 1(b)	Monitor and Manage Generators	-0 078	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 4 1(d)	Monitor and Manage Batteries	-0.078	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 8 1(a)	Monitor and Manage Pitot Static System	-0 078	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 11 1(k)	Monitor and Manage Have Quick II	-0 070	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 6 1(b)	Monitor and Manage Master Caution Light and Tone	-0 068	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 1 5 1(f)	Establish AMIRS Contact With AAR	-0 067	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 6 1(h)	Monitor and Manage Life Support Systems	-0 066	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 9 4 1(a)	Monitor and Manage Electrical Circuit Breakers	-0 066	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 6 1(f)	Monitor and Manage Canopy System	-0 055	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 9 1(c)	Monitor and Manage UFC	-0 051	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 8 1(d)	Monitor and Manage AOA Indexer	-0 049	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 5 2 2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays	-0 049	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 2 1(b)	Monitor and Manage APU and Brake Accumulators	-0 047	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 9 7(d)	Monitor and Manage CVRS	-0 043	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 9 7(e)	Monitor and Manage Digital Displays VRS	-0 043	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 5 1(k)	Monitor and Manage Automatic Flight Control System	-0 043	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 8 3 1(b)	Monitor Secure LINK 16 Frequencies	-0 039	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 13 1(b)	Monitor and Manage Brake System	-0 024	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 13 1(c)	Monitor and Manage Arresting Hook System	-0 024	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 11 1(d)	Monitor and Manage RWR	-0 024	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 3 1(a)	Monitor and Manage Engine Performance	-0 008	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 1 1(a)	Monitor and Manage Tank Pressurization and Vent System	-0 004	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 9 11 1(b)	Monitor and Manage Jammers	-0 002	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 7 2 1(f)	Limit Exposure Using Terrain Masking	0 000	Human		Mandatory
7 2 2 2(c)	Identify Target Area with Aircraft Sensors	0 000	Human		Mandatory
7 7 5 1(b)	Employ Low Speed Flight	0 000	Human		Mandatory
7 9 5 1(a)	Monitor and Manage Pilot Controls	0 000	Human		Mandatory
7 9 3.1(e)	Monitor Inspection of Inlet Duct Doors	0 000	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 9 3 1(c)	Monitor and Manage Engine Anti-Ice System	0 000	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 3 2 2(c)	Find Target Visually	0 000	Human		Mandatory
7 5 2 7(c)	Employ Weapons	0 000	Human		Mandatory
7 2 2 2(g)	Deliver PGM (LGB/MAV/Adv PGM)	0 000	Human		Mandatory
7 5 2 5(a)	Deny Enemy Air Weapons Solution	0 000	Human		Mandatory
7 3 2 2(h)	Find Target with NVG	0 000	Human		Mandatory
7 9 3 1(b)	Monitor and Manage Throttle Controls	0 000	Human		Mandatory
7 5 2 5(b)	Negate Enemy Air Weapons Employment	0 000	Human		Mandatory
7 2 4 1(a)	Pass IFREP	0 000	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 5 2 2(p)	VID Unknowns with NVG	0 000	Human		Mandatory
7 2 2 1(h)	Deliver GP Weapons(Bombs/Rx/Cluster/Gx)	0 000	Human		Mandatory
7 5 2 4(e)	Negate Enemy Air Weapons Employment	0 000	Human		Mandatory
7 5 2 2(f)	Advise on Visually Acquired Threats	0 000	Human		Mandatory
7 2 2 2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16	0 000	Human		Mandatory
7 9 5 1(j)	Monitor and Manage Wing Fold System	0 000	Machine	Human	Re-Allocated by Analyst to reflect Human Role in monitoring the machine function
7 5 2 2(h)	VID Unknowns	0 000	Human		Mandatory
7 9 11 1(i)	Monitor and Manage Stores Management Set	0 002	Human		Weighted Sum
7 3 2 1(e)	Communicate with FAC via DATA LINK 16	0 011	Human		Weighted Sum
7 9 13 1(a)	Monitor and Manage Landing Gear System	0 011	Human		Weighted Sum
7 1 4 2(f)	Deploy to CAP	0 016	Human		Weighted Sum
7 1 4 2(e)	Establish Radar Contact with Naval Ships	0.023	Human		Weighted Sum
7 9 1 1(b)	Monitor and Manage Fuel Quantity Indicating System	0 023	Human		Weighted Sum
7 2 2 1(c)	Designate/Add Offset at Initial Point	0 025	Human		Weighted Sum
7 9 9 1(b)	Monitor and Manage Cockpit Controls and Displays	0 028	Human		Weighted Sum

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 9 11 1(j)	Monitor and Manage Weapons	0 029	Human		Weighted Sum
7 2 6 2(c)	Perform Navigation Systems Designations/Updates	0 033	Human		Weighted Sum
7 9 6 1(c)	Monitor Voice Alert System	0 034	Human		Weighted Sum
7 1 5 1(g)	Establish NVG Contact with AAR	0 037	Human		Weighted Sum
7 9 11 1(l)	Monitor and Manage NVIS	0 039	Human		Weighted Sum
7 9 1 1(e)	Monitor and Manage Feed Tank Level	0 043	Human		Weighted Sum
7 5 2 4(b)	Illuminate Enemy Air RWR	0 043	Human		Weighted Sum
7 2 3 2(b)	Egress at Low Altitude	0 051	Human		Weighted Sum
7 2 3 2(c)	Egress at Medium/High Altitude	0 051	Human		Weighted Sum
7 9 11 1(a)	Monitor and Manage Radar	0 052	Human		Weighted Sum
7 9 8 1(e)	Monitor and Manage Clock	0 059	Human		Weighted Sum
7 9 11 1(e)	Monitor and Manage AN/ALE-47	0 069	Human		Weighted Sum
7 6 4 1(b)	Request Clearance to Depart	0 073	Human		Weighted Sum
7 9 1 1(d)	Monitor and Compare Fuel Flow Indications	0 074	Human		Weighted Sum
7 6 2 1(b)	Maintain Positive Closure	0 075	Human		Weighted Sum

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 6 2 1(a)	Generate Positive Closure	0 075	Human		Weighted Sum
7 4 2 2(a)	Report Target via LINK 16/MIDS Secure Communications	0 076	Human		Weighted Sum
7 9 12 1(d)	Monitor and Manage NVG Modified Interior Lighting	0 081	Human		Weighted Sum
7 9 12 1(c)	Monitor and Manage NVG Modified Exterior Lighting	0 081	Human		Weighted Sum
7 9 10 1(b)	Monitor and Manage Navigation Aid Equipment	0 082	Human		Weighted Sum
7 4 2 1(c)	Acquire Enemy Targets on LINK 16/MIDS Displays	0 082	Human		Weighted Sum
7 1 1 3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	0 083	Human		Weighted Sum
7 1 4 2(l)	Establish NVG Contact with Naval Ships	0 084	Human		Weighted Sum
7 1 1 2(h)	Establish NVG Contact with Other Mission Elements	0 084	Human		Weighted Sum
7 9 8 1(b)	Monitor and Manage Standby Instruments	0 085	Human		Weighted Sum
7 9 12 1(a)	Monitor and Manage Standard Exterior Lighting	0 085	Human		Weighted Sum
7 9 12 1(b)	Monitor and Manage Standard Interior Lighting	0 085	Human		Weighted Sum
7 6 3 1(a)	Generate Maximum Fuel Transfer	0 090	Human		Weighted Sum
7 9 8 1(c)	Monitor and Manage Radar Altimeter	0 092	Human		Weighted Sum
7 2 7 1(f)	Radar Sort Multiple Unknown Contacts	0 095	Human		Weighted Sum

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 2 7 2(f)	Sort Multiple Unknown Contacts with AMIRS	0 095	Human		Weighted Sum
7 3 2 1(c)	Enter Target Location in Aircraft database	0 099	Human		Weighted Sum
7 1 1 1(b)	Conduct TRP Hold	0 102	Human		Weighted Sum
7 2 1 1(b)	Ingress at Low Altitude (Sophisticated Environment)	0 102	Human		Weighted Sum
7 2 1 1(c)	Ingress at Medium/High Altitude (Permissive Environment)	0 102	Human		Weighted Sum
7 2 1 1(d)	Descend to Low Altitude (Sophisticated Environment)	0 102	Human		Weighted Sum
7 2 1 1(e)	Adjust to Medium/High Altitude (Permissive Environment)	0 102	Human		Weighted Sum
7 8 1 1(a)	Monitor Common Secure Voice Frequencies	0 108	Human		Weighted Sum
7 1 5 1(c)	Establish Communications with AAR	0 116	Human		Weighted Sum
7 1 1 2(b)	Establish Communications with Other Mission Elements	0 116	Human		Weighted Sum
7 1 1 2(c)	Establish Communications with Controlling Agency	0 116	Human		Weighted Sum
7 5 2 4(c)	Enhance Enemy Air Radar Acquisition	0 117	Human		Weighted Sum
7 2 7 2(a)	Monitor and Maintain Assigned AMIRS Search Parameters	0 121	Human		Weighted Sum
7 1 1 2(e)	Confirm Friendly Force and Adversary Disposition on LINK 16/MIDS	0 121	Human		Weighted Sum
7 3 2 2(f)	Conduct Target Run In	0 124	Human		Weighted Sum

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 2 2 1(k)	Conduct BDA	0 125	Human		Weighted Sum
7 1 5 2(a)	Conduct AAR Sensors to Visual Intercept	0 130	Human		Weighted Sum
7 7 5 1(a)	Employ High Speed Flight	0 136	Human		Weighted Sum
7 6 3 3(a)	Generate Negative Closure	0 139	Human		Weighted Sum
7 2 2 1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays	0 139	Human		Weighted Sum
7 1 1 2(f)	Establish Visual Contact with Other Mission Elements	0 141	Human		Weighted Sum
7 1 5 1(e)	Establish Visual Contact with AAR	0 141	Human		Weighted Sum
7 1 4 2(g)	Establish Visual Contact with Naval Ships	0 141	Human		Weighted Sum
7 2 2 1(g)	Validate Weapons Solution Display	0 143	Human		Weighted Sum
7 2 7 1(b)	Monitor and Maintain Radar Contact with Formation Members	0 146	Human		Weighted Sum
7 2 7 2(b)	Monitor and Maintain AMIRS Contact with Formation Members	0 146	Human		Weighted Sum
7 2 7 1(d)	Monitor and Maintain Radar Contact with Unknowns	0 146	Human		Weighted Sum
7 2 7 1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements	0 146	Human		Weighted Sum
7 2 7 2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elements	0 146	Human		Weighted Sum
7 2 7 2(d)	Monitor and Maintain AMIRS Contact with Unknowns	0 146	Human		Weighted Sum

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 7 2 1(b)	Avoid Illuminating of the Enemy Air RWR	0 148	Human		Weighted Sum
7 4 2 2(b)	Report Target via Have Quick II Secure Communications	0 149	Human		Weighted Sum
7 3 2 2(d)	Communicate Target Acquired	0 157	Human		Weighted Sum
7 1 1 3(c)	Conduct Formation Join-up	0 159	Human		Weighted Sum
7 3.2 2(a)	Receive Target Description Brief from FAC	0 159	Human		Weighted Sum
7 2 7 2(e)	Advise on AMIRS Acquired Unknowns	0 159	Human		Weighted Sum
7 2 7 3(e)	Advise on Visually Acquired Unknowns	0 159	Human		Weighted Sum
7 2 7 1(e)	Advise on Radar Acquired Unknowns	0 159	Human		Weighted Sum
7 2 2 1(d)	Manoeuvre to Weapons Delivery Parameters	0 163	Human		Weighted Sum
7 1 1 1(a)	Identify TRP	0 167	Human		Weighted Sum
7 2 7 1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters	0 168	Human		Weighted Sum
7 2 3 2(d)	Conduct Lame Duck Procedures	0 168	Human		Weighted Sum
7 6 2 2(a)	Position Pitch Ladders	0 172	Human		Weighted Sum
7 1 5 2(f)	Conduct AAR Sensors to NVG Intercept	0 181	Human		Weighted Sum
7 5 2 5(c)	Employ Air-to-Air RMD	0 182	Human		Weighted Sum

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 6 3 3(c)	Move to Astern Position	0 183	Human		Weighted Sum
7 6 3 3(e)	Move to Outboard / Echelon Position	0 183	Human		Weighted Sum
7 6 4 1(a)	Establish Departure Echelon Position	0 183	Human		Weighted Sum
7 6 2 3(c)	Make Contact	0 183	Human		Weighted Sum
7 6 2 2(b)	Align Probe	0 183	Human		Weighted Sum
7 3 2 1(a)	Copy Target Brief from FAC	0 183	Human		Weighted Sum
7 3 2 1(b)	Read Back Mandatory Items to FAC	0 184	Human		Weighted Sum
7 6 4 1(c)	Depart	0 185	Human		Weighted Sum
7 6 2 1(c)	Monitor and Obey AAR Lights	0 185	Human		Weighted Sum
7 1 1 1(c)	Search for TRP	0 185	Human		Weighted Sum
7 2 2 1(f)	Conduct Element Split Attacks	0 186	Human		Weighted Sum
7 1 4 1(f)	Confirm Positive Radar Identification by Naval Controlling Agency	0 189	Human		Weighted Sum
7 6 2 3(a)	Pick Approach Reference	0 196	Human		Weighted Sum
7 2 6 1(d)	Monitor and Avoid ACO Restricted Areas	0 203	Human		Weighted Sum
7 2 6 1(b)	Adhere to ACO	0 203	Human		Weighted Sum

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 2 4 2(b)	Conduct Fence Out Check	0 207	Human		Weighted Sum
7 2 6 2(f)	Navigate Using NVG Visual References	0 212	Human		Weighted Sum
7 2 7 1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays	0 213	Human		Weighted Sum
7 8 1 1(c)	Monitor Broadcast Frequencies	0 218	Human		Weighted Sum
7 7 2 1(d)	Establish Diverging Paths	0 220	Human		Weighted Sum
7 6 2 3(b)	Maintain Attitude References	0 227	Human		Weighted Sum
7 4 2 1(e)	Utilize Lateral Mission Element Tactical Information	0 233	Human		Weighted Sum
7 2 7 3(f)	Maintain NVG Visual Search Patterns	0.234	Human		Weighted Sum
7 4 2 1(f)	Find Target with AMIRS Search Sort and Target Contract	0 234	Human		Weighted Sum
7 5 2 7(g)	Monitor Weapon Fly Out	0 236	Human		Weighted Sum
7 7 6 3(a)	Employ Surface-to-Air RMD	0 237	Human		Weighted Sum
7 1 5 1(d)	Conduct Pre AAR RV Checks	0 238	Human		Weighted Sum
7 1 5 2(e)	Conduct Pre-Contact AAR Checks	0 238	Human		Weighted Sum
7 2 2 2(b)	Designate Target Position	0 239	Human		Weighted Sum
7 2 2 1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections	0 239	Human		Weighted Sum

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 2 4 2(a)	Conduct BD Check	0 241	Human		Weighted Sum
7 2 2 1(a)	Conduct A/G Check	0 242	Human		Weighted Sum
7 1 2 1(e)	Get Initial Target Brief	0 246	Human		Weighted Sum
7 2 6 2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs	0 251	Human		Weighted Sum
7 1 5 2(b)	Adopt AAR Towline Waiting Position	0 258	Human		Weighted Sum
7 1 5 2(c)	Join In Echelon Position	0 258	Human		Weighted Sum
7 1 5 2(d)	Position Astern AAR Hoses	0 258	Human		Weighted Sum
7 2 6 1(c)	Adjust G/S to Make Tasking Timings	0.259	Human		Weighted Sum
7 2 6 1(a)	Maintain Ground Track	0 262	Human		Weighted Sum
7 2 2 1(n)	Search for Initial Point	0 262	Human		Weighted Sum
7 2 2 1(o)	Search for Target	0 262	Human		Weighted Sum
7 2 5 1(a)	Establish Tactical Roles - Tactical Leads and Wingmen	0.267	Human		Weighted Sum
7 3 2 2(b)	Find Target Using Sensors	0 267	Human		Weighted Sum
7 1 4 1(c)	Conduct Weapons Check-In with Controlling Agency	0 273	Human		Weighted Sum
7 2.6 2(e)	Arrive at Target at Predetermined TOT	0 276	Human		Weighted Sum

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 2 5 2(a)	Optimize Formation for Tactical Situation	0 277	Human		Weighted Sum
7 5 2 3(c)	Employ Jammers	0 278	Human		Weighted Sum
7 2 2 1(p)	Identify Initial Point with NVG	0 280	Human		Weighted Sum
7 2 2 1(b)	Identify Initial Point Visually	0 280	Human		Weighted Sum
7 2 7 3(a)	Maintain Visual Search Patterns	0 291	Human		Weighted Sum
7 2 5 2(b)	Maintain Visual Mutual Support	0 291	Human		Weighted Sum
7 4 2 1(d)	Find Target with Radar Search Sort and Target Contract	0 291	Human		Weighted Sum
7 3 2 2(e)	Describe Target Area and Target to FAC	0 292	Human		Weighted Sum
7 2 2 1(j)	Conduct Frag Avoidance Manoeuvre	0 296	Human		Weighted Sum
7 2 2 1(i)	Conduct Safe Escape Manoeuvre	0 296	Human		Weighted Sum
7 7 2 1(e)	React Aggressively to Enemy Air Manoeuvre	0 298	Human		Weighted Sum
7 2 6 2(d)	Employ Watch Map Ground Technique	0 299	Human		Weighted Sum
7 2 5 2(c)	Maintain Positional Mutual Support	0 309	Human		Weighted Sum
7 2 5 2(g)	Communicate with Formation Members via Data Link	0 315	Human		Weighted Sum
7 2 5 2(e)	Maintain Visual Mutual Support with NVG	0 318	Human		Weighted Sum

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 1 1 2(d)	Get Tactical Update and Area Brief	0 320	Human		Weighted Sum
7 9 1 1(g)	Monitor and Manage Bingo Fuel	0 320	Human		Weighted Sum
7 5 2 5(e)	Employ AAGD	0 321	Human		Weighted Sum
7 7 5 1(c)	Avoid Threat Envelopes	0 330	Human		Weighted Sum
7 4 2 1(g)	Conduct Visual Lookout with NVG	0 343	Human		Weighted Sum
7 5 2 3(b)	Dispense Chaff	0 344	Human		Weighted Sum
7 2 7 3(g)	Monitor and Maintain NVG Contact with Formation Members	0.347	Human		Weighted Sum
7 2 7 3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements	0 347	Human		Weighted Sum
7 2 7 3(i)	Monitor and Maintain NVG Contact with Unknowns	0 347	Human		Weighted Sum
7 4 2 1(a)	Conduct Visual Lookout	0 347	Human		Weighted Sum
7 4 2 1(b)	Respond to displayed RWR Threat Emission Information	0 355	Human		Weighted Sum
7 5 2 6(a)	Manoeuvre Aircraft to Intercept Enemy	0 357	Human		Weighted Sum
7 2 5 1(b)	Maintain Aircraft Control and Flight Position	0 369	Human		Weighted Sum
7 5 2 7(a)	Manoeuvre to a Weapons Engagement Zone	0 377	Human		Weighted Sum
7 7 6 1(b)	Employ Defensive Counter Measures	0 377	Human		Weighted Sum

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 7 5 3(b)	Employ Atmospheric Phenomena	0 386	Human		Weighted Sum
7 2 6 2(a)	Navigate Using Visual References	0 394	Human		Weighted Sum
7 2 5 1(c)	Execute Manoeuvre Turns	0 400	Human		Weighted Sum
7 2 7 3(d)	Monitor and Maintain Visual Contact with Unknowns	0 404	Human		Weighted Sum
7 2 7 3(b)	Monitor and Maintain Visual Contact with Formation Members	0 404	Human		Weighted Sum
7 2 7 3(c)	Monitor and Maintain Visual Contact with Lateral Mission Elements	0 404	Human		Weighted Sum
7 2 5 2(f)	Communicate with Formation Members via Discreet Frequency	0 406	Human		Weighted Sum
7 5 2 5(d)	Employ Air-to-Air IRMD	0 423	Human		Weighted Sum
7 7 6 3(b)	Employ Surface-to-Air IRMD	0 423	Human		Weighted Sum
7 2 6 3(c)	Monitor and Avoid Terrain	0 426	Human		Weighted Sum
7 5 2 4(a)	Manoeuvre/Expose the Tactical Formation	0 436	Human		Weighted Sum
7 7 3 6(1)	Jettison External Stores	0 452	Human		Weighted Sum
7 7 2 1(a)	Manoeuvre the Tactical Formation	0 463	Human		Weighted Sum
7 7 2 1(c)	Configure the Tactical Formation	0 463	Human		Weighted Sum
7 5 2 2(a)	Employ Radar Search Sort and Target Contract	0 466	Human		Weighted Sum

Goal ID	Goal Label	Weighted Sum	Allocation	Qualitative Allocation	Rationale
7 5 2 2(l)	Employ AMIRS Search Sort and Target Contract	0 466	Human		Weighted Sum
7 5 2 3(a)	Employ Tactical Deception	0 509	Human		Weighted Sum
7 5 2 5(f)	Egress Engagement Safely	0 511	Human		Weighted Sum
7 5 2 7(d)	Maintain Post Attack Offensive	0 511	Human		Weighted Sum
7 5 2 3(d)	Employ BVR Deception Tactics	0 511	Human		Weighted Sum
7 5 2 4(d)	Draw Enemy Air Away	0 511	Human		Weighted Sum
7 5 2 1(b)	Conduct CAP	0 522	Human		Weighted Sum
7 5 2 7(f)	Assess Post Merge ACM Options	0 548	Human		Weighted Sum
7 5 2 2(e)	Advise on Approaching Threats	0 550	Human		Weighted Sum
7 4 2 2(c)	Utilize C2 Directive and Descriptive Commentary	0 558	Human		Weighted Sum
7 2 6 3(a)	Monitor and Avoid Weather	0 563	Human		Weighted Sum
7 2 6 3(b)	Monitor and Avoid Obstacles	0 563	Human		Weighted Sum
7 2 6 3(e)	Monitor and Avoid Other Aircraft	0 563	Human		Weighted Sum
7 9 1 1(h)	Monitor and Manage Tactical Fuel	0 622	Human		Weighted Sum

Annex F

Goal Inventory with Completion Times

Annex F - CF18 Air to Ground Goal Inventory With Completion Times

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.1 1 1(a)	7.1.1.1(a)	Identify TRP	10
7.1.1.1(b)	7.1.1.1(b)	Conduct TRP Hold	300
7.1 1 1(c)	7.1.1.1(c)	Search for TRP	20
7 1.1.2(a)	7.1.1.2(a)	Establish Radar Contact with Other Mission Elements	20
7.1.1.2(b)	7 1 1.2(b)	Establish Communications with Other Mission Elements	12
7.1.1.2(c)	7.1.1.2(c)	Establish Communications with Controlling Agency	15
7.1.1.2(d)	7.1.1.2(d)	Get Tactical Update and Area Brief	15
7.1 1.2(e)	7.1.1.2(e)	Confirm Friendly Force and Adversary Disposition on LINK 16/MI	10
7.1.1.2(f)	7.1.1.2(f)	Establish Visual Contact with Other Mission Elements	10
7.1.1.2(g)	7.1.1.2(g)	Establish AMIRS Contact with Other Mission Elements	10
7 1 1.2(h)	7 1.1.2(h)	Establish NVG Contact with Other Mission Elements	10
7 1.1.3(a)	7.1.1.2(a)	Establish Radar Contact with Other Formation Members	20
7 1 1 3(b)	7 1.1.2(b)	Establish Communications with Other Formation Members	12
7.1.1.3(c)	7.1.1.3(c)	Conduct Formation Join-up	60
7.1.1.3(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.1.1.3(e)	7.1.1.2(f)	Establish Visual Contact with Other Formation Members	10
7.1.1.3(f)	7.1.1.2(g)	Establish AMIRS Contact with Other Formation Members	10
7 1.1.3(g)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members	10
7 1.1.3(h)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position	999
7 1.2 1(a)	7 1.1.2(a)	Establish Radar Contact with Other Mission Elements	20
7.1.2.1(b)	7.1.1.2(c)	Establish Communications with Controlling Agency (ABCCC/AWA	15
7.1.2.1(c)	7.1.1.2(b)	Establish Communications with Forward Air Controller (FAC)	12
7.1.2.1(d)	7.1.1.2(d)	Get Tactical Update and Area Brief	15
7.1.2.1(e)	7.1 2.1(e)	Get Initial Target Brief	30
7.1 2.1(f)	7.1.1.2(f)	Establish Visual Contact with Other Mission Elements	10
7 1 2 1(g)	7.1.1.2(g)	Establish AMIRS Contact with Other Mission Elements	10
7 1 2.1(h)	7.1.1.2(h)	Establish NVG Contact with Other Mission Elements	10

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.1.2.2(a)	7.1.1.2(a)	Establish Radar Contact with Other Formation Members	20
7.1.2.2(b)	7.1.1.2(b)	Establish Communications with Other Formation Members	12
7.1.2.2(c)	7.1.1.3(c)	Conduct Formation Join-up	60
7.1 2.2(d)	7.1 1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.1 2 2(e)	7.1 1 2(f)	Establish Visual Contact with Other Formation Members	10
7 1 2.2(f)	7.1 1.2(g)	Establish AMIRS Contact with Other Formation Members	10
7 1.2.2(g)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members	10
7.1 2.2(h)	7 2.5.1(b)	Maintain Aircraft Control and Flight Position	999
7 1.3 1(a)	7 1.1.1(a)	Identify TRP	10
7.1.3.1(b)	7 1.1.1(b)	Establish TRP Hold	300
7.1.3 1(c)	7.1.1 1(c)	Search for TRP	20
7.1 3 2(a)	7 1.1 2(a)	Establish Radar Contact with Other Mission Elements	20
7.1.3 2(b)	7.1.1 2(b)	Establish Communications with Other Mission Elements	12
7.1.3.2(c)	7.1.1 2(c)	Establish Communications with Controlling Agency	15
7 1 3.2(d)	7.1 1.2(d)	Get Tactical Update and Area Brief	15
7.1.3.2(e)	7.1.1.2(e)	Confirm Friendly Force and Adversary Disposition on LINK 16/MI	10
7.1.3.2(f)	7.1.1.2(f)	Establish Visual Contact with Other Mission Elements	10
7.1.3.2(g)	7.1.1.2(g)	Establish AMIRS Contact with Other Mission Elements	10
7.1.3.2(h)	7.1.1.2(h)	Establish NVG Contact with Other Mission Elements	10
7.1.3.3(a)	7 1.1.2(a)	Establish Radar Contact with Other Formation Members	20
7.1.3.3(b)	7 1.1.2(b)	Establish Communications with Other Formation Members	12
7.1.3.3(c)	7.1.1.3(c)	Conduct Formation Join-up	60
7 1 3 3(d)	7.1.1 3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.1.3 3(e)	7.1.1.2(f)	Establish Visual Contact with Other Formation Members	10
7.1.3 3(f)	7.1.1.2(g)	Establish AMIRS Contact with Other Formation Members	10
7 1 3.3(g)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members	10
7.1 3.3(h)	7 2.5.1(b)	Maintain Aircraft Control and Flight Position	999
7 1 4.1(a)	7.1.1.2(a)	Establish Radar Contact with Other Mission Elements	20
7.1.4.1(b)	7.1.1 2(b)	Establish Communications with Other Mission Elements	12
7 1.4.1(c)	7 1.4.1(c)	Conduct Weapons Check-In with Controlling Agency	10

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.1.4.1(d)	7.1.1.2(d)	Get Tactical Update and Area Brief	15
7.1.4.1(e)	7.1.1.2(e)	Confirm Friendly Force and Adversary Disposition on Link 16/MID	10
7.1.4.1(f)	7.1.4.1(f)	Confirm Positive Radar Identification by Naval Controlling Agency	10
7 1.4.1(g)	7.1 1.2(f)	Establish Visual Contact with Other Mission Elements	10
7.1.4.1(h)	7.1.1.2(g)	Establish AMIRS Contact with Other Mission Elements	10
7 1.4.1(ı)	7.1 1 2(h)	Establish NVG Contact with Other Mission Elements	10
7.1 4 2(a)	7.1.1.2(a)	Establish Radar Contact with Other Formation Members	20
7.1.4 2(b)	7.1.1 2(b)	Establish Communications with Other Formation Members	12
7.1.4.2(c)	7.1.1.3(c)	Conduct Formation Join-up	60
7 1 4.2(d)	7.1.1 3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.1.4.2(e)	7.1.4.2(e)	Establish Radar Contact with Naval Ships	20
7.1.4 2(f)	7.1.4.2(f)	Deploy to CAP	20
7.1.4.2(g)	7.1.4.2(g)	Establish Visual Contact with Naval Ships	10
7 1.4 2(h)	7.1.1.2(g)	Establish AMIRS Contact with Other Formation Members	10
7.1.4.2(ı)	7.1.4.2(i)	Establish AMIRS Contact with Naval Ships	15
7 1.4.2(j)	7.1.1.2(f)	Establish Visual Contact with Other Formation Members	10
7 1.4 2(k)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members	10
7 1.4 2(l)	7.1.4.2(l)	Establish NVG Contact with Naval Ships	10
7.1.4.2(m)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position	999
7.1.5.1(a)	7 1.1.2(e)	Confirm Friendly Force and Adversary Disposition on LINK 16/MI	10
7.1.5.1(b)	7.1.5.1(b)	Establish Radar Contact with AAR	15
7.1.5.1(c)	7 1.5.1(c)	Establish Communications with AAR	10
7.1.5.1(d)	7 1.5.1(d)	Conduct Pre AAR RV Checks	15
7.1.5 1(e)	7.1.5.1(e)	Establish Visual Contact with AAR	10
7.1.5.1(f)	7 1.5.1(f)	Establish AMIRS Contact With AAR	10
7.1.5.1(g)	7.1.5.1(g)	Establish NVG Contact with AAR	10
7.1.5.2(a)	7.1.5.2(a)	Conduct AAR Sensors to Visual Intercept	300
7.1 5.2(b)	7.1.5.2(b)	Adopt AAR Towline Waiting Position	30
7 1 5.2(c)	7.1.5.2(c)	Join In Echelon Position	60
7.1.5.2(d)	7.1.5.2(d)	Position Astern AAR Hoses	20

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.1.5.2(e)	7.1 5.2(e)	Conduct Pre-Contact AAR Checks	15
7 1.5 2(f)	7.1.5.2(f)	Conduct AAR Sensors to NVG Intercept	300
7 1.5 2(g)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position	999
7 1.6.1(a)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters	3
7.1.6.1(b)	7.2.7.1(b)	Monitor and Maintain Radar Contact with Formation Members	4
7.1.6.1(c)	7.2.7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements	4
7.1.6.1(d)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns	5
7.1.6.1(e)	7.2.7.1(e)	Advise on Radar Acquired Unknowns	10
7.1.6 1(f)	7.2.7.1(f)	Radar Sort Multiple Unknown Contacts	30
7 1 6 1(g)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF	15
7 1 6 1(h)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays	5
7.1.6.2(a)	7.2.7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters	2
7.1.6.2(b)	7.2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members	4
7.1.6.2(c)	7.2.7 2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elemer	4
7.1 6 2(d)	7.2.7.2(d)	Monitor and Maintain AMIRS Contact with Unknowns	5
7.1.6.2(e)	7.2.7.2(e)	Advise on AMIRS Acquired Unknowns	10
7.1.6.2(f)	7.2.7.2(f)	Sort Multiple Unknown Contacts with AMIRS	30
7.1.6.2(g)	7.2.7.2(g)	Interrogate Unknown AMIRS Contacts with IFF	15
7.1.6.3(a)	7.2.7.3(a)	Maintain Visual Search Patterns	5
7.1.6.3(b)	7.2.7.3(b)	Monitor and Maintain Visual Contact with Formation Members	2
7.1.6.3(c)	7.2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element	2
7.1.6.3(d)	7.2.7.3(d)	Monitor and Maintain Visual Contact with Unknowns	5
7.1.6.3(e)	7.2.7 3(e)	Advise on Visually Acquired Unknowns	15
7.1.6.3(f)	7.2.7.3(f)	Maintain NVG Visual Search Patterns	7
7.1.6.3(g)	7.2 7.3(g)	Monitor and Maintain NVG Contact with Formation Members	7
7.1.6.3(i)	7.2.7.3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements	7
7 1.6.3(j)	7 2.7.3(i)	Monitor and Maintain NVG Contact with Unknowns	7
7 2.1 1(a)	7.2.1.1(a)	Reduce Aircraft Emissions (EMCON Procedures)	7
7.2.1.1(b)	7 2 1.1(b)	Ingress at Low Altitude (Sophisticated Environment)	999
7 2.1.1(c)	7.2.1.1(c)	Ingress at Medium/High Altitude (Permissive Environment)	999

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.2.1.1(d)	7.2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)	30
7.2.1.1(e)	7.2.1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)	30
7 2.2.1(a)	7.2 2.1(a)	Conduct A/G Check	15
7.2.2.1(b)	7.2.2.1(b)	Identify Initial Point Visually	5
7.2.2.1(c)	7.2.2.1(c)	Designate/Add Offset at Initial Point	25
7.2.2.1(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters	30
7.2 2 1(e)	7.2.2.1(b)	Identify Target/DMPI Visually	5
7.2 2 1(f)	7.2.2.1(f)	Conduct Element Split Attacks	70
7.2.2.1(g)	7.2.2.1(g)	Validate Weapons Solution Display	2
7 2.2 1(h)	7 2.2.1(h)	Deliver GP Weapons(Bombs/Rx/Cluster/Gx)	3
7 2.2.1(i)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre	15
7 2.2.1(j)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre	15
7 2.2.1(k)	7.2.2.1(k)	Conduct BDA	5
7.2.2.1(l)	7 2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections	120
7.2.2.1(m)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays	5
7 2.2.1(n)	7.2.2.1(n)	Search for Initial Point	10
7.2.2 1(o)	7.2.2.1(o)	Search for Target	4
7 2 2.1(p)	7.2.2.1(p)	Identify Initial Point with NVG	5
7 2.2.1(q)	7.2.2.1(p)	Identify Target/DMPI with NVG	5
7.2.2.2(a)	7.2.2.1(a)	Conduct A/G Check	15
7 2.2.2(b)	7.2.2.2(b)	Designate Target Position	25
7.2.2.2(c)	7.2.2.2(c)	Identify Target Area with Aircraft Sensors	10
7.2.2 2(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters	30
7 2.2 2(e)	7 2.2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16	10
7.2.2 2(f)	7.2.2.1(g)	Validate Weapons Solution Display	2
7 2.2.2(g)	7.2.2.2(g)	Deliver PGM (LGB/MAV/Adv PGM)	5
7 2 2.2(h)	7.2.2.2(h)	Conduct Self-Lasing LGB Delivery	50
7 2 2.2(i)	7.2.2.2(i)	Conduct Buddy-Lasing LGB Delivery	50
7.2.2.2(j)	7.2.2.2(j)	Update Target Designation	40
7.2.2.2(k)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre	15

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7 2.2.2(l)	7.2.2.1(k)	Conduct BDA	5
7.2.2.2(m)	7.2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections	120
7.2.2.2(n)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays	5
7.2.2.2(o)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre	15
7.2.3.1(a)	7.1.1 2(a)	Establish Radar Contact with Other Formation Members	20
7.2.3.1(b)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7 2.3.1(c)	7.1.1.3(c)	Conduct Formation Join-up	60
7 2.3.1(d)	7.1 1.2(f)	Establish Visual Contact with Other Formation Members	10
7 2 3 1(e)	7.1.1.2(g)	Establish AMIRS Contact with Other Formation Members	10
7.2 3.1(f)	7.1 1.2(h)	Establish NVG Contact with Other Formation Members	10
7 2 3.2(a)	7.2.1.1(a)	Allow Aircraft Emmisions for Identification	7
7.2.3.2(b)	7.2.3.2(b)	Egress at Low Altitude	999
7 2 3 2(c)	7.2.3.2(c)	Egress at Medium/High Altitude	999
7.2.3.2(d)	7.2.3.2(d)	Conduct Lame Duck Procedures	999
7.2.3.2(e)	7.2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)	30
7.2.3 2(f)	7.2.1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)	30
7.2.4.1(a)	7.2.4.1(a)	Pass IFREP	15
7 2.4 2(a)	7.2.4.2(a)	Conduct BD Check	90
7.2.4.2(b)	7.2.4.2(b)	Conduct Fence Out Check	15
7 2.5.1(a)	7.2.5.1(a)	Establish Tactical Roles - Tactical Leads and Wingmen	999
7 2 5.1(b)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position	999
7.2 5.1(c)	7.2 5.1(c)	Execute Manoeuvre Turns	30
7 2.5.1(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7 2.5.2(a)	7.2.5.2(a)	Optimize Formation for Tactical Situation	999
7.2.5.2(b)	7.2.5.2(b)	Maintain Visual Mutual Support	999
7 2.5.2(c)	7.2.5.2(c)	Maintain Positional Mutual Support	999
7 2.5.2(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.2 5.2(e)	7.2 5.2(e)	Maintain Visual Mutual Support with NVG	999
7.2 5.2(f)	7 2.5.2(f)	Communicate with Formation Members via Discreet Frequency	5
7.2.5.2(g)	7.2.5.2(g)	Communicate with Formation Members via Data Link	10

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.2.6.1(a)	7.2.6.1(a)	Maintain Ground Track	999
7.2.6.1(b)	7.2.6 1(b)	Adhere to ACO	999
7 2 6.1(c)	7 2.6.1(c)	Adjust G/S to Make Tasking Timings	10
7 2.6.1(d)	7.2 6.1(d)	Monitor and Avoid ACO Restricted Areas	999
7.2 6.2(a)	7.2.6.2(a)	Navigate Using Visual References	10
7.2.6.2(b)	7.2.6.2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs	10
7.2.6.2(c)	7.2.6.2(c)	Perform Navigation Systems Designations/Updates	15
7.2.6.2(d)	7.2.6.2(d)	Employ Watch Map Ground Technique	20
7 2 6.2(e)	7.2.6.2(e)	Arrive at Target at Predetermined TOT	999
7.2.6 2(f)	7.2.6.2(f)	Navigate Using NVG Visual References	20
7.2 6 3(a)	7.2.6.3(a)	Monitor and Avoid Weather	10
7.2 6.3(b)	7.2.6.3(b)	Monitor and Avoid Obstacles	999
7.2 6 3(c)	7 2.6.3(c)	Monitor and Avoid Terrain	999
7.2.6 3(e)	7.2.6.3(e)	Monitor and Avoid Other Aircraft	999
7.2.7.1(a)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters	3
7 2.7.1(b)	7.2.7.1(b)	Monitor and Maintain Radar Contact with Formation Members	4
7.2 7 1(c)	7.2.7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements	4
7.2 7.1(d)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns	5
7.2.7.1(e)	7.2.7.1(e)	Advise on Radar Acquired Unknowns	10
7 2.7.1(f)	7.2 7.1(f)	Radar Sort Multiple Unknown Contacts	30
7.2.7.1(g)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF	15
7.2.7.1(h)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays	5
7.2.7 2(a)	7.2.7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters	2
7.2.7 2(b)	7.2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members	4
7.2 7 2(c)	7.2.7.2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elemer	4
7.2.7.2(d)	7.2.7.2(d)	Monitor and Maintain AMIRS Contact with Unknowns	5
7 2.7.2(e)	7.2.7.2(e)	Advise on AMIRS Acquired Unknowns	10
7.2.7.2(f)	7.2 7.2(f)	Sort Multiple Unknown Contacts with AMIRS	30
7.2.7.2(g)	7.2.7.2(g)	Interrogate Unknown AMIRS Contacts with IFF	15
7.2 7 3(a)	7.2 7.3(a)	Maintain Visual Search Patterns	5

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.2.7.3(b)	7.2 7 3(b)	Monitor and Maintain Visual Contact with Formation Members	2
7.2 7.3(c)	7.2 7 3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element	2
7.2 7.3(d)	7.2 7.3(d)	Monitor and Maintain Visual Contact with Unknowns	5
7.2.7 3(e)	7.2.7 3(e)	Advise on Visually Acquired Unknowns	15
7.2 7.3(f)	7.2.7.3(f)	Maintain NVG Visual Search Patterns	7
7.2.7.3(g)	7.2.7.3(g)	Monitor and Maintain NVG Contact with Formation Members	7
7.2 7.3(h)	7.2.7 3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements	7
7.2.7.3(i)	7 2.7.3(i)	Monitor and Maintain NVG Contact with Unknowns	7
7 3.1 1(a)	7.2.1.1(a)	Reduce Aircraft Emissions (EMCON Procedures)	7
7 3 1.1(b)	7.2.1.1(b)	Ingress at Low Altitude (Sophisticated Environment)	999
7.3.1.1(c)	7.2.1.1(c)	Ingress at Medium/High Altitude (Permissive Environement)	999
7.3.1.1(d)	7.2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)	30
7.3.1.1(e)	7.2.1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)	30
7 3.2.1(a)	7.3.2.1(a)	Copy Target Brief from FAC	90
7.3.2.1(b)	7.3 2 1(b)	Read Back Mandatory Items to FAC	90
7.3.2 1(c)	7 3.2.1(c)	Enter Target Location in Aircraft database	30
7.3 2.1(d)	7.3.2.1(e)	Confirm Target Location and Restrictions on MAP/HSD	60
7 3.2.1(e)	7.3.2.1(e)	Communicate with FAC via DATA LINK 16	60
7.3 2.2(a)	7.3.2.2(a)	Receive Target Description Brief from FAC	120
7.3.2.2(b)	7.3.2.2(b)	Find Target Using Sensors	120
7 3 2.2(c)	7.3.2.2(c)	Find Target Visually	60
7 3 2.2(d)	7.3.2.2(d)	Communicate Target Acquired	10
7.3.2.2(e)	7.3.2.2(e)	Describe Target Area and Target to FAC	60
7.3.2.2(f)	7.3.2.2(f)	Conduct Target Run In	120
7.3 2.2(g)	7.3.2.1(e)	Communicate with FAC via DATA LINK 16	60
7.3.2.2(h)	7.3.2.2(h)	Find Target with NVG	60
7 3 3.1(a)	7.2.2.1(a)	Conduct A/G Check	15
7.3.3.1(b)	7.2.2.1(b)	Identify Initial Point Visually	5
7.3.3.1(c)	7.2.2.1(c)	Designate/Add Offset at Initial Point	25
7.3.3 1(d)	7 2.2.1(d)	Manoeuvre to Weapons Delivery Parameters	30

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.3.3 1(e)	7.2.2 1(b)	Identify Target/DMPI Visually	5
7 3 3 1(f)	7.2 2 1(f)	Conduct Element Split Attacks	70
7 3.3.1(g)	7 2 2.1(g)	Validate Weapons Solution Display	2
7.3.3.1(h)	7.2.2.1(h)	Deliver GP Weapons(Bombs/Rx/Cluster/Gx)	3
7 3.3 1(ı)	7.2.2.1(ı)	Conduct Safe Escape Manoeuvre	15
7.3.3.1(j)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre	15
7.3 3 1(k)	7.2.2.1(k)	Conduct BDA	5
7 3 3 1(l)	7.2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections	120
7.3.3.1(m)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays	5
7.3.3 1(n)	7.2.2.1(n)	Search for Initial Point	10
7.3.3.1(o)	7.2.2.1(o)	Search for Target	4
7 3 3.1(p)	7.2 2.1(p)	Identify Initial Point with NVG	5
7.3.3.1(q)	7.2.2.1(p)	Identify Target/DMPI with NVG	5
7 3.3 2(a)	7.2.2.1(a)	Conduct A/G Check	15
7 3 3 2(b)	7.2.2.2(b)	Designate Target Position	25
7 3.3.2(c)	7.2.2.2(c)	Identify Target Area with Aircraft Sensors	10
7.3 3.2(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters	30
7.3 3.2(e)	7.2.2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16	10
7 3 3.2(f)	7.2.2.1(g)	Validate Weapons Solution Display	2
7.3 3 2(g)	7.2.2.2(g)	Deliver PGM (LGB/MAV/Adv PGM)	5
7.3 3 2(h)	7.2.2.2(h)	Conduct Self-Lasing LGB Delivery	50
7.3 3.2(i)	7.2.2 2(i)	Conduct Buddy-Lasing LGB Delivery	50
7.3 3 2(j)	7.2 2.2(j)	Update Target Designation	40
7.3.3 2(k)	7.2.2.1(ı)	Conduct Safe Escape Manoeuvre	15
7.3 3.2(l)	7.2.2.1(k)	Conduct BDA	5
7 3 3.2(m)	7.2 2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections	120
7.3.3.2(n)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays	5
7 3 3 2(o)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre	15
7 3.4.1(a)	7.1 1.2(a)	Establish Radar Contact with Other Formation Members	20
7.3.4.1(b)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.3.4.1(c)	7.1.1.3(c)	Conduct Formation Join-up	60
7 3.4.1(d)	7.1.1.2(f)	Establish Visual Contact with Other Formation Members	10
7.3.4.1(e)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members	10
7.3.4 2(a)	7.2.1.1(a)	Allow Aircraft Emmisions for Identification	7
7.3 4 2(b)	7.2.3.2(b)	Egress at Low Altitude	999
7.3 4 2(c)	7.2.3 2(c)	Egress at Medium/High Altitude	999
7 3 4.2(d)	7.2.3.2(d)	Conduct Lame Duck Procedures	999
7 3 4.2(e)	7.2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)	30
7.3.4.2(f)	7.2.1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)	30
7 3.5.1(a)	7.2.4.1(a)	Pass IFREP	15
7.3.5.2(a)	7.2 4.2(a)	Conduct BD Check	90
7.3.5.2(b)	7.2.4.2(b)	Conduct Fence Out Check	15
7.3.6.1(a)	7.2 5.1(a)	Establish Tactical Roles - Tactical Leads and Wingmen	999
7.3.6.1(b)	7.2 5 1(b)	Maintain Aircraft Control and Flight Position	999
7.3.6.1(c)	7.2.5.1(c)	Execute Manoeuvre Turns	30
7 3.6 1(d)	7 1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7 3.6 2(a)	7.2.5.2(a)	Optimize Formation for Tactical Situation	999
7.3.6.2(b)	7.2.5.2(b)	Maintain Visual Mutual Support	999
7.3.6.2(c)	7.2.5.2(c)	Maintain Positional Mutual Support	999
7.3.6 2(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.3.6.2(e)	7.2.5.2(e)	Maintain Visual Mutual Support with NVG	999
7 3.6.2(f)	7.2.5.2(f)	Communicate with Formation Members via Discreet frequency	5
7.3 6 2(g)	7.2.5.2(g)	Communicate with Formation Members via Data Link	10
7.3.7.1(a)	7.2 6.1(a)	Maintain Ground Track	999
7.3.7.1(b)	7.2.6.1(b)	Adhere to ACO	999
7 3 7 1(c)	7.2.6.1(c)	Adjust G/S to Make Tasking Timings	10
7 3.7.1(d)	7.2.6.1(d)	Monitor and Avoid ACO Restricted Areas	999
7.3.7 2(a)	7.2.6.2(a)	Navigate Using Visual References	10
7.3.7.2(b)	7.2.6.2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs	10
7.3.7.2(c)	7.2.6 2(c)	Perform Navigation Systems Designations/Updates	15

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.3 7.2(d)	7.2.6.2(d)	Employ Watch Map Ground Technique	20
7 3 7.2(e)	7.2.6.2(e)	Arrive at Target at Predetermined TOT	999
7.3.7 2(f)	7 2.6.2(f)	Navigate Using NVG Visual References	20
7.3.7.3(a)	7.2 6.3(a)	Monitor and Avoid Weather	10
7.3 7.3(b)	7.2.6.3(b)	Monitor and Avoid Obstacles	999
7.3.7.3(c)	7.2.6.3(c)	Monitor and Avoid Terrain	999
7.3.7 3(d)	7.2.6.3(e)	Monitor and Avoid Other Aircraft	999
7.3.8.1(a)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters	3
7 3 8 1(b)	7.2 7.1(b)	Monitor and Maintain Radar Contact with Formation Members	4
7.3.8.1(c)	7.2.7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements	4
7.3.8.1(d)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns	5
7.3.8.1(e)	7.2.7.1(e)	Advise on Radar Acquired Unknowns	10
7.3.8.1(f)	7.2.7.1(f)	Radar Sort Multiple Unknown Contacts	30
7.3 8 1(g)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays	5
7.3 8 1(h)	7.2.7 1(g)	Interrogate Unknown Radar Contacts with IFF	15
7.3.8.2(a)	7.2.7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters	2
7.3.8.2(b)	7.2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members	4
7 3 8 2(c)	7.2.7 2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elemer	4
7.3.8.2(d)	7.2.7.2(g)	Interrogate Unknown AMIRS Contacts with IFF	15
7 3.8.2(e)	7 2 7.2(d)	Monitor and Maintain AMIRS Contact with Unknowns	5
7 3 8.2(f)	7 2.7.2(e)	Advise on AMIRS Acquired Unknowns	10
7.3 8.2(g)	7.2.7.2(f)	Sort Multiple Unknown Contacts with AMIRS	30
7.3.8.3(a)	7.2.7.3(a)	Maintain Visual Search Patterns	5
7.3.8.3(b)	7.2.7.3(b)	Monitor and Maintain Visual Contact with Formation Members	2
7.3 8.3(c)	7.2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element	2
7.3.8.3(d)	7.2.7.3(d)	Monitor and Maintain Visual Contact with Unknowns	5
7 3 8 3(e)	7.2 7.3(e)	Advise on Visually Acquired Unknowns	15
7 3 8 3(f)	7.2.7.3(f)	Maintain NVG Visual Search Patterns	7
7.3.8.3(g)	7.2.7 3(g)	Monitor and Maintain NVG Contact with Formation Members	7
7.3.8.3(h)	7.2.7 3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements	7

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.3.8.3(1)	7.2.7.3(1)	Monitor and Maintain NVG Contact with Unknowns	7
7.4.1.1(a)	7.2.1.1(a)	Reduce Aircraft Emissions (EMCON Procedures)	7
7.4.1 1(b)	7.2.1.1(b)	Ingress at Low Altitude (Sophisticated Environment)	999
7.4 1 1(c)	7.2.1.1(c)	Ingress at Medium/High Altitude (Permissive Environement)	999
7.4.1 1(d)	7 2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)	30
7.4.1.1(e)	7 2 1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)	30
7 4.2 1(a)	7.4.2.1(a)	Conduct Visual Lookout	5
7 4.2 1(b)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information	10
7.4.2.1(c)	7 4.2.1(c)	Acquire Enemy Targets on LINK 16/MIDS Displays	15
7.4.2.1(d)	7.4 2.1(d)	Find Target with Radar Search Sort and Target Contract	30
7 4.2.1(e)	7.4.2 1(e)	Utilize Lateral Mission Element Tactical Information	30
7.4.2.1(f)	7 4 2 1(f)	Find Target with AMIRS Search Sort and Target Contract	30
7 4 2.1(g)	7.4.2.1(g)	Conduct Visual Lookout with NVG	7
7.4.2.2(a)	7.4 2 2(a)	Report Target via LINK 16/MIDS Secure Communications	20
7.4.2.2(b)	7.4.2 2(b)	Report Target via Have Quick II Secure Communications	20
7.4.2.2(c)	7.4.2.2(c)	Utilize C2 Directive and Descriptive Commentary	10
7.4 2.2(d)	7.2.2.1(b)	Identify Target/DMPI Visually	5
7.4.2 2(e)	7.2.2.2(c)	Identify Target Area with Aircraft Sensors	10
7.4.2.2(f)	7.2.2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16	10
7.4.2.2(g)	7.2.2 1(p)	Identify Initial Point with NVG	5
7.4.3.1(a)	7.2.2.1(b)	Identify Initial Point Visually	5
7.4.3.1(b)	7.2.2.1(c)	Designate/Add Offset at Initial Point	25
7.4.3.1(c)	7.2.2.1(a)	Conduct A/G Check	15
7.4.3 1(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters	30
7.4.3.1(e)	7 2.2.1(b)	Identify Target/DMPI Visually	5
7 4.3.1(f)	7 2.2.1(f)	Conduct Element Split Attacks	70
7.4.3.1(g)	7.2.2.1(g)	Validate Weapons Solution Display	2
7 4.3 1(h)	7.2.2.1(h)	Deliver GP Weapons(Bombs/Rx/Cluster/Gx)	3
7.4.3.1(i)	7.2 2.1(i)	Conduct Safe Escape Manoeuvre	15
7 4.3.1(j)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre	15

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.4.3.1(k)	7.2.2.1(k)	Conduct BDA	5
7.4.3 1(l)	7.2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections	120
7.4.3.1(m)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays	5
7.4.3.1(n)	7 2.2.1(n)	Search for Initial Point	10
7.4.3.1(o)	7 2 2 1(o)	Search for Target	4
7.4.3.1(p)	7 2 2.1(p)	Identify Initial Point with NVG	5
7 4.3.1(q)	7.2.2.1(p)	Identify Target/DMPI with NVG	5
7.4.3.2(a)	7.2.2.1(a)	Conduct A/G Check	15
7 4.3.2(b)	7.2.2.2(b)	Designate Target Position	25
7.4.3.2(c)	7.2.2.2(c)	Identify Target Area with Aircraft Sensors	10
7.4.3.2(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters	30
7.4.3.2(e)	7.2.2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16	10
7 4 3.2(f)	7.2.2.1(g)	Validate Weapons Solution Display	2
7.4.3.2(g)	7.2.2.2(g)	Deliver PGM (LGB/MAV/Adv PGM)	5
7.4.3.2(h)	7.2.2.2(h)	Conduct Self-Lasing LGB Delivery	50
7.4.3.2(i)	7.2.2.2(i)	Conduct Buddy-Lasing LGB Delivery	50
7.4.3.2(j)	7.2.2.2(j)	Update Target Designation	40
7.4.3.2(k)	7.2.2.2(i)	Conduct Buddy-Lasing LGB Delivery	50
7.4.3.2(l)	7.2.2.1(k)	Conduct BDA	5
7.4 3.2(m)	7.2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections	120
7.4 3.2(n)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays	5
7.4 3 2(o)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre	15
7.4.3.2(p)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre	15
7.4.4.1(a)	7.1.1.2(a)	Establish Radar Contact with Other Formation Members	20
7.4.4.1(b)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.4.4.1(c)	7.1.1 3(c)	Conduct Formation Join-up	60
7.4 4 1(d)	7.1.1.2(f)	Establish Visual Contact with Other Formation Members	10
7.4 4 1(e)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members	10
7.4 4 2(a)	7.2.1.1(a)	Allow Aircraft Emmisions for Identification	7
7.4.4.2(b)	7.2.3 2(b)	Egress at Low Altitude	999

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7 4 4.2(c)	7.2.3.2(c)	Egress at Medium/High Altitude	999
7.4 4.2(d)	7.2.3.2(d)	Conduct Lame Duck Procedures	999
7.4.4.2(e)	7.2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)	30
7.4.4.2(f)	7 2.1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)	30
7.4.5.1(a)	7.2.4.1(a)	Pass IFREP	15
7.4.5 2(a)	7.2.4.2(a)	Conduct BD Check	90
7.4.5.2(b)	7.2.4.2(b)	Conduct Fence Out Check	15
7.4 6 1(a)	7.2.5 1(a)	Establish Tactical Roles - Tactical Leads and Wingmen	999
7 4 6 1(b)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position	999
7.4 6 1(c)	7.2.5.1(c)	Execute Manoeuvre Turns	30
7.4.6.1(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.4.6.2(a)	7.2.5.2(a)	Optimize Formation for Tactical Situation	999
7.4.6.2(b)	7.2.5.2(b)	Maintain Visual Mutual Support	999
7.4.6.2(c)	7.2.5.2(c)	Maintain Positional Mutual Support	999
7 4 6 2(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.4.6 2(e)	7.2.5.2(e)	Maintain Visual Mutual Support with NVG	999
7.4.6.2(f)	7.2.5.2(f)	Communicate with Formation Members via Discreet frequency	5
7.4 6.2(g)	7.2.5.2(g)	Communicate with Formation Members via Data Link	10
7.4 7 1(a)	7 2 6.1(a)	Maintain Ground Track	999
7.4 7 1(b)	7 2.6.1(b)	Adhere to ACO	999
7.4 7.1(c)	7.2.6.1(c)	Adjust G/S to Make Tasking Timings	10
7 4.7 1(d)	7.2 6 1(d)	Monitor and Avoid ACO Restricted Areas	999
7.4.7.2(a)	7.2.6.2(a)	Navigate Using Visual References	10
7.4.7.2(b)	7.2.6.2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs	10
7.4.7.2(c)	7.2.6.2(c)	Perform Navigation Systems Designations/Updates	15
7.4 7.2(d)	7.2.6.2(d)	Employ Watch Map Ground Technique	20
7.4 7.2(e)	7.2.6 2(e)	Arrive at Target at Predetermined TOT	999
7.4.7.2(f)	7.2.6.2(f)	Navigate Using NVG Visual References	20
7.4 7 3(a)	7.2.6.3(a)	Monitor and Avoid Weather	10
7 4 7 3(b)	7.2.6.3(b)	Monitor and Avoid Obstacles	999

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.4.7.3(c)	7.2 6.3(c)	Monitor and Avoid Terrain	999
7.4.7.3(d)	7.2.6.3(e)	Monitor and Avoid Other Aircraft	999
7 4.8.1(a)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters	3
7.4.8.1(b)	7.2.7.1(b)	Monitor and Maintain Radar Contact with Formation Members	4
7.4.8.1(c)	7 2.7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements	4
7.4.8.1(d)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns	5
7.4 8 1(e)	7 2.7.1(e)	Advise on Radar Acquired Unknowns	10
7.4.8.1(f)	7.2.7.1(f)	Radar Sort Multiple Unknown Contacts	30
7.4.8.1(g)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays	5
7 4.8.1(h)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF	15
7 4.8.2(a)	7.2.7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters	2
7.4.8.2(b)	7.2.7 2(b)	Monitor and Maintain AMIRS Contact with Formation Members	4
7.4.8.2(c)	7.2.7.2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elemer	4
7 4.8.2(d)	7.2.7.2(g)	Interrogate Unknown AMIRS Contacts with IFF	15
7.4.8 2(e)	7.2.7 2(d)	Monitor and Maintain AMIRS Contact with Unknowns	5
7.4.8 2(f)	7.2.7.2(e)	Advise on AMIRS Acquired Unknowns	10
7.4.8.2(g)	7.2.7.2(f)	Sort Multiple Unknown Contacts with AMIRS	30
7 4.8.3(a)	7.2.7.3(a)	Maintain Visual Search Patterns	5
7.4.8.3(b)	7.2.7.3(b)	Monitor and Maintain Visual Contact with Formation Members	2
7.4.8.3(c)	7.2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element	2
7.4.8.3(d)	7.2.7.3(d)	Monitor and Maintain Visual Contact with Unknowns	5
7.4.8.3(e)	7.2.7 3(e)	Advise on Visually Acquired Unknowns	15
7.4.8.3(f)	7 2.7 3(f)	Maintain NVG Visual Search Patterns	7
7.4.8.3(g)	7.2 7 3(g)	Monitor and Maintain NVG Contact with Formation Members	7
7.4.8.3(h)	7.2.7.3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements	7
7.4.8.3(i)	7.2.7.3(i)	Monitor and Maintain NVG Contact with Unknowns	7
7 5 1.1(a)	7.2.1.1(a)	Reduce Aircraft Emissions (EMCON Procedures)	7
7.5.1.1(b)	7.2.1 1(b)	Ingress at Low Altitude (Sophisticated Environment)	999
7.5 1 1(c)	7.2.1.1(c)	Ingress at Medium/High Altitude (Permissive Environment)	999
7 5.1.1(d)	7.2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)	30

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.5 1 1(e)	7 2.1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)	30
7.5.2.1(a)	7.2.5 2(a)	Optimize Formation for Tactical Situation	999
7.5.2.1(b)	7.5.2.1(b)	Conduct CAP	999
7 5 2.2(a)	7.5.2.2(a)	Employ Radar Search Sort and Target Contract	60
7 5.2.2(b)	7 4.2.1(a)	Conduct Visual Lookout	5
7.5 2.2(c)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information	10
7.5 2 2(d)	7.5.2 2(d)	Initiate and Monitor EID of Unknowns	10
7.5.2 2(e)	7.5.2.2(e)	Advise on Approaching Threats	7
7.5 2.2(f)	7.5.2.2(f)	Advise on Visually Acquired Threats	5
7.5.2.2(g)	7.5.2.2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays	30
7.5.2.2(h)	7.5.2.2(h)	VID Unknowns	5
7.5.2.2(i)	7.4.2.2(a)	Employ LINK 16/MIDS Secure Communications	20
7.5 2.2(j)	7.4.2.2(c)	Utilize C2 Directive and Descriptive Commentary	10
7.5.2.2(k)	7.4.2.1(e)	Utilize Lateral Mission Element Tactical Information	30
7.5.2.2(l)	7.5.2.2(l)	Employ AMIRS Search Sort and Target Contract	60
7.5.2.2(m)	7 2.7.1(g)	Interrogate Unknown Radar Contacts with IFF	15
7 5 2 2(n)	7.4.2 2(b)	Employ Have Quick II Secure Communications	20
7.5.2.2(o)	7.4.2.1(g)	Conduct Visual Lookout with NVG	7
7.5.2.2(p)	7.5.2.2(p)	VID Unknowns with NVG	7
7.5.2.3(a)	7.5.2.3(a)	Employ Tactical Deception	999
7 5.2.3(b)	7.5.2.3(b)	Dispense Chaff	3
7.5.2.3(c)	7.5.2.3(c)	Employ Jammers	15
7 5.2.3(d)	7.5.2.3(d)	Employ BVR Deception Tactics	300
7 5.2 4(a)	7.5.2.4(a)	Manoeuvre/Expose the Tactical Formation	30
7.5.2.4(b)	7.5.2.4(b)	Illuminate Enemy Air RWR	3
7.5.2 4(c)	7.5 2.4(c)	Enhance Enemy Air Radar Acquisition	20
7 5.2 4(d)	7.5.2 4(d)	Draw Enemy Air Away	300
7.5.2 4(e)	7 5.2.4(e)	Negate Enemy Air Weapons Employment	20
7.5.2.5(a)	7.5.2.5(a)	Deny Enemy Air Weapons Solution	999
7.5.2.5(b)	7.5.2.5(b)	Negate Enemy Air Weapons Employment	30

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.5 2 5(c)	7.5.2.5(c)	Employ Air-to-Air RMD	120
7 5 2.5(d)	7.5.2 5(d)	Employ Air-to-Air IRMD	60
7 5 2 5(e)	7.5.2.5(e)	Employ AAGD	45
7.5.2.5(f)	7.5.2.5(f)	Egress Engagement Safely	20
7 5.2.5(g)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information	10
7 5.2 5(h)	7.5 2.2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays	30
7 5.2.6(a)	7.5.2.6(a)	Manoeuvre Aircraft to Intercept Enemy	300
7.5.2.6(b)	7.5.2.5(b)	Negate Enemy Air Weapons Employment	30
7.5 2.6(c)	7.5 2.5(a)	Deny Enemy Air Weapons Solution	999
7.5.2.7(a)	7.5.2.7(a)	Manoeuvre to a Weapons Engagement Zone	60
7 5 2 7(b)	7.2.2.1(g)	Validate Weapons Solution Display	2
7 5 2.7(c)	7.5.2.7(c)	Employ Weapons	10
7.5.2.7(d)	7.5 2 7(d)	Maintain Post Attack Offensive	60
7.5 2 7(e)	7.5.2.5(f)	Egress Engagement Safely	20
7.5 2 7(f)	7.5.2.7(f)	Assess Post Merge ACM Options	30
7.5 2.7(g)	7.5 2 7(g)	Monitor Weapon Fly Out	50
7.5.3.1(a)	7.4.2.1(a)	Conduct Visual Lookout	5
7.5 3 1(b)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information	10
7.5.3.1(c)	7 4.2.1(c)	Acquire Enemy Targets on LINK 16/MIDS Displays	15
7.5.3.1(d)	7.4.2.1(d)	Find Target with Radar Search Sort and Target Contract	30
7 5 3 1(e)	7.4.2.1(e)	Utilize Lateral Mission Element Tactical Information	30
7.5 3.1(f)	7.4.2.1(f)	Find Target with AMIRS Search Sort and Target Contract	30
7.5.3.2(a)	7.4.2.2(a)	Report Target via LINK 16/MIDS Secure Communications	20
7.5 3 2(b)	7.4.2.2(b)	Report Target via Have Quick II Secure Communications	20
7 5 3 2(c)	7.4.2.2(c)	Utilize C2 Directive and Descriptive Commentary	10
7.5.3.2(d)	7.2.2.1(b)	Identify Target/DMPI Visually	5
7.5 3 2(e)	7.2.2.2(c)	Identify Target Area with Aircraft Sensors	10
7 5.3 2(f)	7.2 2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16	10
7 5 3.2(g)	7 2.2.1(p)	Identify Target/DMPI with NVG	5
7 5.4.1(a)	7 2 2.1(a)	Conduct A/G Check	15

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7 5 4 1(b)	7.2.2.1(b)	Identify Initial Point Visually	5
7.5.4.1(c)	7 2.2.1(c)	Designate/Add Offset at Initial Point	25
7.5.4.1(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters	30
7.5.4.1(e)	7.2.2.1(b)	Identify Target/DMPI Visually	5
7.5.4.1(f)	7.2.2.1(f)	Conduct Element Split Attacks	70
7 5 4.1(g)	7.2 2.1(g)	Validate Weapons Solution Display	2
7.5.4.1(h)	7.2.2.1(h)	Deliver GP Weapons(Bombs/Rx/Cluster/Gx)	3
7.5.4.1(i)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre	15
7.5.4.1(j)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre	15
7.5 4.1(k)	7.2.2.1(k)	Conduct BDA	5
7.5 4 1(l)	7.2.2 1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections	120
7.5.4.1(m)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays	5
7 5 4.1(n)	7.2.2.1(n)	Search for Initial Point	10
7.5.4.1(o)	7.2.2.1(o)	Search for Target	4
7.5.4.1(p)	7.2.2.1(p)	Identify Initial Point with NVG	5
7.5.4.1(q)	7.2.2.1(p)	Identify Target/DMPI with NVG	5
7 5.4.2(a)	7.2 2.1(a)	Conduct A/G Check	15
7.5.4.2(b)	7.2.2.2(b)	Designate Target Position	25
7 5.4 2(c)	7 2.2.2(c)	Identify Target Area with Aircraft Sensors	10
7.5.4.2(d)	7.2.2.1(d)	Manoeuvre to Weapons Delivery Parameters	30
7.5.4.2(e)	7.2.2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16	10
7.5.4.2(f)	7.2 2.1(g)	Validate Weapons Solution Display	2
7.5.4.2(g)	7.2.2 2(g)	Deliver PGM (LGB/MAV/Adv PGM)	5
7 5 4.2(h)	7.2.2.2(h)	Conduct Self-Lasing LGB Delivery	50
7.5.4.2(i)	7.2 2.2(i)	Conduct Buddy-Lasing LGB Delivery	50
7 5.4.2(j)	7.2.2.2(j)	Update Target Designation	40
7 5.4.2(k)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre	15
7.5.4.2(l)	7.2.2.1(k)	Conduct BDA	5
7.5.4.2(m)	7.2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections	120
7.5.4 2(n)	7 2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays	5

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.5 4 2(o)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre	15
7 5.5.1(a)	7.1 1.2(a)	Establish Radar Contact with Other Formation Members	20
7.5.5.1(b)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.5.5.1(c)	7 1.1.3(c)	Conduct Formation Join-up	60
7.5 5 1(d)	7.1.1.2(f)	Establish Visual Contact with Other Formation Members	10
7.5.5.1(e)	7.1.1.2(h)	Establish NVG Contact with Other Formation Members	10
7.5 5 2(a)	7.2.1.1(a)	Allow Aircraft Emmisions for Identification	7
7.5.5.2(b)	7.2.3.2(b)	Egress at Low Altitude	999
7.5.5.2(c)	7.2.3.2(c)	Egress at Medium/High Altitude	999
7 5 5 2(d)	7.2.3.2(d)	Conduct Lame Duck Procedures	999
7.5.5.2(e)	7.2.1.1(d)	Descend to Low Altitude (Sophisticated Environment)	30
7.5.5.2(f)	7.2.1.1(e)	Adjust to Medium/High Altitude (Permissive Environment)	30
7.5.6.1(a)	7.2.4.1(a)	Pass IFREP	15
7.5.6.2(a)	7.2.4.2(a)	Conduct BD Check	90
7.5.6.2(b)	7.2.4.2(b)	Conduct Fence Out Check	15
7.5.7.1(a)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.5.7.1(b)	7.2.5.1(a)	Establish Tactical Roles - Tactical Leads and Wingmen	999
7.5.7.1(c)	7.2.5.1(c)	Execute Manoeuvre Turns	30
7.5 7 1(d)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position	999
7.5 7 1(e)	7 2.5.2(f)	Communicate with Formation Members via Discreet frequency	5
7.5.7.1(f)	7.2.5.2(g)	Communicate with Formation Members via Data Link	10
7.5.7.2(a)	7.2.5.2(a)	Optimize Formation for Tactical Situation	999
7.5.7.2(b)	7.2 5.2(b)	Maintain Visual Mutual Support	999
7 5 7 2(c)	7.2 5.2(c)	Maintain Positional Mutual Support	999
7 5.7.2(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.5.7 2(e)	7.2.5.2(e)	Maintain Visual Mutual Support with NVG	999
7 5.8.1(a)	7.2.6.1(a)	Maintain Ground Track	999
7.5 8 1(b)	7.2.6.1(b)	Adhere to ACO	999
7 5 8 1(c)	7.2.6.1(c)	Adjust G/S to Make Tasking Timings	10
7.5.8.1(d)	7.2.6.1(d)	Monitor and Avoid ACO Restricted Areas	999

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.5 8.2(a)	7.2.6.2(a)	Navigate Using Visual References	10
7 5 8.2(b)	7.2.6.2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs	10
7 5.8.2(c)	7.2.6.2(c)	Perform Navigation Systems Designations/Updates	15
7.5.8.2(d)	7.2.6.2(d)	Employ Watch Map Ground Technique	20
7.5 8 2(e)	7.2.6.2(e)	Arrive at Target at Predetermined TOT	999
7.5 8 2(f)	7.2.6.2(f)	Navigate Using NVG Visual References	20
7.5.8.3(a)	7.2.6.3(a)	Monitor and Avoid Weather	10
7.5.8.3(b)	7.2.6.3(b)	Monitor and Avoid Obstacles	999
7.5.8.3(c)	7.2.6.3(c)	Monitor and Avoid Terrain	999
7 5.8.3(d)	7.2 6 3(e)	Monitor and Avoid Other Aircraft	999
7.5.9.1(a)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns	5
7.5.9.1(b)	7 2.7.1(e)	Advise on Radar Acquired Unknowns	10
7.5.9.1(c)	7.2.7.1(f)	Radar Sort Multiple Unknown Contacts	30
7.5.9 1(d)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters	3
7.5.9.1(e)	7.2.7.1(b)	Monitor and Maintain Radar Contact with Formation Members	4
7.5.9 1(f)	7.2.7 1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements	4
7.5.9.1(g)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays	5
7.5.9.1(h)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF	15
7 5 9.2(a)	7.2.7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters	2
7.5.9.2(b)	7.2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members	4
7.5.9.2(c)	7 2.7.2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elemer	4
7.5.9 2(d)	7 2.7.2(g)	Interrogate Unknown AMIRS Contacts with IFF	15
7 5.9.2(e)	7.2.7.2(d)	Monitor and Maintain AMIRS Contact with Unknowns	5
7.5.9.2(f)	7 2.7.2(e)	Advise on AMIRS Acquired Unknowns	10
7.5 9.2(g)	7.2.7.2(f)	Sort Multiple Unknown Contacts with AMIRS	30
7 5.9.3(a)	7.2.7.3(a)	Maintain Visual Search Patterns	5
7.5.9.3(b)	7.2.7.3(b)	Monitor and Maintain Visual Contact with Formation Members	2
7 5 9.3(c)	7.2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element	2
7.5.9.3(d)	7.2 7.3(d)	Monitor and Maintain Visual Contact with Unknowns	5
7.5.9.3(e)	7.2.7.3(e)	Advise on Visually Acquired Unknowns	15

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.5.9.3(f)	7.2.7.3(f)	Maintain NVG Visual Search Patterns	7
7 5.9 3(g)	7.2.7.3(g)	Monitor and Maintain NVG Contact with Formation Members	7
7.5.9.3(h)	7 2.7.3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements	7
7.5.9 3(i)	7.2.7.3(i)	Monitor and Maintain NVG Contact with Unknowns	7
7.6 1 1(a)	7.2.5.1(a)	Establish Tactical Roles - Tactical Leads and Wingmen	999
7.6.1.1(b)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position	999
7.6.1.1(c)	7.2.5.1(c)	Execute Manoeuvre Turns	30
7.6.1.2(a)	7.2.5.2(a)	Optimize Formation for Tactical Situation	999
7 6 1.2(b)	7.2 5.2(b)	Maintain Visual Mutual Support	999
7 6 1.2(c)	7 2.5.2(c)	Maintain Positional Mutual Support	999
7.6.1.2(d)	7.2.5.2(e)	Maintain Visual Mutual Support with NVG	999
7 6 1.3(a)	7.2.6.1(a)	Maintain Ground Track	999
7.6.1.3(b)	7.2 6.1(b)	Adhere to ACO	999
7.6.1.3(c)	7.2.6.1(c)	Adjust G/S to Make Tasking Timings	10
7.6 1 3(d)	7.2.6 1(d)	Monitor and Avoid ACO Restricted Areas	999
7.6 1 4(a)	7.2.6 2(a)	Navigate Using Visual References	10
7.6 1.4(b)	7.2.6.2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs	10
7.6.1.4(c)	7.2.6.2(c)	Perform Navigation Systems Designations/Updates	15
7.6.1.4(d)	7.2.6.2(d)	Employ Watch Map Ground Technique	20
7 6.1.4(e)	7.2 6.2(e)	Arrive at Target at Predetermined TOT	999
7.6.1.4(f)	7.2.6.2(f)	Navigate Using NVG Visual References	20
7 6.1.5(a)	7.2.6.3(a)	Monitor and Avoid Weather	10
7.6.1.5(b)	7.2.6.3(b)	Monitor and Avoid Obstacles	999
7.6.1.5(c)	7.2.6.3(c)	Monitor and Avoid Terrain	999
7.6.1.6(a)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters	3
7.6.1.6(b)	7.2 7.1(b)	Monitor and Maintain Radar Contact with Formation Members	4
7.6.1.6(c)	7.2.7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements	4
7.6.1 6(d)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns	5
7.6.1.6(e)	7.2.7.1(e)	Advise on Radar Acquired Unknowns	10
7 6.1.6(f)	7.2.7.1(f)	Radar Sort Multiple Unknown Contacts	30

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.6.1.6(g)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays	5
7.6.1.6(h)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF	15
7 6.1.7(a)	7.2.7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters	2
7.6.1.7(b)	7 2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members	4
7.6.1.8(a)	7.2.7.3(a)	Maintain Visual Search Patterns	5
7.6 1 8(b)	7.2.7.3(b)	Monitor and Maintain Visual Contact with Formation Members	2
7 6 1.8(c)	7.2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element	2
7.6.1.8(d)	7.2 7.3(d)	Monitor and Maintain Visual Contact with Unknowns	5
7 6.1.8(e)	7.2 7.3(e)	Advise on Visually Acquired Unknowns	15
7.6 1.8(f)	7.2.7.3(f)	Maintain NVG Visual Search Patterns	7
7.6 1.8(g)	7.2.7.3(g)	Monitor and Maintain NVG Contact with Formation Members	7
7.6.1.8(h)	7.2.7.3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements	7
7.6.1.8(i)	7.2.7.3(i)	Monitor and Maintain NVG Contact with Unknowns	7
7.6.2 1(a)	7.6.2.1(a)	Generate Positive Closure	2
7.6.2.1(b)	7.6.2.1(b)	Maintain Positive Closure	5
7.6.2.1(c)	7.6.2.1(c)	Monitor and Obey AAR Lights	999
7.6.2.2(a)	7.6.2.2(a)	Position Pitch Ladders	5
7.6.2 2(b)	7.6.2.2(b)	Align Probe	5
7.6 2.2(c)	7.6.2.1(c)	Monitor and Obey AAR Lights	999
7 6.2.3(a)	7.6.2.3(a)	Pick Approach Reference	2
7.6.2.3(b)	7.6.2.3(b)	Maintain Attitude References	10
7.6.2.3(c)	7 6.2.3(c)	Make Contact	2
7.6.2.3(d)	7.6.2.1(c)	Monitor and Obey AAR Lights	999
7.6.3.1(a)	7.6.3.1(a)	Generate Maximum Fuel Transfer	5
7.6.3.1(b)	7.6.2 1(c)	Monitor and Obey AAR Lights	999
7.6.3.2(a)	7.6.3.1(a)	Maintain Hose in Trail Position	5
7 6.3.2(b)	7.6.2.3(c)	Maintain Probe Contact	2
7 6 3.2(c)	7.6.2 1(c)	Monitor and Obey AAR Lights	999
7 6.3.3(a)	7.6.3.3(a)	Generate Negative Closure	3
7.6.3.3(b)	7.6.2 3(b)	Maintain Attitude References	10

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7 6 3.3(c)	7.6.3 3(c)	Move to Astern Position	5
7.6 3.3(d)	7.6.2.1(c)	Monitor and Obey AAR Lights	999
7 6 3 3(e)	7.6.3.3(e)	Move to Outboard / Echelon Position	10
7 6 4.1(a)	7.6.4.1(a)	Establish Departure Echelon Position	5
7.6.4.1(b)	7.6.4 1(b)	Request Clearance to Depart	5
7 6 4.1(c)	7.6.4.1(c)	Depart	30
7.6.4.2(a)	7.2.5.1(a)	Establish Tactical Roles - Tactical Leads and Wingmen	999
7.6 4 2(b)	7.2.5.1(b)	Maintain Aircraft Control and Flight Position	999
7.6.4 2(c)	7.2.5.1(c)	Execute Manoeuvre Turns	30
7.6.4.2(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.6.4.3(a)	7.2.5.2(a)	Optimize Formation for Tactical Situation	999
7.6.4 3(b)	7.2.5.2(b)	Maintain Visual Mutual Support	999
7.6.4 3(c)	7.2.5.2(c)	Maintain Positional Mutual Support	999
7.6.4 3(d)	7.1.1.3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	5
7.6.4.3(e)	7.2.5.2(e)	Maintain Visual Mutual Support with NVG	999
7.6.4.4(a)	7.2.6.1(a)	Maintain Ground Track	999
7.6.4.4(b)	7.2.6.1(b)	Adhere to ACO	999
7.6.4.4(c)	7.2.6.1(c)	Adjust G/S to Make Tasking Timings	10
7.6 4.4(d)	7.2.6.1(d)	Monitor and Avoid ACO Restricted Areas	999
7.6.4.5(a)	7.2.6.2(a)	Navigate Using Visual References	10
7.6.4.5(b)	7.2.6.2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs	10
7.6.4.5(c)	7 2 6.2(c)	Perform Navigation Systems Designations/Updates	15
7 6.4.5(d)	7.2.6.2(d)	Employ Watch Map Ground Technique	20
7.6.4.5(e)	7.2.6.2(e)	Arrive at Target at Predetermined TOT	999
7.6.4.5(f)	7.2.6.2(f)	Navigate Using NVG Visual References	20
7.6.4.6(a)	7.2.6.3(a)	Monitor and Avoid Weather	10
7.6.4.6(b)	7.2.6.3(b)	Monitor and Avoid Obstacles	999
7 6 4.6(c)	7.2 6 3(c)	Monitor and Avoid Terrain	999
7 6 4.6(d)	7.2.6.3(e)	Monitor and Avoid Other Aircraft	999
7 6.4.7(a)	7.2.7.1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters	3

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.6 4 7(b)	7.2.7.1(b)	Monitor and Maintain Radar Contact with Formation Members	4
7 6.4.7(c)	7.2 7.1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements	4
7.6.4.7(d)	7.2.7.1(d)	Monitor and Maintain Radar Contact with Unknowns	5
7.6 4 7(e)	7.2.7.1(e)	Advise on Radar Acquired Unknowns	10
7.6.4 7(f)	7.2.7.1(f)	Radar Sort Multiple Unknown Contacts	30
7.6.4.7(g)	7.2.7.1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays	5
7.6.4.7(h)	7.2 7.1(g)	Interrogate Unknown Radar Contacts with IFF	15
7.6 4 8(a)	7.2.7.2(a)	Monitor and Maintain Assigned AMIRS Search Parameters	2
7.6.4.8(b)	7.2.7.2(b)	Monitor and Maintain AMIRS Contact with Formation Members	4
7.6.4.8(c)	7.2.7.2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elemer	4
7 6.4.8(d)	7 2.7.2(g)	Interrogate Unknown AMIRS Contacts with IFF	15
7.6.4.8(e)	7.2.7.2(d)	Monitor and Maintain AMIRS Contact with Unknowns	5
7.6.4 8(f)	7.2 7.2(e)	Advise on AMIRS Acquired Unknowns	10
7.6.4.8(g)	7.2.7.2(f)	Sort Multiple Unknown Contacts with AMIRS	30
7 6.4 9(a)	7 2 7.3(a)	Maintain Visual Search Patterns	5
7 6 4.9(b)	7.2 7.3(b)	Monitor and Maintain Visual Contact with Formation Members	2
7.6.4 9(c)	7.2.7.3(c)	Monitor and Maintain Visual Contact with Lateral Mission Element	2
7.6 4.9(d)	7.2.7.3(d)	Monitor and Maintain Visual Contact with Unknowns	5
7.6.4.9(e)	7.2.7.3(e)	Advise on Visually Acquired Unknowns	15
7.6.4.9(f)	7.2.7.3(f)	Maintain NVG Visual Search Patterns	7
7 6 4.9(g)	7.2 7.3(g)	Monitor and Maintain NVG Contact with Formation Members	7
7.6 4 9(h)	7.2.7.3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements	7
7.6.4.9(i)	7.2.7.3(i)	Monitor and Maintain NVG Contact with Unknowns	7
7.7.1.1(a)	7 5 2.2(a)	Employ Radar Search Sort and Target Contract	60
7 7.1.1(b)	7 4 2.1(a)	Conduct Visual Lookout	5
7.7 1.1(c)	7.4 2 1(b)	Respond to displayed RWR Threat Emission Information	10
7 7 1.1(d)	7.5.2 2(d)	EID Unknowns	10
7.7.1.1(e)	7.5.2.2(e)	Advise on Approaching Threats	7
7.7.1.1(f)	7.5.2.2(f)	Advise on Visually Acquired Threats	5
7.7.1.1(g)	7.5.2.2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays	30

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.7 1.1(h)	7.5.2.2(h)	VID Unknowns	5
7.7 1 1(ı)	7.4.2.2(a)	Employ LINK 16/MIDS Secure Communicatıons	20
7.7 1.1(j)	7.4.2 2(c)	Utilize C2 Directıve and Descrıptıve Commentary	10
7 7.1.1(k)	7.4 2.1(e)	Utilıze Lateral Mission Element Tactıcal Information	30
7.7.1 1(l)	7.5.2.2(l)	Employ AMIRS Search Sort and Target Contract	60
7.7 1 1(m)	7.2.7.1(g)	Interrogate Unknown Radar Contacts with IFF	15
7.7.1.1(n)	7.4.2.2(b)	Employ Have Quıck II Secure Communications	20
7.7 1 1(o)	7.4.2.1(g)	Conduct Vısual Lookout with NVG	7
7.7.1.1(p)	7.5.2.2(p)	VID Unknowns with NVG	7
7.7.2.1(a)	7.7.2.1(a)	Manoeuvre the Tactıcal Formatıon	999
7 7.2.1(b)	7.7.2.1(b)	Avoıd Illuminating of the Enemy Air RWR	5
7.7.2.1(c)	7.7.2.1(c)	Configure the Tactıcal Formatıon	45
7.7.2.1(d)	7.7.2.1(d)	Establish Dıvergıng Paths	10
7.7 2.1(e)	7.7.2.1(e)	React Aggressıvely to Enemy Air Manoeuvre	5
7.7.2.1(f)	7.7.2.1(f)	Lımıt Exposure Usıng Terrain Maskıng	300
7.7 2.1(g)	7.4.2.1(b)	Respond to dısplayed RWR Threat Emission Information	10
7 7.2.1(h)	7.5 2.2(g)	Acquıre Enemy Contacts on LINK 16/MIDS Dısplays	30
7.7.2.2(a)	7.5 2.3(a)	Employ Tactical Deception	999
7.7 2 2(b)	7 5 2.3(b)	Dıspense Chaff	3
7.7.2.2(c)	7.5.2.3(c)	Employ Jammers	15
7 7.2 2(d)	7.5.2.3(d)	Employ BVR Deceptıon Tactıcs	300
7.7.2.3(a)	7.5.2 4(a)	Manoeuvre/Expose the Tactical Formatıon	30
7.7.2.3(b)	7.5.2.4(b)	Illuminate Enemy Air RWR	3
7.7.2.3(c)	7.5.2.4(c)	Enhance Enemy Air Radar Acquisition	20
7 7.2.3(d)	7.5.2.4(d)	Draw Enemy Air Away	300
7 7.2.3(e)	7.5.2.4(e)	Negate Enemy Air Weapons Employment	20
7.7.2.4(a)	7 5 2.5(a)	Deny Enemy Air Weapons Solution	999
7 7.2.4(b)	7 5.2.5(b)	Negate Enemy Aır Weapons Employment	30
7.7.2.4(c)	7 5.2.5(c)	Employ Air-to-Air RMD	120
7.7.2 4(d)	7.5 2.5(d)	Employ Air-to-Air IRMD	60

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7 7.2.4(e)	7.5.2.5(e)	Employ AAGD	45
7 7 2.4(f)	7 5.2.5(f)	Egress Engagement Safely	20
7.7.2.4(g)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information	10
7.7 2 4(h)	7.5.2.2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays	30
7.7 3 1(a)	7.5.2 3(a)	Employ Tactical Deception	999
7.7.3.1(b)	7.5.2.3(b)	Dispense Chaff	3
7.7 3 1(c)	7.5.2.3(c)	Employ Jammers	15
7.7 3 1(d)	7.5.2.3(d)	Employ BVR Deception Tactics	300
7.7.3.2(a)	7.5.2.6(a)	Manoeuvre Aircraft to Intercept Enemy	300
7.7.3.2(b)	7.5.2.5(b)	Negate Enemy Air Weapons Employment	30
7.7.3.2(c)	7.5.2.5(a)	Deny Enemy Air Weapons Solution	999
7.7.3.3(a)	7.5.2.4(a)	Manoeuvre/Expose the Tactical Formation	30
7.7.3.3(b)	7.5.2.4(b)	Illuminate Enemy Air RWR	3
7.7.3.3(c)	7.5.2.4(c)	Enhance Enemy Air Radar Acquisition	20
7 7.3 3(d)	7.5.2.4(d)	Draw Enemy Air Away	300
7 7.3.3(e)	7.5.2.4(e)	Negate Enemy Air Weapons Employment	20
7.7.3.5(a)	7.5.2.7(a)	Manoeuvre to a Weapons Engagement Zone	60
7 7.3.5(b)	7.2.2.1(g)	Validate Weapons Solution Display	2
7 7.3.5(c)	7.5.2.7(c)	Employ Weapons	10
7 7.3.5(d)	7.5.2.7(d)	Maintain Post Attack Offensive	60
7.7.3.5(e)	7 5 2.5(f)	Egress Engagement Safely	20
7 7.3.5(f)	7.5.2.7(f)	Assess Post Merge ACM Options	30
7.7.3.5(g)	7.5.2.7(g)	Monitor Weapon Fly Out	50
7 7.3.6(a)	7.5.2.5(a)	Deny Enemy Air Weapons Solution	999
7 7 3.6(b)	7 5 2.5(b)	Negate Enemy Air Weapons Employment	30
7 7 3 6(c)	7 5 2.5(c)	Employ Air-to-Air RMD	120
7.7 3.6(d)	7.5.2.5(d)	Employ Air-to-Air IRMD	60
7.7.3.6(e)	7.5.2.5(e)	Employ AAGD	45
7.7 3.6(f)	7.5.2.5(f)	Egress Engagement Safely	20
7.7.3.6(g)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information	10

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.7 3.6(h)	7.5.2 2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays	30
7 7.3.6(ı)	7.7.3.6(i)	Jettison External Stores	3
7.7.4.1(a)	7.4.2.1(a)	Conduct Visual Lookout	5
7.7 4.1(b)	7.4.2.1(b)	Respond to displayed RWR Threat Emission Information	10
7.7.4.1(c)	7.5.2.2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays	30
7.7.4 1(d)	7 4.2.1(g)	Conduct Vısual Lookout with NVG	7
7.7.4 1(e)	7.5.2.2(f)	Advıse on Vısually Acquıred SAM/AAA	5
7.7.5.1(a)	7.7 5.1(a)	Employ High Speed Flight	999
7.7.5.1(b)	7.7 5.1(b)	Employ Low Speed Flıght	999
7.7.5.1(c)	7.7.5.1(c)	Avoıd Threat Envelopes	15
7.7.5.1(d)	7.2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Dısplays	5
7.7 5 2(a)	7.4.2.1(b)	Analyse dısplayed RWR Threat Emissıon Informatıon	10
7.7.5.2(b)	7.5.2.3(c)	Employ Jammers	15
7.7 5.2(c)	7.5.2.3(b)	Dıspense Chaff	3
7 7.5.3(a)	7.7.2.1(f)	Limıt Exposure Using Terrain Maskıng	300
7.7.5.3(b)	7.7.5.3(b)	Employ Atmospheric Phenomena	60
7.7.6.1(a)	7.5 2.3(c)	Employ Jammers	15
7.7.6.1(b)	7 7.6.1(b)	Employ Defensive Counter Measures	60
7.7 6 2(a)	7.7.2.1(f)	Limit Exposure Usıng Terrain Maskıng	300
7.7.6.2(b)	7.7.5.3(b)	Employ Atmospherıc Phenomena	60
7.7 6.3(a)	7.7.6.3(a)	Employ Surface-to-Air RMD	60
7.7.6 3(b)	7.7.6.3(b)	Employ Surface-to-Aır IRMD	60
7.7.6 3(c)	7.5 2.5(e)	Employ AAAD	45
7.7.6 3(d)	7.7.3.6(i)	Jettison External Stores	3
7.7.6 4(a)	7.2.2.1(a)	Conduct A/G Check	15
7.7.6.4(b)	7.2.2.1(b)	Identify Initial Point Visually	5
7 7 6.4(c)	7.2 2 1(c)	Desıgnate/Add Offset at Inıtial Poınt	25
7 7.6.4(d)	7.2 2.1(d)	Manoeuvre to Weapons Delıvery Parameters	30
7.7.6.4(e)	7 2.2.1(b)	Identify Target/DMPI Visually	5
7.7.6.4(f)	7.2.2.1(f)	Conduct Element Split Attacks	70

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7 7.6.4(g)	7 2.2.1(g)	Validate Weapons Solution Display	2
7.7.6 4(h)	7 2.2.1(h)	Deliver GP Weapons(Bombs/Rx/Cluster/Gx)	3
7 7 6.4(I)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre	15
7 7 6.4(j)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre	15
7.7 6.4(k)	7.2.2.1(k)	Conduct BDA	5
7.7.6.4(l)	7.2.2.1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections	120
7 7 6.4(m)	7 2.2.1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays	5
7.7.6 4(n)	7.2.2.2(b)	Designate Target Position	25
7.7.6.4(o)	7.2.2.2(c)	Identify Target Area with Aircraft Sensors	10
7.7.6.4(p)	7.2 2.2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16	10
7.7 6 4(q)	7.2.2.2(g)	Deliver PGM (LGB/MAV/Adv PGM)	5
7.7.6.4(r)	7.2.2.2(h)	Conduct Self-Lasing LGB Delivery	50
7.7.6.4(s)	7.2.2.2(i)	Conduct Buddy-Lasing LGB Delivery	50
7.7.6.4(t)	7.2.2.2(j)	Update Target Designation	40
7 7.6.4(u)	7.2.2.1(i)	Conduct Safe Escape Manoeuvre	15
7.7.6.4(v)	7.2.2.1(n)	Search for Initial Point	10
7.7.6.4(w)	7.2.2.1(o)	Search for Target	4
7.7.6.4(x)	7.2.2.1(p)	Identify Initial Point with NVG	5
7.7.6 4(y)	7.2.2.1(p)	Identify Target/DMPI with NVG	5
7.7.6.4(z)	7.2.2.1(j)	Conduct Frag Avoidance Manoeuvre	15
7.8.1 1(a)	7.8.1.1(a)	Monitor Common Secure Voice Frequencies	999
7.8.1.1(b)	7.8 1.1(a)	Monitor Discreet Voice Frequencies	999
7.8 1 1(c)	7.8.1.1(c)	Monitor Broadcast Frequencies	999
7.8.2 1(a)	7.8.1.1(a)	Monitor Secure Voice Frequencies	999
7.8.2.1(b)	7 8.1.1(a)	Monitor Broadcast Frequencies	999
7.8.2.1(c)	7.8.1.1(c)	Monitor Broadcast Frequencies	999
7.8.3 1(b)	7.8 3.1(b)	Monitor Secure LINK 16 Frequencies	999
7.8.4.1(a)	7.8.1.1(a)	Monitor UHF Guard Frequency and Monitoring Mode	999
7.8.4.1(b)	7.8.1.1(a)	Monitor AM/FM Guard Frequency and Monitoring Mode	999
7.9.1 1(a)	7.9.1.1(a)	Monitor and Manage Tank Pressurization and Vent System	999

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.9.1.1(b)	7.9.1.1(b)	Monitor and Manage Fuel Quantity Indicating System	999
7.9.1.1(c)	7.9.1.1(c)	Monitor and Manage Fuel Feed Transfer	999
7.9.1 1(d)	7.9.1 1(d)	Monitor and Compare Fuel Flow Indications	999
7.9.1.1(e)	7.9.1.1(e)	Monitor and Manage Feed Tank Level	999
7 9.1.1(f)	7 9 1.1(f)	Monitor and Manage Fuel LO Indication	999
7 9.1.1(g)	7.9 1.1(g)	Monitor and Manage Bingo Fuel	999
7 9.1.1(h)	7.9.1.1(h)	Monitor and Manage Tactical Fuel	999
7 9 10.1(a)	7.9.10.1(a)	Monitor and Manage EGI Equipment	999
7.9.10.1(b)	7.9.10.1(b)	Monitor and Manage Navigation Aid Equipment	999
7.9.11.1(a)	7.9.11.1(a)	Monitor and Manage Radar	999
7.9 11.1(b)	7.9.11.1(b)	Monitor and Manage Jammers	999
7 9 11.1(d)	7.9.11.1(d)	Monitor and Manage RWR	999
7.9.11.1(e)	7.9.11.1(e)	Monitor and Manage AN/ALE-47	999
7.9.11.1(f)	7.9.11.1(f)	Monitor and Manage IFF Interrogator/Transponder (CIT)	999
7.9.11 1(g)	7.9.11.1(g)	Monitor and Manage LINK 16/MIDS	999
7.9.11.1(ı)	7.9 11.1(ı)	Monitor and Manage Stores Management Set	999
7.9.11.1(j)	7.9.11.1(j)	Monitor and Manage Weapons	999
7.9.11 1(k)	7.9.11.1(k)	Monitor and Manage Have Quick II	999
7.9 11.1(l)	7.9 11.1(l)	Monitor and Manage NVIS	999
7.9.12.1(a)	7.9.12.1(a)	Monitor and Manage Standard Exterior Lighting	999
7 9 12.1(b)	7.9.12.1(b)	Monitor and Manage Standard Interior Lighting	999
7.9.12.1(c)	7.9.12.1(c)	Monitor and Manage NVG Modified Exterior Lighting	999
7.9 12.1(d)	7.9.12.1(d)	Monitor and Manage NVG Modified Interior Lighting	999
7.9.13.1(a)	7.9.13.1(a)	Monitor and Manage Landing Gear System	999
7 9 13 1(b)	7.9.13.1(b)	Monitor and Manage Brake System	999
7.9 13 1(c)	7.9.13.1(c)	Monitor and Manage Arresting Hook System	999
7 9.2.1(a)	7.9 2.1(a)	Monitor Hydraulic 1 and 2 Pump Pressure Indicators and Reservoirs	999
7.9.2.1(b)	7.9.2.1(b)	Monitor and Manage APU and Brake Accumulators	999
7.9.3 1(a)	7.9.3.1(a)	Monitor and Manage Engine Performance	999
7.9.3.1(b)	7.9.3.1(b)	Monitor and Manage Throttle Controls	999

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7 9.3.1(c)	7.9.3.1(c)	Monitor and Manage Engine Anti-Ice System	999
7.9.3.1(d)	7.9.3.1(d)	Monitor and Manage Automatic Throttle Control (ATC)	999
7 9 3 1(e)	7 9 3.1(e)	Monitor Inspection of Inlet Duct Doors	999
7.9.3.1(f)	7.9.3.1(f)	Monitor and Manage Secondary Power Systems	999
7.9.4 1(a).	7.9.4 1(a).	Monitor and Manage Electrical Circuit Breakers	999
7.9.4.1(b)	7.9.4.1(b)	Monitor and Manage Generators	999
7.9 4 1(c)	7.9.4.1(c)	Monitor and Manage Transformer Rectifiers	999
7 9 4.1(d)	7.9.4.1(d)	Monitor and Manage Batteries	999
7 9.5.1(a)	7.9.5.1(a)	Monitor and Manage Pilot Controls	999
7.9.5.1(b)	7.9.5.1(b)	Monitor and Manage Primary Flight Controls	999
7 9.5.1(c)	7.9 5.1(c)	Monitor and Manage Secondary Flight Controls	999
7.9.5.1(d)	7.9.5.1(d)	Monitor and Manage FCS Status Display	999
7.9.5.1(e)	7.9.5.1(e)	Monitor and Manage Departure Warning Tone	999
7.9.5.1(f)	7.9.5.1(f)	Monitor and Manage Spin Recovery System	999
7.9 5 1(g)	7.9.5.1(g)	Monitor and Manage Control Augmentation System	999
7 9.5.1(h)	7.9.5.1(h)	Monitor and Manage Flight Control Computers (FCC)	999
7 9.5.1(i)	7.9 5.1(ı)	Monitor and Manage CAS Backup Systems	999
7.9.5.1(j)	7.9.5 1(j)	Monitor and Manage Wing Fold System	999
7.9.5.1(k)	7.9.5.1(k)	Monitor and Manage Automatic Flight Control System	999
7.9.6.1(a)	7.9.6.1(a)	Monitor and Manage Warning/Caution/Advisory Lights and Display	999
7.9.6.1(b)	7.9.6.1(b)	Monitor and Manage Master Caution Light and Tone	999
7 9.6.1(c)	7.9.6.1(c)	Monitor Voice Alert System	999
7.9.6.1(d)	7.9.6.1(d)	Monitor and Manage GPWS	999
7.9.6 1(e)	7.9.6.1(e)	Monitor and Manage Fire Detection/Extinguishing System	999
7 9.6.1(f)	7.9.6.1(f)	Monitor and Manage Canopy System	999
7.9.6.1(g)	7 9.6.1(g)	Monitor and Manage Ejection Seat System	999
7.9.6.1(h)	7 9.6.1(h)	Monitor and Manage Life Support Systems	999
7.9.7.1(a)	7.9 7 1(a)	Monitor and Manage Bleed Air Systems	999
7.9.7.1(b)	7 9.7.1(b)	Monitor and Manage Windshield Anti-Ice and Rain Removal Systen	999
7.9.7.1(c)	7.9.7.1(c)	Monitor and Manage Avionics Cooling and Pressurization	999

Goal ID	Source Goal	Goal Label	Goal Completion Time (s)
7.9 7 1(d)	7.9.7.1(d)	Monitor and Manage Cockpit Air-Conditioning and Pressurization	999
7.9.8.1(a)	7.9.8.1(a)	Monitor and Manage Pitot Static System	999
7.9 8 1(b)	7.9.8.1(b)	Monitor and Manage Standby Instruments	999
7.9 8 1(c)	7 9.8.1(c)	Monitor and Manage Radar Altimeter	999
7.9 8.1(d)	7.9 8 1(d)	Monitor and Manage AOA Indexer	999
7.9 8 1(e)	7.9.8 1(e)	Monitor and Manage Clock	999
7.9.9.1(a)	7.9 9 1(a)	Monitor and Manage Mission Computer System	999
7.9 9.1(b)	7.9.9.1(b)	Monitor and Manage Cockpit Controls and Displays	999
7.9.9.1(c)	7.9.9.1(c)	Monitor and Manage UFC	999
7.9.9 7(d)	7.9 9.7(d)	Monitor and Manage CVRS	999
7.9 9 7(e)	7.9.9.7(e)	Monitor and Manage Digital Displays VRS	999

Annex G

Goal Criticality

Annex G - CF18 Air to Ground Goal Criticality

Goal ID	Goal Label	TCR	ATCR	Results
7 1 1 1(a)	Identify TRP	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 1 1(b)	Conduct TRP Hold	5	5	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 1 1(c)	Search for TRP	5	5	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7.1.1 2(a)	Establish Radar Contact with Other Mission Elements	7	8	This task has high potential to adversely affect Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 1 2(b)	Establish Communications with Other Mission Elements	8	8	This task has high potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 1 2(c)	Establish Communications with Controlling Agency	8	8	This task has high potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 1 2(d)	Get Tactical Update and Area Brief	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement.
7 1 1 2(e)	Confirm Friendly Force and Adversary Disposition on LINK 16/MIDS	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 1 2(f)	Establish Visual Contact with Other Mission Elements	7	7	This task has high potential to adversely affect Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 1 2(g)	Establish AMIRS Contact with Other Mission Elements	6	7	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 1 2(h)	Establish NVG Contact with Other Mission Elements	7	8	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 1 1 3(c)	Conduct Formation Join-up	5	5	This task has moderate potential to adversely affect Safety, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 1 3(d)	Confirm Formation Position on LINK 16/MIDS Tactical Displays	7	8	This task has high potential to adversely affect Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 2.1(e)	Get Initial Target Brief	9	9	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 4 1(c)	Conduct Weapons Check-In with Controlling Agency	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 4 1(f)	Confirm Positive Radar Identification by Naval Controlling Agency	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 4 2(e)	Establish Radar Contact with Naval Ships	5	6	This task has moderate potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 4 2(f)	Deploy to CAP	5	5	This task has moderate potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 4 2(g)	Establish Visual Contact with Naval Ships	5	5	This task has moderate potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 4 2(i)	Establish AMIRS Contact with Naval Ships	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 4 2(l)	Establish NVG Contact with Naval Ships	7	8	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 5 1(b)	Establish Radar Contact with AAR	5	6	This task has moderate potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 5 1(c)	Establish Communications with AAR	5	5	This task has moderate potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 1 5 1(d)	Conduct Pre AAR RV Checks	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Reliability if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 5 1(e)	Establish Visual Contact with AAR	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 5 1(f)	Establish AMIRS Contact With AAR	5	6	This task has moderate potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 5 1(g)	Establish NVG Contact with AAR	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 5 2(a)	Conduct AAR Sensors to Visual Intercept	5	5	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 5 2(b)	Adopt AAR Towline Waiting Position	5	5	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 5 2(c)	Join In Echelon Position	5	5	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 5 2(d)	Position Astern AAR Hoses	5	5	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 5 2(e)	Conduct Pre-Contact AAR Checks	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Reliability if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 1 5 2(f)	Conduct AAR Sensors to NVG Intercept	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 1 1(a)	Reduce Aircraft Emissions (EMCON Procedures)	5	5	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 1 1(b)	Ingress at Low Altitude (Sophisticated Environment)	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 2 1 1(c)	Ingress at Medium/High Altitude (Permissive Environment)	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 1 1(d)	Descend to Low Altitude (Sophisticated Environment)	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 1 1(e)	Adjust to Medium/High Altitude (Permissive Environment)	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(a)	Conduct A/G Check	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(b)	Identify Initial Point Visually	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(c)	Designate/Add Offset at Initial Point	5	5	This task has moderate potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(d)	Manoeuvre to Weapons Delivery Parameters	5	5	This task has moderate potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(f)	Conduct Element Split Attacks	8	8	This task has high potential to adversely affect Safety, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(g)	Validate Weapons Solution Display	10	10	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(h)	Deliver GP Weapons(Bombs/Rx/Cluster/Gx)	10	10	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(i)	Conduct Safe Escape Manoeuvre	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(j)	Conduct Frag Avoidance Manoeuvre	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 2 2 1(k)	Conduct BDA	10	10	This task has high potential to adversely affect Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(l)	Conduct Coordinated Attacks with Other Aircraft/Elements/Sections	7	7	This task has high potential to adversely affect Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(m)	Monitor Target Area Tactical Picture on LINK 16/MIDS Displays	10	10	This task has high potential to adversely affect Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(n)	Search for Initial Point	5	5	This task has moderate potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(o)	Search for Target	10	10	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 1(p)	Identify Initial Point with NVG	5	6	This task has moderate potential to adversely affect Safety, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 2(b)	Designate Target Position	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 2(c)	Identify Target Area with Aircraft Sensors	7	8	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 2(e)	Identify Target Using Map/Imagery/Onboard Sensors/LINK 16	7	8	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 2(g)	Deliver PGM (LGB/MAV/Adv PGM)	10	10	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task meets or exceeds human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 2(h)	Conduct Self-Lasing LGB Delivery	10	10	This task has high potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 2 2(i)	Conduct Buddy-Lasing LGB Delivery	10	10	This task has high potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 2 2 2(j)	Update Target Designation	7	8	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 3 2(b)	Egress at Low Altitude	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 3 2(c)	Egress at Medium/High Altitude	5	5	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 3 2(d)	Conduct Lame Duck Procedures	5	5	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 4 1(a)	Pass IFREP	7	7	This task has high potential to adversely affect Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 4 2(a)	Conduct BD Check	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 4 2(b)	Conduct Fence Out Check	5	5	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 5 1(a)	Establish Tactical Roles - Tactical Leads and Wingmen	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 5 1(b)	Maintain Aircraft Control and Flight Position	5	5	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 5 1(c)	Execute Manoeuvre Turns	5	5	This task has moderate potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 5 2(a)	Optimize Formation for Tactical Situation	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 5 2(b)	Maintain Visual Mutual Support	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 2 5 2(c)	Maintain Positional Mutual Support	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 5 2(e)	Maintain Visual Mutual Support with NVG	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 5 2(f)	Communicate with Formation Members via Discreet Frequency	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 5 2(g)	Communicate with Formation Members via Data Link	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 1(a)	Maintain Ground Track	5	5	This task has moderate potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 1(b)	Adhere to ACO	9	9	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 1(c)	Adjust G/S to Make Tasking Timings	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 1(d)	Monitor and Avoid ACO Restricted Areas	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 2(a)	Navigate Using Visual References	5	5	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 2(b)	Navigate Using Sensors Information Displayed on HSD and DDIs	5	6	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 2(c)	Perform Navigation Systems Designations/Updates	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 2(d)	Employ Watch Map Ground Technique	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 2 6 2(c)	Arrive at Target at Predetermined TOT	8	8	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 2(f)	Navigate Using NVG Visual References	7	8	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 3(a)	Monitor and Avoid Weather	8	8	This task has high potential to adversely affect Safety, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 3(b)	Monitor and Avoid Obstacles	10	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 3(c)	Monitor and Avoid Terrain	10	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 6 3(e)	Monitor and Avoid Other Aircraft	10	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 1(a)	Monitor and Maintain Assigned Radar Sensor Search Parameters	5	6	This task has moderate potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed. The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 1(b)	Monitor and Maintain Radar Contact with Formation Members	7	8	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 1(c)	Monitor and Maintain Radar Contact with Lateral Mission Elements	5	6	This task has moderate potential to adversely affect Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 1(d)	Monitor and Maintain Radar Contact with Unknowns	7	8	This task has high potential to adversely affect Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 1(e)	Advise on Radar Acquired Unknowns	7	8	This task has high potential to adversely affect Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 1(f)	Radar Sort Multiple Unknown Contacts	5	6	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 2 7 1(g)	Interrogate Unknown Radar Contacts with IFF	9	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 1(h)	Monitor Tactical Picture on LINK 16/MIDS Displays	8	9	This task has high potential to adversely affect Safety, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 2(a)	Monitor and Maintain Assigned AMIRS Search Parameters	5	6	This task has moderate potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 2(b)	Monitor and Maintain AMIRS Contact with Formation Members	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 2(c)	Monitor and Maintain AMIRS Contact with Lateral Mission Elements	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7.2(d)	Monitor and Maintain AMIRS Contact with Unknowns	5	6	This task has moderate potential to adversely affect Safety, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 2(e)	Advise on AMIRS Acquired Unknowns	6	7	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 2(f)	Sort Multiple Unknown Contacts with AMIRS	5	6	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 2(g)	Interrogate Unknown AMIRS Contacts with IFF	9	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7.2 7 3(a)	Maintain Visual Search Patterns	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 3(b)	Monitor and Maintain Visual Contact with Formation Members	5	5	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 3(c)	Monitor and Maintain Visual Contact with Lateral Mission Elements	4	4	This task has moderate potential to adversely affect Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 2 7 3(d)	Monitor and Maintain Visual Contact with Unknowns	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 3(e)	Advise on Visually Acquired Unknowns	7	7	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 3(f)	Maintain NVG Visual Search Patterns	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 3(g)	Monitor and Maintain NVG Contact with Formation Members	8	9	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 3(h)	Monitor and Maintain NVG Contact with Lateral Mission Elements	3	4	This task has slight potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 2 7 3(i)	Monitor and Maintain NVG Contact with Unknowns	8	9	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 3 2 1(a)	Copy Target Brief from FAC	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 3 2 1(b)	Read Back Mandatory Items to FAC	7	7	This task has high potential to adversely affect Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 3 2 1(c)	Enter Target Location in Aircraft database	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 3 2 1(e)	Communicate with FAC via DATA LINK 16	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 3 2 2(a)	Receive Target Description Brief from FAC	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 3 2 2(b)	Find Target Using Sensors	10	10	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7.3.2 2(c)	Find Target Visually	10	10	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 3 2 2(d)	Communicate Target Acquired	9	9	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed. The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 3 2 2(e)	Describe Target Area and Target to FAC	8	8	This task has high potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7.3 2 2(f)	Conduct Target Run In	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7.3 2 2(h)	Find Target with NVG	10	10	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 4 2 1(a)	Conduct Visual Lookout	8	8	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 4 2 1(b)	Respond to displayed RWR Threat Emission Information	7	8	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 4 2 1(c)	Acquire Enemy Targets on LINK 16/MIDS Displays	7	8	This task has high potential to adversely affect Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 4 2 1(d)	Find Target with Radar Search Sort and Target Contract	5	6	This task has moderate potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 4 2 1(e)	Utilize Lateral Mission Element Tactical Information	5	5	This task has moderate potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 4 2 1(f)	Find Target with AMIRS Search Sort and Target Contract	5	5	This task has moderate potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 4 2 1(g)	Conduct Visual Lookout with NVG	7	8	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 4 2 2(a)	Report Target via LINK 16/MIDS Secure Communications	7	8	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 4 2 2(b)	Report Target via Have Quick II Secure Communications	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 4 2 2(c)	Utilize C2 Directive and Descriptive Commentary	6	6	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7.5 2 1(b)	Conduct CAP	5	5	This task has moderate potential to adversely affect Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 2(a)	Employ Radar Search Sort and Target Contract	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 2(d)	Initiate and Monitor EID of Unknowns	6	7	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 2(e)	Advise on Approaching Threats	8	8	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 2(f)	Advise on Visually Acquired Threats	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 2(g)	Acquire Enemy Contacts on LINK 16/MIDS Displays	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 2(h)	VID Unknowns	9	9	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7.5 2 2(l)	Employ AMIRS Search Sort and Target Contract	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 2(p)	VID Unknowns with NVG	9	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 5 2 3(a)	Employ Tactical Deception	5	5	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 3(b)	Dispense Chaff	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 3(c)	Employ Jammers	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 3(d)	Employ BVR Deception Tactics	5	5	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement.
7 5 2 4(a)	Manoeuvre/Expose the Tactical Formation	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 4(b)	Illuminate Enemy Air RWR	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 4(c)	Enhance Enemy Air Radar Acquisition	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 4(d)	Draw Enemy Air Away	7	7	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7.5 2 4(e)	Negate Enemy Air Weapons Employment	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 5(a)	Deny Enemy Air Weapons Solution	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 5(b)	Negate Enemy Air Weapons Employment	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 5(c)	Employ Air-to-Air RMD	10	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 5 2 5(d)	Employ Air-to-Air IRMD	10	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7.5 2.5(c)	Employ AAGD	10	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement.
7.5 2 5(f)	Egress Engagement Safely	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 6(a)	Manoeuvre Aircraft to Intercept Enemy	6	6	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7.5 2 7(a)	Manoeuvre to a Weapons Engagement Zone	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed. The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7.5 2 7(c)	Employ Weapons	10	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7.5 2 7(d)	Maintain Post Attack Offensive	8	8	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 7(f)	Assess Post Merge ACM Options	5	5	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 5 2 7(g)	Monitor Weapon Fly Out	5	5	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 2 1(a)	Generate Positive Closure	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 2 1(b)	Maintain Positive Closure	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 2 1(c)	Monitor and Obey AAR Lights	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 6 2 2(a)	Position Pitch Ladders	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 2 2(b)	Align Probe	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 2 3(a)	Pick Approach Reference	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 2 3(b)	Maintain Attitude References	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 2 3(c)	Make Contact	7	7	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 3 1(a)	Generate Maximum Fuel Transfer	1	1	This task has slight potential to adversely affect if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 3 3(a)	Generate Negative Closure	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 3 3(c)	Move to Astern Position	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 3 3(e)	Move to Outboard / Echelon Position	5	5	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 4 1(a)	Establish Departure Echelon Position	5	5	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 4 1(b)	Request Clearance to Depart	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 6 4 1(c)	Depart	5	5	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 7 2 1(a)	Manoeuvre the Tactical Formation	5	5	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 7 2 1(b)	Avoid Illuminating of the Enemy Air RWR	8	8	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 7 2 1(c)	Configure the Tactical Formation	8	8	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7.7 2 1(d)	Establish Diverging Paths	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 7 2 1(e)	React Aggressively to Enemy Air Manoeuvre	7	7	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 7 2 1(f)	Limit Exposure Using Terrain Masking	7	7	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 7 3 6(1)	Jettison External Stores	7	8	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 7 5 1(a)	Employ High Speed Flight	7	7	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 7 5 1(b)	Employ Low Speed Flight	7	7	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7.7 5 1(c)	Avoid Threat Envelopes	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7.7 5 3(b)	Employ Atmospheric Phenomena	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 7 6 1(b)	Employ Defensive Counter Measures	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 7 6 3(a)	Employ Surface-to-Air RMD	10	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 7 6 3(b)	Employ Surface-to-Air IRMD	10	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits. Further analysis of this task is unlikely to result in improvement
7 8 1 1(a)	Monitor Common Secure Voice Frequencies	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 8 1 1(c)	Monitor Broadcast Frequencies	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 8 3 1(b)	Monitor Secure LINK 16 Frequencies	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits. Further analysis of this task is unlikely to result in improvement
7 9 1 1(a)	Monitor and Manage Tank Pressurization and Vent System	5	6	This task has moderate potential to adversely affect Safety, Reliability if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 1 1(b)	Monitor and Manage Fuel Quantity Indicating System	5	6	This task has moderate potential to adversely affect Safety if improperly performed. The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 1 1(c)	Monitor and Manage Fuel Feed Transfer	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 1 1(d)	Monitor and Compare Fuel Flow Indications	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Reliability, Cost if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 1 1(e)	Monitor and Manage Feed Tank Level	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 1 1(f)	Monitor and Manage Fuel LO Indication	7	7	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 1 1(g)	Monitor and Manage Bingo Fuel	8	8	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 9 1 1(h)	Monitor and Manage Tactical Fuel	7	7	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 10 1(a)	Monitor and Manage EGI Equipment	7	8	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 10.1(b)	Monitor and Manage Navigation Aid Equipment	5	6	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 11 1(a)	Monitor and Manage Radar	9	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 11 1(b)	Monitor and Manage Jammers	8	9	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 11 1(d)	Monitor and Manage RWR	8	9	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 11 1(e)	Monitor and Manage AN/ALE-47	8	9	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 11 1(f)	Monitor and Manage IFF Interrogator/Transponder (CIT)	7	8	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 11 1(g)	Monitor and Manage LINK 16/MIDS	8	9	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 11 1(i)	Monitor and Manage Stores Management Set	7	8	This task has high potential to adversely affect Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 11 1(j)	Monitor and Manage Weapons	10	10	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 11 1(k)	Monitor and Manage Have Quick II	8	9	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 9 11 1(l)	Monitor and Manage NVIS	8	9	This task has high potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7.9 12 1(a)	Monitor and Manage Standard Exterior Lighting	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 12 1(b)	Monitor and Manage Standard Interior Lighting	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 12 1(c)	Monitor and Manage NVG Modified Exterior Lighting	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 12 1(d)	Monitor and Manage NVG Modified Interior Lighting	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 13 1(a)	Monitor and Manage Landing Gear System	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 13 1(b)	Monitor and Manage Brake System	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 13 1(c)	Monitor and Manage Arresting Hook System	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 2 1(a)	Monitor Hydraulic 1 and 2 Pump Pressure Indicators and Reservoirs	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 2 1(b)	Monitor and Manage APU and Brake Accumulators	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Reliability, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 3 1(a)	Monitor and Manage Engine Performance	7	8	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 3 1(b)	Monitor and Manage Throttle Controls	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 9 3 1(c)	Monitor and Manage Engine Anti-Ice System	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 3 1(d)	Monitor and Manage Automatic Throttle Control (ATC)	1	2	This task has slight potential to adversely affect if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 3 1(e)	Monitor Inspection of Inlet Duct Doors	1	2	This task has slight potential to adversely affect if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 3 1(f)	Monitor and Manage Secondary Power Systems	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 4 1(a)	Monitor and Manage Electrical Circuit Breakers	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 4 1(b)	Monitor and Manage Generators	5	6	This task has moderate potential to adversely affect Safety, Reliability if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 4.1(c)	Monitor and Manage Transformer Rectifiers	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 4 1(d)	Monitor and Manage Batteries	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency, Reliability, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 5 1(a)	Monitor and Manage Pilot Controls	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 5 1(b)	Monitor and Manage Primary Flight Controls	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 5 1(c)	Monitor and Manage Secondary Flight Controls	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 5 1(d)	Monitor and Manage FCS Status Display	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 9 5 1(e)	Monitor and Manage Departure Warning Tone	7	8	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 5 1(f)	Monitor and Manage Spin Recovery System	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 5 1(g)	Monitor and Manage Control Augmentation System	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency, Reliability, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 5 1(h)	Monitor and Manage Flight Control Computers (FCC)	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency, Reliability, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 5 1(i)	Monitor and Manage CAS Backup Systems	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency, Reliability, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 5 1(j)	Monitor and Manage Wing Fold System	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency, Reliability if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 5 1(k)	Monitor and Manage Automatic Flight Control System	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency, Reliability, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 6 1(a)	Monitor and Manage Warning/Caution/Advisory Lights and Displays	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 6 1(b)	Monitor and Manage Master Caution Light and Tone	7	7	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 6 1(c)	Monitor Voice Alert System	7	7	This task has high potential to adversely affect Safety if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 6 1(d)	Monitor and Manage GPWS	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 6 1(e)	Monitor and Manage Fire Detection/Extinguishing System	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 9 6 1(f)	Monitor and Manage Canopy System	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement.
7 9 6 1(g)	Monitor and Manage Ejection Seat System	10	10	This task has high potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 6 1(h)	Monitor and Manage Life Support Systems	10	10	This task has high potential to adversely affect Safety if improperly performed. The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 7 1(a)	Monitor and Manage Bleed Air Systems	5	6	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 7 1(b)	Monitor and Manage Windshield Anti-Ice and Rain Removal System	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Efficiency if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 7 1(c)	Monitor and Manage Avionics Cooling and Pressurization	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement.
7 9 7 1(d)	Monitor and Manage Cockpit Air-Conditioning and Pressurization	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 8 1(a)	Monitor and Manage Pitot Static System	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement.
7 9 8 1(b)	Monitor and Manage Standby Instruments	3	4	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 8 1(c)	Monitor and Manage Radar Altimeter	5	6	This task has moderate potential to adversely affect Safety if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 8 1(d)	Monitor and Manage AOA Indexer	1	2	This task has slight potential to adversely affect if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 8 1(e)	Monitor and Manage Clock	3	3	This task has slight potential to adversely affect Mission Effectiveness/Completion, Reliability if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement

Goal ID	Goal Label	TCR	ATCR	Results
7 9 9 1(a)	Monitor and Manage Mission Computer System	5	6	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 9 1(b)	Monitor and Manage Cockpit Controls and Displays	5	5	This task has moderate potential to adversely affect Safety, Mission Effectiveness/Completion if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 9 1(c)	Monitor and Manage UFC	3	3	This task has slight potential to adversely affect Safety, Mission Effectiveness/Completion, Cost if improperly performed The demands of this task do not approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 9 7(d)	Monitor and Manage CVRS	3	4	This task has slight potential to adversely affect Mission Effectiveness/Completion, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement
7 9 9 7(e)	Monitor and Manage Digital Displays VRS	3	4	This task has slight potential to adversely affect Mission Effectiveness/Completion, Cost if improperly performed The demands of this task approach human performance limits Further analysis of this task is unlikely to result in improvement

Annex H

Operational Sequence Diagrams

Chart held at DRDKIM

If you would like to view chart, please contact DRDKIM 2-2

Annex I

PCT Goal Analysis Results

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 1(b) **Goal:** that the Initial Point is identified Visually

Goal ID: 7 2 2 1(b) **Source Goal:** 7 2 2 1(b)

Description:
Look out and identify large features that help you to identify smaller features that make IP unique Identify IP visually as you over fly it Compare the visual image with the pre-studied Map of the IP or with the memorized image of the features identifying the IP

Operator: Pilot **Completion Time:** 5
Priority: 5 **Allowable Delay (K):** 1 5 **Difficulty (D)**
Interruptable: Yes **Sheddable:** Yes
Resumable: No **Shed If Late:** No
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: the search for IP has been completed

Initiating Actions: Identify features that will lead to IP identification
Ending Conditions: The Initial Point is identified Visually
Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:
Pattern recognition, key features to identify ground patterns visually

Situational:
Specific Initial Point features (e g terrain, large features surrounding IP, smaller unique IP features, weather, etc) Aircraft altitude and speed

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables None
Output Interface: None

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 3 Spatially coded

Internal Influenced Variables Belief that the Initial Point is Identified
Input Interface: Surrounding Ground, Initial Point Map

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2.2 1(c) **Goal:** that the target steering information is available and displayed

Goal ID: 7 2 2 1(c) **Source Goal:** 7 2 2 1(c)

Description:
Over fly designation First, ensure you are in NAV or A/G Master mode, then assign the TDC to the HSD Anticipate over fly of IP using external visual references Depress the TDC when you are accurately positioned over the point you want to designate If the wypt you have selected at the time happens to be an OAP (has offset data entered) then the MC assumes that you are overhead the OAP and automatically adds the offset information to the designation This only takes place for an over fly designation Confirm that the Target Wypt, distance and heading are displayed in the HUD and that they are accurate
Sensor designation First NAV designate the IP (or Offset aim point) With the TDC assigned to the desired display (Radar or the AMIRS), the designation is then adjusted by moving the TD diamond or the NAV stabilized

Operator: Pilot **Completion Time:** 25

Priority: 4 **Allowable Delay (K):** 1 3 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 3 Verbal encoding, decoding, speech production, listening

Initiating Conditions: Arriving over the IP

Initiating Actions: Designation of the Initial Point

Ending Conditions: Target steering information is available and displayed

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Equipment operating procedures Standard Operating procedures Designation procedures

Situational:

Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Details of on-going or planned activities

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables Target steering information activated and displayed

Output Interface: HUD and HSD

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief (or visual comparison with Map Information) that target information displays accurate steering/distance to the target

Input Interface: HUD and HSD Information on MAP

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 1(d) **Goal:** that the aircraft is in the desired position to release weapons **Goal ID:** 7 2.2 1(d) **Source Goal:** 7 2 2 1(d)

Description:
Conduct attack type desired to get to optimal delivery parameters Level Attack, Curvilinear Attack, Pop Up Attack, Curvi Pop Attack, and Loft/Toss
The pull up is generally done by applying 3 G, smoothly and rapidly raising the nose to the desired climb angle Adjust Power to achieve and maintain the desired IAS/TAS Anticipate the turn-in point and roll-in to the desired Dive angle by placing the Lift vector on the AOD (AIM Off Distance) Three G is normally used through the turn. Anticipate Velocity vector approaching the AOD, and conduct an unloaded roll to wings level at the desired dive angle
Adjust Power to achieve and maintain the desired IAS/TAS Adjust dive angle to the desired delivery angle and

Operator: Pilot **Completion Time:** 30
Priority: 3 **Allowable Delay (K):** **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Designated distance/time from the target

Initiating Actions: Manoeuver aircraft towards a weapons release solution
Ending Conditions: Aircraft has achieved Weapons Delivery Parameters
Ending Actions: Maintain stable platform for weapons release

KNOWLEDGE

Declarative:
Aircraft operating procedures. Tactics Standard Operating procedures Applicable orders, regulations and plans

Situational:
Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Details of on-going or planned activities

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g
Output Interface: Aircraft controls and throttles, HUD

INPUT/SENSATION

Vision: 2 Peripheral
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 5 Recall

Internal Influenced Variables Belief that the aircraft displayed parameters have achieved desired Weapons release parameters
Input Interface: HUD, Relative position to surrounding ground/terrain

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 1(c) **Goal:** that the Initial Point is identified Visually

Goal ID: 7 2 2 1(c) **Source Goal:** 7 2 2 1(b)

Description:
Look out and identify large features that help you to identify smaller features that make IP unique Identify IP visually as you over fly it Compare the visual image with the pre-studied Map of the IP or with the memorized image of the features identifying the IP

Operator: Pilot **Completion Time:** 5

Priority: 5 **Allowable Delay (K):** 1 5 **Difficulty (D)**

Interruptable: Yes **Sheddable:** Yes

Resumable: No **Shed If Late:** No

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: the search for IP has been completed.

Initiating Actions: Identify features that will lead to IP identification

Ending Conditions: The Initial Point is identified Visually.

Ending Actions: Stop attending to goal.

KNOWLEDGE

Declarative:

Pattern recognition, key features to identify ground patterns visually

Situational:

Specific Initial Point features (e g terrain, large features surrounding IP, smaller unique IP features, weather, etc) Aircraft altitude and speed

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables None

Output Interface: None

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2.3 Spatially coded

Internal Influenced Variables Belief that the Initial Point is Identified

Input Interface: Surrounding Ground, Initial Point Map

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 1(f) **Goal:** that the aircraft is positioned at the required time spacing over the target to avoid FRAG

Goal ID: 7 2 2 1(f) **Source Goal:** 7 2 2 1(f)

Description:

While flying in tactical formation, at the pre-planned range from the target, wingmen perform an energy sustaining 90 degrees turn into lead Roll out on perpendicular track and maintain heading for the required time (5-20sec) At the appropriate time or on a visual ground reference, wingmen turn back towards the target and conduct their own attack, having achieved the required time separation from their leads Wingmen then cross check that they have the required separation as lead is over flying the target and adjust the run-in accordingly

Operator: Pilot **Completion Time:** 70

Priority: 4 **Allowable Delay (K):** 1 3 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 1 Tone or Simple Auditory Sign

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Designated distance from the target.

Initiating Actions: Manoeuvre aircraft to conduct element split

Ending Conditions: Aircraft has the required timing spacing to conduct target attack

Ending Actions: Maintain timing spacing

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures

Situational:

Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Details of on-going or planned activities Type of weapons delivered

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, heading, speed Other formation Aircraft position and distance relative to own

Output Interface: Aircraft controls and throttles, HUD, Link 16/MIDS display

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 1 Tone or simple auditory signal

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 1 Automatised, highly learned perception

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the aircraft has achieved the desired timing spacing to conduct the attack

Input Interface: HUD, Link 16/MIDS display Other Formation Aircraft position

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 1(g) **Goal:** that the weapons solution is validated for weapons release **Goal ID:** 7 2 2 1(g) **Source Goal:** 7 2 2 1(g)

Description:
Confirm visually on the HUD that all required delivery parameters have been attained for release Ensure that the proper weapon is selected and that the TDC is assigned to the appropriate display for delivery Confirm visually on the HUD that the Master ARM is in the ARM position Visually confirm that the desired release symbology is displayed and is valid for release Confirm that the displayed aim point is on the DMPI (Desired Mean Point of Impact)

Operator: Pilot **Completion Time:** 2
Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Aircraft has achieved weapons release parameters and point of release is approaching
Initiating Actions: Visually confirm weapon solution
Ending Conditions: Weapons solution has been validated
Ending Actions: Monitor weapons solution

KNOWLEDGE

Declarative:
Aircraft operating procedures Tactics Standard Operating procedures Weapons operating procedures

Situational:
Mission requirements and objectives. Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Type of weapons delivered

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 0 None
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Weapons release symbology
Output Interface: HUD and Master Arm switch

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 0 None
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 4 Semantically coded

Internal Influenced Variables Belief that the weapons solution displayed is valid for weapons release
Input Interface: HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 1(h) **Goal:** that GP Weapons are delivered

Goal ID: 7 2 2 1(h) **Source Goal:** 7 2 2 1(h)

Description:
Depress and hold the weapons release button (Pickle button) on the stick Confirm that the weapons are being released Once all weapons have been released, release Pickle button Confirm weapons release on the SMS page on the DDI

Operator: Pilot **Completion Time:** 3

Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Weapons solution validated and aircraft is at release altitude and or range

Initiating Actions: Monitor displayed release symbology

Ending Conditions: All weapons have been released

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Weapons operating procedures

Situational:

Type of weapons released, weather conditions, visibility, winds, sun, terrain, target type

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables Weapons releasing from aircraft , Pickle button depression, Weapons release symbology

Output Interface: HUD, DDI, HOTAS, Pickle button

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 1 1 Simple stimulus

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the weapons have been delivered and that the symbology displays that fact

Input Interface: HUD, DDI, Aircraft movement at weapons release,

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 1(1) **Goal:** that the Aircraft is recovered safely and misses the ground by the desired altitude

Goal ID: 7 2 2 1(1) **Source Goal:** 7 2 2 1(1)

Description:
At the appropriate recovery altitude or when pull-up cue / breakaway X is displayed in the HUD, the pilot must achieve a 4-G pull-up manoeuvre within 1 5 seconds and hold the 4-G throughout the pullout until desired climb angle is achieved to meet the clearance criteria Adjust throttles to achieved and maintain desired recovery airspeed Cross check Baro or Radar altitude during recovery to ensure minimum altitude is not broken Increase G if required

Operator: Pilot **Completion Time:** 15

Priority: 1 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Weapons release is completed and/or aircraft at minimum recovery altitude, whichever comes first

Initiating Actions: Safe escape dive recovery initiated by pull up manoeuvre

Ending Conditions: Aircraft is at a safe altitude from the ground in the desired climbing attitude

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Recovery/pull up symbology

Situational:

Minimum recovery altitude, terrain, slope, weather, visibility

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles HUD, Safe escape auditory signals

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 1 1 Simple stimulus

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the desired safe escape attitude and the altitude above ground are achieved

Input Interface: HUD, Relation to the ground, Safe escape auditory signals

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 1(j) **Goal:** that the aircraft avoids the weapon frag pattern **Goal ID:** 7 2 2 1(j) **Source Goal:** 7 2 2 1(j)

Description:
Conduct turning safe escape manoeuvre, climbing safe escape manoeuvre, level straight through safe escape manoeuvre or recovery above weapon frag altitude
At the appropriate frag avoidance recovery altitude or distance, the pilot must achieve the desired G pull-up manoeuvre within 1 5 seconds and hold the G throughout the pullout until desired climb angle or heading away from target is achieved to meet the Frag clearance criteria Adjust throttles to achieved and maintain desired airspeed Cross check Baro, Radar altitude and range to target during avoidance manoeuvre to ensure minimum altitude or distance is not bracken Increase G if required

Operator: Pilot **Completion Time:** 15
Priority: 2 **Allowable Delay (K):** 1 1 **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Weapons release is completed and/or aircraft at minimum frag recovery altitude or range, whichever comes first.

Initiating Actions: Manoeuvre aircraft to conduct frag avoidance
Ending Conditions: Aircraft is at a safe distance from the weapons frag pattern
Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:
Aircraft operating procedures Tactics Standard Operating procedures Frag avoidance manoeuvres procedures.

Situational:
Type of weapon released, weather conditions, visibility, winds, sun, terrain, slope, target type Minimum frag avoidance altitude and or range

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Weapons frag pattern
Output Interface: HUD

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the aircraft is at a safe distance from the weapons frag pattern
Input Interface: HUD

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 1(k) **Goal:** that BDA is conducted

Goal ID: 7 2 2 1(k) **Source Goal:** 7 2 2 1(k)

Description:
After ensuring that Aircraft is safely recovered from delivery, if desired the target BDA can be conducted by assessing Bomb impact point and damage resulting from hit Visually assess the AMIRS display

Operator: Pilot **Completion Time:** 5

Priority: 8 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: Yes **Sheddable:** Yes

Resumable: No **Shed If Late:** No

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Aircraft is safely recovered from attack and weapon has impacted the target

Initiating Actions: Look at DDI

Ending Conditions: Target BDA is complete

Ending Actions: Memorize target BDA

KNOWLEDGE

Declarative:

Assessment of target battle damage on IR display Weapons effects

Situational:

Target type and size, Weapons type, Weapons impact angle, weather, distance, AMIRS magnification

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 0 None

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables None

Output Interface: DDI, AMIRS display

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 0 None

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

Internal Influenced Variables Belief that the target battle damage has been assessed

Input Interface: DDI, AMIRS display

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 1(n) **Goal:** that the area surrounding the IP and the IP are found visually

Goal ID: 7 2 2 1(n) **Source Goal:** 7 2 2 1(n)

Description:
Anticipate what the IP and surrounding area look like by reviewing the attack map visually or mentally When reviewing the map, recognize how your run-in ground track will bring you into and over the IP Look out and search for large features that help you to identify smaller features that lead your eyes to the IP

Operator: Pilot **Completion Time:** 10

Priority: 4 **Allowable Delay (K):** 1 65 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Specific range from the IP, within line of sight

Initiating Actions: Conduct visual search pattern

Ending Conditions: IP has been located.

Ending Actions: Monitor IP position for Identification and designation

KNOWLEDGE

Declarative:

Visual search pattern technique Pattern recognition, keys features to find ground patterns visually

Situational:

Specific Initial Point surrounding features (e g terrain, large features surrounding IP, smaller unique IP features, weather, etc)

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables None

Output Interface: None

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

Internal Influenced Variables Belief that IP has been located

Input Interface: Surrounding Ground, Initial Point Map

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 1(o) **Goal:** that the area surrounding the target and the target are found visually

Goal ID: 7 2 2 1(o) **Source Goal:** 7 2 2 1(o)

Description:
Anticipate what the target surrounding area look like by reviewing the target photos, Maps or data linked imagery visually or mentally When reviewing the target, recognize how your run-in ground track will bring you into and over the target
Look out and search for large features that help you to identify smaller features that lead your eyes to the Target Find DMPI

Operator: Pilot **Completion Time:** 4
Priority: 3 **Allowable Delay (K):** **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)
Initiating Conditions: Specific range from the target, within line of sight, during pull up manoeuvre .
Initiating Actions: Conduct visual search pattern
Ending Conditions: Target has been located
Ending Actions: Monitor Target position for Identification.

KNOWLEDGE

Declarative:
Visual search pattern technique Pattern recognition, key features to find ground patterns visually

Situational:
Specific Target surrounding features (e g terrain, large features surrounding Target, smaller unique target features, weather, etc)

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)
External Influenced Variables None
Output Interface: None

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 3 Spatially coded
Internal Influenced Variables Belief that Target has been located
Input Interface: Surrounding Ground and target features

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 2(b) **Goal:** that the target is designated and that the steering information is available and displayed

Goal ID: 7 2 2 2(b) **Source Goal:** 7 2 2 2(b)

Description:

First NAV designate the Target position (or Offset aim point) With the TDC assigned to the desired display (Radar or the AMIRS), the designation is then adjusted by moving the TD diamond or the NAV stabilized cursor designation When satisfied that the designation is accurately on the Target (or Offset point) add O/S if required (Pre-programmed) by depressing the appropriate push button on the HSD Confirm that the Target Wypt, distance and heading are displayed in the HUD and that they are accurate

Operator: Pilot **Completion Time:** 25

Priority: 4 **Allowable Delay (K):** 1 6 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Desired Range from the target

Initiating Actions: Nav designate the target

Ending Conditions: Target designation symbology is on the desired location for target area identification

Ending Actions: Keep target designation on the desired aim point

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Designation procedures Sensor displays and symbology interpretation

Situational:

General target Area features Range and distance from target

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables Target designation symbology

Output Interface: DDI,HUD

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the target designation symbology displayed is on the desired location

Input Interface: Sensor display on DDI

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 2(c) **Goal:** that the target area is identified with Aircraft Sensors

Goal ID: 7 2 2.2(c) **Source Goal:** 7 2 2 2(c)

Description:
Anticipate what the target surrounding area look like by reviewing the target photos, Maps or data linked imagery visually or mentally When reviewing the target, recognize how your run-in ground track will bring you into and over the target Visually look at the displayed target Area picture and search for large features that help you to identify smaller features Identify target Area

Operator: Pilot **Completion Time:** 10

Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Target has been designated, at the calculated range where magnification provides enough details for area ID.

Initiating Actions: Look at target area on DDI

Ending Conditions: Target Area has been identified

Ending Actions: Monitor displayed target Area for target Identification

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Sensor displays and symbology interpretation

Situational:

Specific target area features (e g terrain, large features surrounding target, weather, etc)

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 0 None

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 0 None

Memory: 5 Memorization

External Influenced Variables None

Output Interface: DDI

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the Area displayed on the DDI corresponds to the desired target surroundings

Input Interface: DDI

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 2(e) **Goal:** that the target is identified

Goal ID: 7 2 2 2(e) **Source Goal:** 7 2 2 2(e)

Description:
Anticipate what the target looks like by reviewing the target photos, Maps or data linked imagery visually or mentally When reviewing the target, recognize what the target image should look like on the displays. Adjust Sensors information displayed to optimize target resolution and recognition features Visually look at the target picture displayed on the Sensors tactical displays and search for large features that help you to identify smaller features Identify target

Operator: Pilot **Completion Time:** 10

Priority: 4 **Allowable Delay (K):** 1 3 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Target area has been identified on the Sensor display, at the calculated range where magnification provides enough details for target ID

Initiating Actions: Look at the target image on the DDI

Ending Conditions: Target is positively Identified

Ending Actions: Monitor target features to further confirm ID

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Anticipation of target representation on display for conditions of the day Interpretation of Map/Imagery/Onboard Sensors and symbology/LINK 16

Situational:

Specific target features (e g terrain, large features surrounding target, smaller unique target features, weather, etc) Target IR picture Surrounding IR picture Target Radar Picture Surrounding Radar picture

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables None

Output Interface: DDI, Maps, Photos

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the target displayed corresponds to the assigned target for attack

Input Interface: DDI, Maps Photos

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 2(g) **Goal:** that the PGM weapons are delivered

Goal ID: 7 2 2 2(g) **Source Goal:** 7 2 2 2(g)

Description:
Depress and hold the weapons release button (Pickle button) on the stick Confirm that the PGM weapons are being released Once all weapons have been released, release Pickle button Confirm weapons release on the SMS page on the DDI

Operator: Pilot **Completion Time:** 5

Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Weapons solution validated and at the release altitude and or range

Initiating Actions: Monitor displayed release symbology

Ending Conditions: Weapons have been released.

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Weapons operating procedures

Situational:

Type of weapon released, weather conditions, visibility, winds, sun, terrain, target type

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables Weapon release from aircraft , Pickle button depression, Weapons release symbology

Output Interface: HUD, DDI, HOTAS, Pickle button

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 1 Tone or simple auditory signal

Kinesthetic: 1 1 Simple stimulus

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 1 Automatised, highly learned perception

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the weapons have been delivered and that the symbology displays that fact

Input Interface: HUD, DDI, Aircraft movement at weapons release,

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 2(j) **Goal:** that the target designation symbology is on the desired target aim point **Goal ID:** 7 2 2 2(j) **Source Goal:** 7 2 2 2(j)

Description:
Adjust and update target designation on the desired aim point by moving the TDC If required, turn the aircraft to the right to ensure constant field of view to the target

Operator: Pilot **Completion Time:** 40

Priority: 3 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Target designation has move off the desired Aim point, or LGB has been released and is guiding to target

Initiating Actions: Depress and move the TDC

Ending Conditions: Designation has been kept on the desired aim point and/or weapons impact

Ending Actions: Monitor target designation

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Designation procedures Sensor displays and symbology interpretation

Situational:

Specific target area features (e g terrain, large features surrounding target, weather, etc), type of attack, type of weapon delivered

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Target designation symbology

Output Interface: HUD, DDI

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 1 1 Simple stimulus

Memory: 2 4 Semantically coded

Internal Influenced Variables Belief that the designation is on the desired target aim point

Input Interface: DDI

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 2 2(m) **Goal:** that the attack is coordinated with others to ensure safety and success **Goal ID:** 7 2 2 2(m) **Source Goal:** 7 2 2 1(l)

Description:
Maintain spacing by confirming that other Aircraft, Elements or Sections are conducting target attack as planned Ensure that own attack is conducted within the allotted time window Adjust spacing or routing to target to maintain required spacing from other Aircraft, Elements or Sections ahead Maintain lookout to ensure all collision potentials are avoided, and to provide mutual support. Change flight path as necessary

Operator: Pilot **Completion Time:**

Priority: 4 **Allowable Delay (K):** 1 3 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Designated range from target where attack has to be coordinated

Initiating Actions: Fly own attack as planned

Ending Conditions: Egress completed.

Ending Actions: Monitor other elements

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Mass attack coordination

Situational:

Number and type of aircraft involved Specific target area features (e.g terrain, large features surrounding target, weather, etc), type of attack, type of weapon delivered.

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

INPUT/SENSATION

Vision: 2 Peripheral

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 5 Complex operation

Internal Influenced Variables Belief that the egress has been completed

Input Interface: HUD, HSD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception

Audition: 0 None

Kinesthetic: 0 None

Memory: 5 Recall

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 3 1(a) **Goal:** that radar contact is established with formation members

Goal ID: 7 2 3 1(a) **Source Goal:** 7 1 1 2(a)

Description:
Adjust and/or confirm Radar parameters to ensure searching the desired airspace Observe Radar picture being built on the Radar display Confirm position of other mission elements by moving radar cursors over their displayed position and reading the displayed Bearing(or Bull eye)/Range/Altitude

Operator: Pilot **Completion Time:**

Priority: 4 **Allowable Delay (K):** 1 75 **Difficulty (D)**

Interruptable: **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Attack completed

Initiating Actions: Switch to Radar Air-to-Air search mode

Ending Conditions: Radar contact displayed on DDI

Ending Actions: Monitor Radar contact

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Radar operation

Situational:

Mission requirements and objectives. Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc)

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Radar symbology

Output Interface: DDI (Radar display), HUD

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the radar contact displayed corresponds to the formation member desired

Input Interface: DDI (Radar display), HUD

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 3 1(b) **Goal:** that the pilot confirms the position of the formation by visually referencing his Link 16 display on the HSD

Goal ID: 7 2 3 1(b) **Source Goal:** 7 1 1 3(d)

Description:
Adjust and/or confirm LINK 16/MIDS Tactical Display parameters to ensure the desired airspace is covered Reduce range scale to ensure clarity of displayed information Observe picture being built on the LINK 16/MIDS Tactical Display Visually confirm position of Formation members by analyzing displayed information Mentally build formation position and situational awareness

Operator: Pilot **Completion Time:**

Priority: 4 **Allowable Delay (K):** 1 75 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Tactical phase of mission begins

Initiating Actions: Visually reference Link 16 tactical display on HSD

Ending Conditions: Tactical phase of mission ends

Ending Actions: Stop visually referencing Link 16 tactical display on HSD

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, Link 16 displays/controls

Situational:

Tactical situation, phase of mission, mission objectives/requirements, correlation of displayed information with information displayed from other sources

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables HSD settings/controls Link 16 settings/controls

Output Interface: HOTAS HSD Link-16

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

Internal Influenced Variables Belief that the formation position has been confirmed on Link 16 tactical display

Input Interface: HSD, Link 16 Display/Controls

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 3 1(c) **Goal:** that the post-attack formation join-up is completed safely and expeditiously

Goal ID: 7 2 3 1(c) **Source Goal:** 7 1 1 3(c)

Description:

Formation Join-up is performed by using a combination of a visual overtake and cut-off angle
The cut-off angle is maintained by varying bank angle as the aircraft is moving up the reference line The geometry of the rejoin is such that an increase in speed will require a decrease in bank to maintain the cut-off angle and vice versa. Radar lock-on may be used to assist The Vc is monitored on the HUD and represent your true closure (both longitudinal and lateral)
Establish a crosscheck between speed, bank angle and the reference line The closure is then reduced as the desired formation position is attained
To rejoin in close formation, the aircraft is moved to one side about 2-3 aircraft widths and about 50 feet low 50 to

Operator: Pilot **Completion Time:**

Priority: 3 **Allowable Delay (K):** 1 5 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Individual attacks have been completed Formation join-up is required

Initiating Actions: Formation members begin to manoeuver IAW the pre-planned join-up procedure

Ending Conditions: Desired tactical formation is established

Ending Actions: Desired tactical formation is maintained

KNOWLEDGE

Declarative:

Standard operating procedures, aircraft controls and throttles, mission briefing

Situational:

Environmental conditions, relative formation following attack phase, surface-to-air and air-to-air threats in near proximity, timing/routing constaints

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 3 Complex and or unfamiliar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 5 Memorization/recall, calculation, estimation, deduction, reasoning

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Radar/AMIRS parameters.

Output Interface: Aircraft controls and throttles HUD Sensor displays

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 1 2 Complex stimulus

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 4 Spatial encoding

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the formation join-up has been conducted.

Input Interface: Visual cues Sensor information (AMIRS/Radar) Link 16

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 3 1(d) **Goal:** that visual contact is established with formation members **Goal ID:** 7 2 3 1(d) **Source Goal:** 7.1 1 2(f)

Description:
From SA built with Aircraft sensors and LINK 16/MIDS, look in the estimated bearing and range of the mission elements Start a visual search pattern focusing on the estimated distance of the contacts Find mission elements visually

Operator: Pilot **Completion Time:**
Priority: 4 **Allowable Delay (K):** 1 75 **Difficulty (D)**
Interruptable: **Sheddable:** No
Resumable: Yes **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)
Initiating Conditions: Attack completed
Initiating Actions: Start search pattern
Ending Conditions: Visual contact established
Ending Actions: Monitor visual contact

KNOWLEDGE

Declarative:
Visual search pattern technique

Situational:
Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Distance from visual contact

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)
External Influenced Variables None
Output Interface: None

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

INPUT/SENSATION

Vision: 2 Peripheral
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 3 Spatially coded
Internal Influenced Variables Belief that visual contact is established with formation member.
Input Interface: HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 3 1(e) **Goal:** that AMIRS contact is established with formation members **Goal ID:** 7 2 3 1(e) **Source Goal:** 7 1 1 2(g)

Description:
Adjust and/or confirm AMIRS parameters to ensure searching the desired airspace Observe IR picture being built on the AMIRS display Confirm position of other mission elements by moving AMIRS cursors over their displayed position and reading the displayed bearing and elevation

Operator: Pilot **Completion Time:**
Priority: 4 **Allowable Delay (K):** 1 75 **Difficulty (D)**
Interruptable: **Sheddable:** No
Resumable: Yes **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Attack completed

Initiating Actions: Switch to AMIRS Air-to-Air search mode
Ending Conditions: AMIRS contact displayed on DDI
Ending Actions: Monitor AMIRS contact

KNOWLEDGE

Declarative:
Aircraft operating procedures Tactics. Standard Operating procedures AMIRS operation

Situational:
Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc)

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables AMIRS symbology
Output Interface: DDI (AMIRS display), HUD

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 4 Semantically coded

Internal Influenced Variables Belief that the AMIRS contact displayed corresponds to the formation member desired
Input Interface: DDI (AMIRS display), HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 3 1(f) **Goal:** that visual contact with other formation members is established using NVGs

Goal ID: 7 2 3 1(f) **Source Goal:** 7 1 1 2(h)

Description:
From SA built with Aircraft sensors and LINK 16/MIDS, look in the estimated bearing and range of the mission elements Start a visual search pattern at the estimated location of the contacts Find mission elements visually with NVG

Operator: Pilot **Completion Time:**

Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)**

Interruptable: **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Tactical phase of mission begins Night, VMC flight conditions NVG contact with other formation members is required

Initiating Actions: Visual cues and other sensor information (Link 16/AMIRS/Radar) are used to begin NVG search for other formation member

Ending Conditions: NVG contact with other formation members is established

Ending Actions: Tactical phase of mission ends. Day and/or IMC flight conditions occur NVG contact with other formation members no longer required

KNOWLEDGE

Declarative:

Visual/NVG scan techniques, standard operating procedures, NVG operating procedures.

Situational:

Environmental conditions, tactical situation, mission objectives/requirements

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables None

Output Interface: NVGs

INPUT/SENSATION

Vision: 1.2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2.3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that NVG contact has been established with other formation members

Input Interface: NVG visual cues.

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 3 2(b) **Goal:** that the aircraft is Egressed at Low altitude

Goal ID: 7 2 3 2(b) **Source Goal:** 7 2 3 2(b)

Description:
Maintain constant altitude above ground by anticipating rising/descending terrain, and establish appropriate climb or descend Manoeuvre aircraft and visually confirm flight path by looking through Velocity Vector in the HUD Maintain desired Ground Speed by adjusting throttles appropriately Conduct visual Cross Check Perform terrain clearing tasks

Operator: Pilot **Completion Time:** 999

Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 3

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Post target RV completed

Initiating Actions: Fly aircraft towards next egress waypoint

Ending Conditions: Aircraft has crossed the FLOT Home Bound and transitions to RTB phase.

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Applicable orders, regulations and plans

Situational:

Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Details of on-going or planned activities

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1.2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD)

INPUT/SENSATION

Vision: 2 Peripheral

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the Aircraft has reached the end of the egress portion and is transitioning to RTB

Input Interface: HSD, HUD, Maps

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 5 1(a) **Goal:** that the tactical roles are established in the formation

Goal ID: 7 2 5 1(a) **Source Goal:** 7 2 5 1(a)

Description:
Individual responsibilities in addition to lookout are

Lead. terrain avoidance, navigation, tactical control of the formation, mission leader and bombs on target,

Number three terrain avoidance, back-up navigation, element position keeping, tactical control of number four, deputy mission and tactical lead and bombs on target,

Wingmen terrain avoidance, position keeping, lookout, bombs on target and monitor sensors

Operator: Pilot **Completion Time:** 999

Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 4

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Ingress is initiated

Initiating Actions: Attend to individual responsibilities

Ending Conditions: Tactical roles have been established.

Ending Actions: Continue attending to individual responsibilities

KNOWLEDGE

Declarative:

Tactics Standard Operating procedures Applicable orders, regulations and plans Formation responsibilities

Situational:

Position in the formation, threat, mission

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Formation position on Displays

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Radios

INPUT/SENSATION

Vision: 2 Peripheral

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

Internal Influenced Variables Belief that the tactical roles have been established

Input Interface: Aircraft displays (HUD,DDI,HSD) Radios

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 5 1(b) **Goal:** that aircraft control and flight position are maintained **Goal ID:** 7 2 5 1(b) **Source Goal:** 7 2 5 1(b)

Description:
Maintain aircraft control and position by adjusting Power, Aircraft pitch and roll to obtain desired Airspeed and Flight Path Adjust Flight position by using airspeed or geometry

Operator: Pilot **Completion Time:** 999
Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 2
Interruptable: **Sheddable:** No
Resumable: No **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Domestic portion completed, tactical portion initiated
Initiating Actions: Maintain aircraft control
Ending Conditions: Tactical portion of the mission completed
Ending Actions: Maintain aircraft control

KNOWLEDGE

Declarative:
Aircraft operating procedures Tactics. Standard Operating procedures Applicable orders, regulations and plans

Situational:
Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Details of on-going or planned activities

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Formation position on Displays
Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD)

INPUT/SENSATION

Vision: 2 Peripheral
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception
Audition: 0 None
Kinesthetic: 0 None
Memory: 5 Recall

Internal Influenced Variables belief that the aircraft is in controlled flight and that the tactical flight position has been achieved
Input Interface: Aircraft displays (HUD,DDI,HSD)

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 5 1(c) **Goal:** that a turn is executed to change direction while maintaining formation and mutual support

Goal ID: 7 2 5 1(c) **Source Goal:** 7 2 5 1(c)

Description:

Manoeuvre Turns are initiated either via voice on the Discreet frequency or by a wing flash from lead.
The check turn is accomplished by turning all formation members simultaneously of the desired angle, while keeping formation Check turns are typically 30 degrees
The in place turn is accomplished by turning all formation members simultaneously to 90-180 degrees
The delayed turn is accomplish by having one formation member turning to the desired heading while the remaining position his aircraft and initiates the turn to maintain formation
The cross turn is accomplished by turning towards each other and reestablishing formation after turn is completed

Operator: Pilot **Completion Time:** 30

Priority: 4 **Allowable Delay (K):** 1 75 **Difficulty (D)**

Interruptable: **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Radio call from lead, wing flash from lead, position enroute

Initiating Actions: Roll aircraft in the desired direction.

Ending Conditions: Desired heading has been attained and desired formation regained

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures. Formation keeping procedures

Situational:

Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Details of on-going or planned activities

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Formation position on Displays Aircraft position in relation to formation member

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD)

INPUT/SENSATION

Vision: 2 Peripheral

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Internal Influenced Variables belief that the manoeuvre turn has been completed and that the desired formation position has been regained

Input Interface: Aircraft displays (HUD,DDI)

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 5 1(d) **Goal:** that the pilot confirms the position of the formation by visually referencing his Link 16 display on the HSD

Goal ID: 7 2 5 1(d) **Source Goal:** 7 1 1 3(d)

Description:
Adjust and/or confirm LINK 16/MIDS Tactical Display parameters to ensure the desired airspace is covered Reduce range scale to ensure clarity of displayed information Observe picture being built on the LINK 16/MIDS Tactical Display Visually confirm position of Formation members by analyzing displayed information Mentally build formation position and situational awareness

Operator: Pilot **Completion Time:**

Priority: 4 **Allowable Delay (K):** 1 75 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Tactical phase of mission begins

Initiating Actions: Visually reference Link 16 tactical display on HSD

Ending Conditions: Tactical phase of mission ends

Ending Actions: Stop visually referencing Link 16 tactical display on HSD.

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, Link 16 displays/controls

Situational:

Tactical situation, phase of mission, mission objectives/requirements, correlation of displayed information with information displayed from other sources

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables HSD settings/controls Link 16 settings/controls

Output Interface: HOTAS HSD Link-16

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the formation position has been confirmed on Link 16 tactical display

Input Interface: HSD, Link 16 Display/Controls

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 5 2(a) **Goal:** that the ideal tactical formation is selected and flown **Goal ID:** 7.2 5 2(a) **Source Goal:** 7 2 5 2(a)

Description:
The lead will select the optimal formation for the tactical situation and direct his formation members to adopt formation
Wingmen will position their aircraft to optimize formation at the desired range and altitude delta from their lead

Operator: Pilot **Completion Time:** 999
Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)** 0 2
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 5 Voice Output
External Cue: No
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)
Initiating Conditions: The overall tactical situation has changed

Initiating Actions: Lead selects and directs new appropriate formation Wingmen initiate manouevers to achieve formation
Ending Conditions: Correct formation is achieved
Ending Actions: Correct formation is maintained

KNOWLEDGE

Declarative:
Tactics Standard Operating procedures Applicable orders, regulations and plans

Situational:
Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc)

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

External Influenced Variables All aircraft's positions, altitudes, attitudes, headings, speeds and g Aircraft's relative positions (formation)
Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD)

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 5 Speech input (attended to, salient to the primary task)
Kinesthetic: 0 None
Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 5 Verbal decoding, speech recognition
Kinesthetic: 0 None
Memory: 3 Spatial decoding

Internal Influenced Variables Lead's belief that present formation is ideal for present tactical situation
Wingmen's belief that they are in the correct position as directed by lead
Input Interface: Outside view Radar Link 16/MIDS display (for tactical picture) HUD, DDI

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 5 2(b) **Goal:** that all aspects of a proper visual lookout are conducted, including maintaining visual contact with other formation members

Goal ID: 7 2 5 2(b) **Source Goal:** 7 2 5 2(b)

Description:
Maintain visual mutual support by maintaining sight of formation members while establishing visual lookout
Conduct visual lookout responsibilities

Operator: Pilot **Completion Time:** 999

Priority: 9 **Allowable Delay (K):** 1.5 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: VMC flying conditions in a tactical arena

Initiating Actions: All formation members commence a continuous task-shared and appropriate crosscheck of various external cues, depending o

Ending Conditions: Mission ends or IMC conditions are encountered

Ending Actions: New appropriate crosschecks are initiated (I E IMC radar crosscheck)

KNOWLEDGE

Declarative:

Visual lookout technique Tactical formation flying Standard Operating Procedures

Situational:

Mission Plan Specifics of the tactical situation (c g threat/friendly forces, weather, terrain, etc)

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables None

Output Interface: Aircraft controls and throttles

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Perception that all aspects of visual lookout technique are being completed, and confirmation that all appropriate formation members are visual

Input Interface: Outside view, HUD

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 5 2(c) **Goal:** that awareness and good positioning is maintained on other formation members and/or formation elements using non visual methods

Goal ID: 7 2 5.2(c) **Source Goal:** 7 2 5 2(c)

Description:
Positional mutual support is maintained by keeping SA on formation members position utilizing sensors and data link Remain within sensor and weapons range to support formation members

Operator: Pilot **Completion Time:** 999

Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)**

Interruptable: **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 2 Speech Input (in background)

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Change in tactical environment with respect to beyond visual range formation members or other elements

Initiating Actions: Sensors and or datalink are checked to build updated tactical awareness of BVR friendlys and manouevers are initiated to mai

Ending Conditions: Appropriate tactical BVR formation is achieved

Ending Actions: Appropriate tactical BVR formation is maintained

KNOWLEDGE

Declarative:

Tactics Applicable orders, regulations and plans Standard Operating Procedures Sensor displays and symbology interpretation

Situational:

Mission Plan Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc)

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output

Psychomotor: 0 None

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production

Psychomotor: 0 None

Memory: 5 Memorization

External Influenced Variables None

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD). Radar AMIRS

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Internal Influenced Variables Perception that all formation elements are in position to give mutual support

Input Interface: Radar AMIRS Link 16/MIDS display (for tactical picture) HUD, DDI

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 5 2(e) **Goal:** that all aspects of a proper NVG visual lookout are conducted, including maintaining NVG visual contact with other formation members

Goal ID: 7 2 5 2(e) **Source Goal:** 7 2 5 2(e)

Description:
Maintain visual mutual support by maintaining sight with NVG of formation members while establishing visual lookout Conduct visual lookout responsibilities

Operator: Pilot **Completion Time:** 999

Priority: 9 **Allowable Delay (K):** 1 4 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 2 Passive monitoring of speech/auditory signals

Initiating Conditions: Night VMC flying conditions in a tactical arena

Initiating Actions: All formation members commence a continuous task-shared and appropriate crosscheck of various external cues using NVG's,

Ending Conditions: Mission ends or IMC conditions are encountered

Ending Actions: New appropriate crosschecks are initiated (I E IMC radar crosscheck)

KNOWLEDGE

Declarative:

NVG Visual lookout technique Night NVG tactical formation flying Standard Operating Procedures

Situational:

Mission Plan Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Weather conditions, visibility, ambient light

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 3 Complex and or unfamiliar

Memory: 1 *Commit to memory (LTM and STM)*

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 5 Memorization/recall, calculation, estimation, deduction, reasoning

Memory: 5 Memorization

External Influenced Variables None

Output Interface: Night Vision Goggles Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD)

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Perception that all aspects of NVG visual lookout technique are being completed, and confirmation that all appropriate formation members are NVG visual

Input Interface: Outside view through NVG's, HUD

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 5 2(f) **Goal:** that radio communications are transmitted using HOTAS switch **Goal ID:** 7 2 5 2(f) **Source Goal:** 7 2 5 2(f)

Description:
Communicate to other formation Members by pressing on the HOTAS radio switch

Operator: Pilot **Completion Time:** 5

Priority: 5 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: **Sheddable:** Yes

Resumable: Not Applicable **Shed If Late:** No

Feeds Back to Higher Level Goal No

Auditory Category: 5 Voice Output

External Cue: No

Cognitive Category: 2 Passive monitoring of speech/auditory signals

Initiating Conditions: A radio transmission is required

Initiating Actions: HOTAS radio trasmitter is depressed, and speech is initiated

Ending Conditions: Transmission is finished

Ending Actions: Transmission is received

KNOWLEDGE

Declarative:
Systems knowledge (radio) Standard radio terminology

Situational:
Any external cue

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output

Psychomotor: 1 1 Simple

Memory: 0 None

External Influenced Variables Level of radio clutter/emissions

Output Interface: Radios

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production

Psychomotor: 1 Automatised, highly learned

Memory: 0 None

INPUT/SENSATION

Vision: 0 None

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 0 None

Memory: 2 1 Accessible, familiar

Internal Influenced Variables Belief that transmission has left the radio

Input Interface: Radio

COGNITIVE/PERCEPTUAL PROCESS

Vision: 0 None

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 0 None

Memory: 1 Automatised

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 1(a) **Goal:** that correct ground track is maintained

Goal ID: 7 2 6 1(a) **Source Goal:** 7 2 6 1(a)

Description:
Accurately follow the Ground Track information displayed in the HSD and HUD Fly on the displayed heading required to the next waypoint Monitor heading, drift, routing and ground track information Make appropriate heading corrections to regain and maintain desired ground track

Operator: Pilot **Completion Time:** 999

Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 2

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Aircraft's track over ground changes, or requires a change

Initiating Actions: HSD and HUD are checked to adjust heading

Ending Conditions: Correct groundtrack is achieved

Ending Actions: Groundtrack is maintained and monitored

KNOWLEDGE

Declarative:

Sensor displays and symbology interpretation Basic navigation techniques

Situational:

Specific route and/or map Winds

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft heading

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

Internal Influenced Variables Perception that the aircrafts groundtrack corresponds to the desired groundtrack

Input Interface: HUD, DDI's, HSD, Map

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 1(b) **Goal:** that all aspects of an Air Coordination Order are followed **Goal ID:** 7 2 6 1(b) **Source Goal:** 7 2 6 1(b)

Description:
Adhere to Air Coordination Order by accurately following the ACO routing displayed on the HSD Follow ACO Airspeed, Altitude and routing restrictions

Operator: Pilot **Completion Time:** 999
Priority: 3 **Allowable Delay (K):** 1 2 **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)
Initiating Conditions: An ACO routing or restriction is encountered

Initiating Actions: HSD, Maps, and primary instruments(a/s, alt, etc) are monitored and crosschecked with ACO
Ending Conditions: ACO routing or restriction no longer applies
Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:
Sensor displays and symbology interpretation Applicable orders, regulations and plans Standard Operating procedures

Situational:
Specific ACO Mission Plan

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 0 None
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g
Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 0 None
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 3 Spatially coded

Internal Influenced Variables Belief that formation/aircraft is adhereing to planned ACO restriction
Input Interface: HUD, DDI's, HSD, Map

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 1(c) **Goal:** that correct groundspeed is flown in order to comply with timings

Goal ID: 7 2 6 1(c) **Source Goal:** 7 2 6 1(c)

Description:
Adjust G/S by increasing or decreasing IAS Monitor ETA over waypoint on the HSD and fine tune G/S as required to arrive at required timing.

Operator: Pilot
Priority: 6
Interruptable: Yes
Resumable: No
Completion Time: 10
Allowable Delay (K):
Difficulty (D) 0.1
Sheddable: No
Shed If Late: Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: A required timing exists in the future

Initiating Actions: Groundspeed is checked and adjusted based on other timings and navigation/HSD information
Ending Conditions: Timing is met
Ending Actions: Groundspeed is adjusted based on the next required timing, or groundspped becomes a nonessential item

KNOWLEDGE

Declarative:
Sensor displays and symbology interpretation Basic navigation techniques

Situational:
Specific route and/or map Mission Plan Winds

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, attitude, heading, speed and g
Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 0 None
Memory: 2.3 Spatially coded

Internal Influenced Variables Perception that groundspeed is appropriate for next timing
Input Interface: HUD, DDI's, HSD, Map

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 1(d) **Goal:** that all Air Coordination Order restricted area's are avoided **Goal ID:** 7 2 6 1(d) **Source Goal:** 7 2 6 1(d)

Description:
Avoid ACO restricted areas by monitoring HSD displayed information and verifying information on the Area MAP

Operator: Pilot **Completion Time:** 999
Priority: 3 **Allowable Delay (K):** 1 25 **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)
Initiating Conditions: An ACO restricted area is encountered

Initiating Actions: HSD and Maps are monitored and crosschecked with ACO
Ending Conditions: ACO restricted area no longer applies
Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:
Sensor displays and symbology interpretation Applicable orders, regulations and plans Standard Operating procedures

Situational:
Specific ACO Mission Plan

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 0 None
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g
Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 0 None
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 3 Spatially coded

Internal Influenced Variables Belief that formation/aircraft is avoiding ACO restricted area
Input Interface: HUD, DDI's, HSD, Map

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 2(a) **Goal:** that correct navigation is carried out and confirmed through visual ground references

Goal ID: 7 2 6 2(a) **Source Goal:** 7 2 6 2(a)

Description:
Conduct Navigation by visually finding ground references to verify that the correct routing is followed

Operator: Pilot **Completion Time:** 10

Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0.15

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Navigation is required in VMC conditions

Initiating Actions: Outside visual cues are crosschecked with maps to ensure correct navigation

Ending Conditions: IMC conditions are encountered or mission ends

Ending Actions: Other navigation techniques(HSD) are used exclusively

KNOWLEDGE

Declarative:

Basic navigation techniques Sensor displays and symbology interpretation

Situational:

Specific route and/or map Mission Plan

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles HUD Maps

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Perception that visual ground references match those expected from map (and/or memory)

Input Interface: Outside view, HUD, Map

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 2(b) **Goal:** that correct navigation is carried out and confirmed through HSD (sensor) information

Goal ID: 7 2 6 2(b) **Source Goal:** 7 2 6 2(b)

Description:
Select routing on the HSD System navigation in the CF-18 is simply a matter of following the displayed routing information on the HSD

Operator: Pilot **Completion Time:** 10

Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 15

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: General navigation is required

Initiating Actions: HSD is crosschecked with maps

Ending Conditions: Mission ends or more specific navigation aids are required (I E. approach aids)

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Sensor displays and symbology interpretation Basic navigation techniques

Situational:

Specific route and/or map Mission Plan

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 0 None

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 0 None

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Perception that sensor information match those expected from map (and/or memory)

Input Interface: HUD, DDI's, HSD, Map

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 2(c) **Goal:** that navigation systems are updated, or specific points are designated, using one of various systems/methods

Goal ID: 7 2 6 2(c) **Source Goal:** 7 2 6 2(c)

Description:

NAVDSG Conduct a NAVDSG by first selecting the desired WAYPOINT/OAP on the HSD Then press (tile 15) on the HSD

Over fly Designation First, ensure you are in NAV or A/G Master mode, then assign the TDC to the HSD and depress the TDC when you are accurately positioned over the point you want to designate

HUD Reticle Designation Select the system in NAV or A/G Master Mode and undesignate Ensure that the weapons system is in AUTO, and assign the TDC to the HUD Manoeuvre the a/c until the reticle is over the target

Operator: Pilot **Completion Time:** 15

Priority: 3 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: The navigation systems require either enhanced precision or a temporary target designation

Initiating Actions: TDC is assigned to appropriate DDI or HUD TDC button is depressed and slewed, or NAVDES is selected on HSD

Ending Conditions: Update is accepted or Designation is deemed acceptable

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Designation procedures Sensor displays and symbology interpretation

Situational:

Mission Plan Target and/or IP knowledge (terrain, large features surrounding Target, smaller unique target features, weather, etc)

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps, Radar, AMIRS, Mav display

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Internal Influenced Variables Perception that desired update/designation point (from map and/or memory) has been identified and selected

Input Interface: Outside view HUD,DDI,HSD Maps, Radar display, AMIRS display, Mav display

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 2(d) **Goal:** that the basic external navigation technique "watch/map/groud," is employed to ensure accurate navigation

Goal ID: 7 2 6 2(d) **Source Goal:** 7 2 6 2(d)

Description:
The Elapsed Time is checked and a point ahead of the associated Elapsed Time marking on the map is selected for identification When this point is identified on the ground then the navigation errors can be determined and a correction can be made Common methods for correcting back to track or for getting back on time are Track corrections and Time corrections

Operator: Pilot **Completion Time:** 20
Priority: 4 **Allowable Delay (K):** 1 75 **Difficulty (D)**
Interruptable: Yes **Sheddable:** No
Resumable: No **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Precise navigation is required in a preplanned day low level routing

Initiating Actions: A Timer(watch) is verified for the planned position, a map is verified for features expected at position, and outside references(
Ending Conditions: Position is verifed or navigation corrections are made
Ending Actions: Process is reinitiated, or other navigation techniques are employed

KNOWLEDGE

Declarative:
Basic navigation techniques

Situational:
Specific route and/or map Mission Plan Weather conditions, visibility,
winds, sun, terrain

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables None
Output Interface: Aircraft controls and throttles HUD Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Spatial decoding

Internal Influenced Variables Perception that the map information(taken from watch information) corresponds to the visual ground references
Input Interface: Outside view, HUD, map

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 2(e) **Goal:** that the Time on Target is achieved accuratly through adjustments of aircraft speed and routing

Goal ID: 7 2 6 2(c) **Source Goal:** 7 2 6 2(e)

Description:
Adjust G/S and routing to arrive at target at predetermined TOT

Operator: Pilot **Completion Time:** 999

Priority: 4 **Allowable Delay (K):** 1 4 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: A "Time on Target" is pending

Initiating Actions: Groundspeed is referenced and adjusted vs HSD TOT information and navigation

Ending Conditions: TOT is achieved

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Sensor displays and symbology interpretation Basic navigation techniques

Situational:

Specific route and/or map Mission Plan

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

Internal Influenced Variables Perception that groundspeed and route is appropriate for TOT

Input Interface: Outside view,HUD, DDI, HSD, map

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6.2(f) **Goal:** that correct navigation is carried out and confirmed through NVG visual ground references

Goal ID: 7 2 6 2(f) **Source Goal:** 7 2 6 2(f)

Description:
Conduct Navigation by visually finding ground references with NVG to verify that the correct routing is followed

Operator: Pilot **Completion Time:** 20

Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 4

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Navigation is required in Night/VMC conditions

Initiating Actions: Outside NVG visual cues are crosschecked with maps to ensure correct navigation

Ending Conditions: IMC conditions are encountered or mission ends

Ending Actions: Other navigation techniques(HSD) are used exclusively

KNOWLEDGE

Declarative:

NVG lookout techniques. Sensor displays and symbology interpretation Basic navigation techniques

Situational:

Specific route and/or map Mission Plan Weather conditions, visibility, ambient light

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 3 Complex and or unfamiliar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 5 Memorization/recall, calculation, estimation, deduction, reasoning

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Night Vision Goggles Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Perception that NVG visual ground references match those expected from map (and/or memory)

Input Interface: Outside view through NVG's, HUD, Map

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 3(a) **Goal:** that all significent weather is avoided using both visual and sensor cues **Goal ID:** 7 2 6 3(a) **Source Goal:** 7 2 6 3(a)

Description:
Monitor by visually looking outside the cockpit at significant weather build ups Adjust sensors parameter to optimize weather detection and monitor displayed weather on the DDIs Avoid weather by changing routing and flight profile

Operator: Pilot **Completion Time:** 10
Priority: 2 **Allowable Delay (K):** 1 1 **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Significent weather is encountered
Initiating Actions: Outside cues and/or radar is monitored and aircraft is manoeuvered to avoid weather
Ending Conditions: Weather is no longer a factor
Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:
Basic Flying Sensor displays and symbology interpretation

Situational:
Visual Lookout Cues Radar cues Study of weather forecast and actual weather

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g
Output Interface: Radar Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 3 Spatially coded
Internal Influenced Variables Perception that aircraft/formation will avoid significent weather
Input Interface: Outside view, radar display, HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 3(b) **Goal:** that all obstacles are avoided **Goal ID:** 7 2 6 3(b) **Source Goal:** 7 2 6 3(b)

Description:
Monitor obstacles visually Avoid obstacles by changing routing and flight path

Operator: Pilot **Completion Time:** 999
Priority: 1 **Allowable Delay (K):** **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: An obstacle is encountered

Initiating Actions: Manoeuvre to avoid obstacle
Ending Conditions: Obstacle is avoided, or obstacle avoidance no longer becomes a factor (high level)
Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:
Basic Flying

Situational:
Visual Lookout Cues Knowledge of area obstacles (map study) Specific mission plan

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g
Output Interface: Aircraft controls and throttles HUD Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

INPUT/SENSATION

Vision: 2 Peripheral
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 1 Accessible, familiar
Internal Influenced Variables Perception that aircraft is not in conflict with an obstacle
Input Interface: Outside view, HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 1 Automatised

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 3(c) **Goal:** that all terrain is avoided **Goal ID:** 7 2 6 3(c) **Source Goal:** 7 2 6 3(c)

Description:
At all times while flying in the low-level environment the primary task is terrain clearance Monitor terrain visually Avoid terrain by changing flight path

Operator: Pilot **Completion Time:** 999
Priority: 1 **Allowable Delay (K):** **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Terrain is encountered

Initiating Actions: Manoeuvre to avoid terrain
Ending Conditions: Terrain is avoided or no longer becomes a factor (high level)
Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:
Basic Flying

Situational:
Visual Lookout Cues Knowledge of area terrain (map study) Specific mission plan

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g
Output Interface: Aircraft controls and throttles HUD Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

INPUT/SENSATION

Vision: 2 Peripheral
Audition: 1 Tone or simple auditory signal
Kinesthetic: 1 1 Simple stimulus
Memory: 2 1 Accessible, familiar
Internal Influenced Variables Perception that aircraft is not in conflict with terrain
Input Interface: Outside view, HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception
Audition: 1 Automatised, highly learned perception
Kinesthetic: 1 Automatised, highly learned perception
Memory: 1 Automatised

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 6 3(e) **Goal:** that all other aircraft are avoided

Goal ID: 7 2 6 3(e) **Source Goal:** 7 2 6 3(e)

Description:
Monitor other Aircraft by establishing cross check between visual look out and sensor information displayed on the HUD and DDIs Avoid other Aircraft by changing flight path

Operator: Pilot **Completion Time:** 999

Priority: 1 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 2 Passive monitoring of speech/auditory signals

Initiating Conditions: An aircraft or formation is encountered

Initiating Actions: Manoeuvre to avoid aircraft

Ending Conditions: Aircraft is avoided

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Basic Flying

Situational:

Visual Lookout Cues Specific mission plan

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles HUD Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

INPUT/SENSATION

Vision: 2 Peripheral

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 1 1 Simple stimulus

Memory: 2 1 Accessible, familiar

Internal Influenced Variables Perception that aircraft is not in conflict with another aircraft

Input Interface: Outside view, HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 1 Automatised, highly learned perception

Memory: 1 Automatised

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 7 1(a) **Goal:** that the desired radar modes and parameters are set for search and monitored by visually referencing the radar display on the right DDI

Goal ID: 7 2 7 1(a) **Source Goal:** 7 2 7 1(a)

Description:
Confirm that the desired Radar modes and parameters are set for search Monitor radar visually on the DDIs Adjust radar azimuth and elevation search to cover assigned airspace

Operator: Pilot **Completion Time:** 3

Priority: 4 **Allowable Delay (K):** 1 75 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Begin the tactical phase of the mission

Initiating Actions: Pilot observes the radar search parameters on the radar display on the right DDI

Ending Conditions: Tactical phase of the mission ends

Ending Actions: Perform other non-tactical mission tasks

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, radar displays/controls

Situational:

Tactical situation, aircraft altitude/speed, mission objectives/requirements, weather, terrain

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables radar search modes, radar antenna elevation, radar azimuth, other radar parameters

Output Interface: DDI, HOTAS, APG-73

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading

Audition: 0 None

Kinesthetic: 1 1 Simple stimulus

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding

Audition: 0 None

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the assigned radar search parameters have been set and are being monitored and maintained

Input Interface: Radar display on right DDI

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 7 1(b) **Goal:** that radar contact on formation members is monitored and maintained by referencing the APG-73 display on the right DDI

Goal ID: 7 2 7 1(b) **Source Goal:** 7 2 7 1(b)

Description:
To monitor radar contact on formation members, the pilot will visually reference his radar display on his right DDI He will also adjust the settings on his APG 73, most notably the azimuth, PRF, and elevation (using either HOTAS or manual pushbuttons), to allow him to maintain radar contact on friendly formation members

Operator: Pilot **Completion Time:** 4
Priority: 4 **Allowable Delay (K):** 1 67 **Difficulty (D)**
Interruptable: Yes **Sheddable:** No
Resumable: Yes **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Radar contact with formation members is established
Initiating Actions: Right DDI is visually referenced for radar contact information and current radar parameters.
Ending Conditions: Radar contact on formation members no longer required
Ending Actions: Pilot returns radar to assigned search parameters

KNOWLEDGE

Declarative:
Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, radar displays/controls

Situational:
Tactical situation, phase of mission, target information (bearing,range,altitude,aspect), mission objectives/requirements

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

External Influenced Variables Radar search and track modes, radar antenna elevation, radar azimuth, other radar parameters Other formation member's RWR
Output Interface: DDI, HOTAS, APG-73

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 3 Verbal decoding

Internal Influenced Variables Belief that radar contact is being maintained on other formation members
Input Interface: Radar display on right DDI correlated with other independent information (AMIRS, Link-16, visual, external agency, air-to-air tacan, communications)

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 7 1(h) **Goal:** that the pilot accurately monitors and interprets the tactical Link-16 information displayed on his HSD

Goal ID: 7 2 7 1(h) **Source Goal:** 7 2 7 1(h)

Description:
The pilot will visually reference his HSD to monitor the Link 16 display

Operator: Pilot **Completion Time:** 5

Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Tactical phase of the mission begins Link 16 information is required by the pilot

Initiating Actions: Pilot visually references the Link 16 display on the HSD

Ending Conditions: Link 16 information is no longer required and/or the tactical phase of the mission ends

Ending Actions: Current mission tasks performed Tactical Link 16 information, displayed on the HSD, is no longer monitored

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, Link 16 displays/controls

Situational:

Tactical situation, phase of mission, mission objectives/requirements, correlation of displayed information with information displayed from other sources

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 0 None

Memory: 1 *Commit to memory (LTM and STM)*

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 0 None

Memory: 5 Memorization

External Influenced Variables Link 16 display settings and parameters

Output Interface: HSD, LINK-16

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2.4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the tactical situation is being monitored on the Link 16 display, and all relevant tactical information is being interpreted by the pilot

Input Interface: Link 16 display on HSD, correlation of other tactical information (radar/AMIRS/external agencies) with Link 16 displayed information

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 7 2(a) **Goal:** that the assigned AMIRS search parameters are set and monitored by visually referencing the AMIRS display on the left DDI

Goal ID: 7 2 7 2(a) **Source Goal:** 7 2 7 2(a)

Description:
The pilot will set his assigned AMIRS search parameters via HOTAS or manual selection He will monitor and maintain these parameters by visually checking the AMIRS display on the left DDI If they need adjusting, he will accomplish this via HOTAS/manual selection of the AMIRS search parameters on the left DDI

Operator: Pilot **Completion Time:** 2
Priority: 4 **Allowable Delay (K):** 1 75 **Difficulty (D)**
Interruptable: **Sheddable:** No
Resumable: No **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)
Initiating Conditions: Tactical phase of the mission begins. Tactical IR imagery is required by the pilot while operating in day/night VMC conditions
Initiating Actions: TDC assigned to the left DDI Pilot visually checks the current AMIRS search parameters displayed on the left DDI
Ending Conditions: Tactical phase of mission ends AMIRS information no longer required IMC flight conditions encountered
Ending Actions: TDC re-assigned away from left DDI AMIRS display no longer monitored.

KNOWLEDGE

Declarative:
Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, AMIRS displays/controls

Situational:
Tactical situation, aircraft altitude/speed, mission objectives/requirements, atmospheric conditions, terrain, time of day

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

External Influenced Variables AMIR search modes, AMIRS search parameters
Output Interface: DDI, HOTAS, AMIRS

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the assigned AMIRS search parameters have been set and are being maintained
Input Interface: AMIRS display on the left DDI

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 7 2(b) **Goal:** that AMIRS contact on formation members is displayed and monitored by visually referencing the AMIRS display on the LEFT DDI

Goal ID: 7 2 7 2(b) **Source Goal:** 7 2 7 2(b)

Description:
To monitor AMIRS contact on formation members, the pilot will visually reference his AMIRS display on his left DDI He will also adjust the settings on his AMIRS, using either HOTAS or manual pushbuttons, to allow him to maintain AMIRS contact on formation members

Operator: Pilot **Completion Time:** 4
Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)**
Interruptable: **Sheddable:** No
Resumable: No **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: AMIRS contact with formation members is established
Initiating Actions: Left DDI is visually referenced for AMIRS contact information and current AMIRS parameters
Ending Conditions: AMIRS contact on formation members is no longer required
Ending Actions: Return AMIRS to assigned search parameters

KNOWLEDGE

Declarative:
Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, AMIRS displays/controls

Situational:
Mission objectives/requirements, tactical situation, environmental conditions, time of day, target information (bearing,range,aspect,altitude)

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

External Influenced Variables AMIRS search and track modes, AMIRS search parameters
Output Interface: DDI, HOTAS, AMIRS

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 3 Verbal decoding

Internal Influenced Variables Belief that AMIRS contact on other formation members is being maintained
Input Interface: AMIRS display on left DDI correlated with other independent information (radar/visual/air-to-air tacan/Link-16/external agency/communications)

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 7 3(a) **Goal:** that no visually unobserved bogeys/bandits are able to engage the formation

Goal ID: 7 2 7 3(a) **Source Goal:** 7 2 7 3(a)

Description:

The pilot will maintain a methodical visual search pattern throughout the entire mission to ensure that no unobserved bogeys/bandits are able to engage his formation without being visually observed

He accomplishes this by developing a scanning pattern that allows him to scan all of the airspace around his aircraft in a deliberate, sequential fashion For example, he may start by observing his deep six o'clock position, then scan out the left side of the canopy until arriving at the 12 o'clock position He will repeat the same process on the right side of the aircraft, then search the extreme vertical above and below his aircraft This visual search pattern is then repeated throughout the mission

Operator: Pilot **Completion Time:** 5

Priority: 9 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Tactical phase of mission begins Operating in day, VMC flight conditions Risk of bogeys/bandits operating in near proximity exists

Initiating Actions: Begin visual search and scan patterns

Ending Conditions: Tactical phase of mission ends IMC flight conditions are encountered Reaction to observed bogey/bandit is executed

Ending Actions: Stop visual search and scan patterns

KNOWLEDGE

Declarative:

Standard operating procedures, visual scan technique.

Situational:

Mission objectives/requirements, tactical situation, environmental conditions

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables None

Output Interface: None

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that a visual search pattern is being maintained, and that no unobserved bogeys/bandits have been able to engage the formation

Input Interface: Visual environment surrounding aircraft, correlation of other tactical information

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 7 3(b) **Goal:** that visual contact with formation members is maintained **Goal ID:** 7.2 7 3(b) **Source Goal:** 7 2 7 3(b)

Description:
The pilot will use normal visual cues to allow him to monitor and maintain visual contact with other formation members.

Operator: Pilot **Completion Time:** 2

Priority: 9 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Visual contact with formation members is established

Initiating Actions: Visual cues (canopy codes, geographical reference, relative bearing) are used to maintain visual contact.

Ending Conditions: Visual contact with formation members is no longer required or lost

Ending Actions: Visual cues used to maintain visual contact on formation members are disregarded Current mission tasks are performed

KNOWLEDGE

Declarative:

Pattern recognition, visual scan technique

Situational:

Tactical situation, time-of-day, environmental conditions, relative movement

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables None

Output Interface: None

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that visual contact is being maintained on other formation members

Input Interface: Visual environment surrounding aircraft, correlation of other tactical information (radar/visual/air-to-air tacan/Link-16/external agency/communications)

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 7 3(f) **Goal:** that no visually unobserved bogeys/bandits are able to engage the formation at night

Goal ID: 7 2 7 3(f) **Source Goal:** 7 2 7 3(f)

Description:

The pilot will maintain an NVG visual search pattern throughout all phases of a night mission to ensure that no unobserved bogeys/bandits are able to engage his formation without being visually observed

He accomplishes this by developing a scanning pattern that allows him to scan all of the airspace around his aircraft in a deliberate, sequential fashion For example, he may start by observing his deep six o'clock position, then scan out the left side of the canopy until arriving at the 12 o'clock position He will repeat the same process on the right side of the aircraft, then search the extreme vertical above and below his aircraft This NVG visual search pattern is then repeated throughout the mission

Operator: Pilot **Completion Time:** 7

Priority: 9 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Tactical phase of mission begins Operating in night, VMC flight conditions Significant prob Of bogeys/bandits operating in near proximity exists

Initiating Actions: Begin visual search and scan patterns with NVGs.

Ending Conditions: Tactical phase of mission ends IMC flight conditions are encountered Reaction to observed bogey/bandit begins

Ending Actions: Stop visual search and scan patterns with NVGs

KNOWLEDGE

Declarative:

NVG operating procedures, standard operating procedures, visual scan technique with NVGs.

Situational:

Mission objectives/requirements, tactical situation, environmental conditions

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables NVG settings, cockpit lighting, exterior aircraft lighting

Output Interface: NVGs

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that an NVG visual search is being maintained, and that no unobserved bogeys/bandits have been able to engage the formation

Input Interface: NVG visible environment surrounding aircraft, correlation of other tactical information

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 2 7 3(g) **Goal:** that visual contact of other formation members will be maintained using NVGs

Goal ID: 7 2 7 3(g) **Source Goal:** 7 2 7 3(g)

Description:
The NVG-equipped pilot will use normal visual cues to allow him to monitor and maintain visual contact with other formation members In addition, he will use the discreet exterior lighting on other formation member's aircraft to facilitate the visual tracking of his formation aircraft

Operator: Pilot **Completion Time:** 7

Priority: 9 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: NVG contact with formation members is established using NVGs

Initiating Actions: Visual cues (canopy codes, geographical reference, relative bearing) are used to maintain NVG contact on formation members

Ending Conditions: NVG contact with formation members is no longer required or is lost

Ending Actions: Visual cues used to maintain NVG contact on formation members are disregarded Current mission tasks performed

KNOWLEDGE

Declarative:

NVG operating procedures, standard operating procedures, visual scan technique with NVGs

Situational:

Mission objectives/requirements, tactical situation, environmental conditions

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables NVG settings, cockpit lighting, exterior aircraft lighting

Output Interface: NVGs

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that NVG contact is being maintained on other formation members

Input Interface: NVG visible environment surrounding aircraft, correlation of other tactical information (radar/visual/air-to-air tacan/Link-16/external agency/communications)

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 2 2(a) **Goal:** that the FAC target description is received and confirmed **Goal ID:** 7 3 2 2(a) **Source Goal:** 7 3 2 2(a)

Description:
The formation lead will normally ensure that the appropriate sensors are slaved to the target coordinates before the target description brief from the FAC begins Once ready for the briefing, the FAC will describe the target to the pilots Referring to the target area displayed on the DDIs, the pilots will confirm that the target described matches the image displayed to them

Operator: Pilot **Completion Time:** 120
Priority: 3 **Allowable Delay (K):** **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 4 Speech Input (primary task)
External Cue: Yes
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Radio contact with FAC established. Within a specified range of the target Sensors have clear LOS target, and are slaved to the target coordinates
Initiating Actions: FAC begins target description brief
Ending Conditions: Following briefing, formation members confirm that the target area displayed on their DDI matches the target area they have b
Ending Actions: Update target designations using HOTAS Complete air-to-ground checks Prepare for weapons delivery

KNOWLEDGE

Declarative:
Aircraft operating procedures, standard operating procedures, CAS specific procedures and tactics, standard communications format, anticipation of IR/radar image of target and target area

Situational:
Significant features in target area, target specifics, relative sizes/distances between target and surrounding objects, terrain, environmental conditions

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

External Influenced Variables secure radio transmission using Have Quick II, observe sensor imagery displayed on DDIs, maps of target area

Output Interface: COMM 1/2, Have Quick II, HOTAS, DDIs, APG-73, AMIRS, LINK-16, EGI

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 4 Auditory localisation
Kinesthetic: 0 None
Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 4 Spatial encoding
Kinesthetic: 0 None
Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the target description has been received and understood from the FAC, and confirmed via the use of on board sensor imagery

Input Interface: Comparison of target description with target plot on maps, image of target displayed by on board systems, significant features in the target area, unique identifying target features

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7.3 2 2(b) **Goal:** that the target is accurately and correctly identified using aircraft sensors

Goal ID: 7 3 2 2(b) **Source Goal:** 7 3 2 2(b)

Description:

The primary sensors for target detection in the CF-18 are the radar and the AMIRS The radar is used to find targets that are very radar reflective and/or when the weather conditions do not allow the AMIRS to provide an infrared image of the target In nearly all other cases the AMIRS will be the sensor of choice for finding the target

Prior to arriving in the target area, the pilot ensures that the target coordinates are entered correctly into the aircraft database He also confirms the accuracy of his EGI system, and updates the system to improve navigation accuracy, if necessary

Operator: Pilot **Completion Time:** 120

Priority: 3 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Inside a specific range from target Target is within LOS of sensors Sensor parameters verified and set

Initiating Actions: NAV Designate target coordinates and slave appropriate sensor to the target designation

Ending Conditions: Target is acquired

Ending Actions: Pilot communicates with FAC that he has acquired target, and begins to manoeuver to weapons release parameters

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, sensor displays/controls, tactics, anticipation of target representation on display for conditions of the day

Situational:

General target area features, target specifics, range/bearing to the target, environmental conditions, confirming target ID with maps/imagery, IR/radar significant features in target area

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Radar/AMIRS parameters and settings, DDI brightness/contrast, HOTAS

Output Interface: HOTAS, DDIs, HSD, HUD, APG-73, AMIRS, LINK-16, EGI

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Internal Influenced Variables Belief that the target has been located and positively identified using on board sensors

Input Interface: Comparison of target displayed with target plot on maps, imagery, anticipated target representation, unique identifying target features

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 2 2(d) **Goal:** that it is clearly communicated that the target has been acquired **Goal ID:** 7 3 2 2(d) **Source Goal:** 7 3 2 2(d)

Description:
The pilot communicates that he has acquired the target using secure voice on Have Quick II and/or via Link 16

Operator: Pilot **Completion Time:** 10
Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)**
Interruptable: Yes **Sheddable:** No
Resumable: Yes **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 5 Voice Output
External Cue: No
Cognitive Category: 3 Verbal encoding, decoding, speech production, listening
Initiating Conditions: Target has been acquired
Initiating Actions: Begin transmitting to the FAC using Have Quick II
Ending Conditions: Communication with the FAC is complete FAC is confident the proper target has been acquired
Ending Actions: Begin manoeuvering to weapons release parameters

KNOWLEDGE

Declarative:
Aircraft operating procedures, standard operating procedures, standard communications format.

Situational:
Tactical situation, quality/security of communications

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

External Influenced Variables HOTAS, radio transmission on COMM 1/2
Output Interface: COMM 1/2, HOTAS, Have Quick II

INPUT/SENSATION

Vision: 0 None
Audition: 5 Speech input (attended to, salient to the primary task)
Kinesthetic: 1 1 Simple stimulus
Memory: 2 1 Accessible, familiar

COGNITIVE/PERCEPTUAL PROCESS

Vision: 0 None
Audition: 5 Verbal decoding, speech recognition
Kinesthetic: 1 Automatised, highly learned perception
Memory: 1 Automatised

Internal Influenced Variables Belief that it has been clearly communicated clearly to the FAC, that the target has been acquired, using Have Quick II/Link 16
Input Interface: FAC's acknowledgement of communication that the target has been acquired

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 2 2(e) **Goal:** that the FAC receives a target and target area description from the pilot(s)

Goal ID: 7 3 2 2(e) **Source Goal:** 7 3 2 2(e)

Description:

The pilot describes the target area and target to the FAC using Have Quick II The description normally begins with an overview of where, from the pilot's perspective, the tarot lies relative large geographic features nearby The use of cardinal headings is used when describing objects location relative one another in order to avoid confusion The pilot then gives a detailed description of the target's appearance, location, and any unique identifying traits that give the FAC confidence the pilot has acquired the correct target The FAC and pilot, still using have Quick II, will normally confirm a few more details as a final confirmation that the proper target is about to be attacked

Operator: Pilot **Completion Time:** 60

Priority: 3 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 4 Speech Input (primary task)

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Target/target area is displayed on the DDI Target has been acquired

Initiating Actions: Begin transmitting to the FAC using Have Quick II

Ending Conditions: Target/target area description is complete FAC is confident the pilot has acquired the proper target

Ending Actions: Begin to manoeuver to weapons release parameters

KNOWLEDGE

Declarative:

Standard operating procedures, standard communications format, sensor displayed target information

Situational:

Target specifics and description, target area layout, location of target relative other significant objects in target area, environmental conditions, tactical situation, quality/security of communications

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output

Psychomotor: 0 None

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production

Psychomotor: 0 None

Memory: 5 Memorization

External Influenced Variables COMM 1/2 controls and/or Link 16, imagery displayed on DDIs by on board sensors

Output Interface: COMM 1/2, HOTAS, Have Quick II, DDIs, HSD, EGI, AMIRs

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Internal Influenced Variables Belief that the target area and the target have been accurately described to the FAC using Have Quick II, and that the correct target is about to be attacked

Input Interface: Target area/target match target plot on maps, target description from FAC FAC is satisfied the correct target has been designated All formation members agree that the correct t

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 2 2(h) **Goal:** that the target is visually acquired using NVGs **Goal ID:** 7 3 2 2(h) **Source Goal:** 7 3 2 2(h)

Description:
Prior to arriving in the target area, the pilot ensures that the target coordinates are entered correctly into the aircraft database He also confirms the accuracy of his EGI system, and performs an update to improve navigation accuracy, if necessary

The NVG equipped pilot will find his target in much the same way a pilot finds his target visually during the daytime This will involve performing some form of dive manoeuvre in order to visually acquire the target using his NVGs at night Prior to performing the dive attack, the pilot normally nav designates the target He then offsets the target to either the left or right and then, at a pre-calculated distance/altitude/speed, he executes the dive manoeuvre

Operator: Pilot **Completion Time:** 60
Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: VMC night conditions present Within visual range/LOS of target NVGs properly donned and adjusted

Initiating Actions: Begin visual search of target area
Ending Conditions: Target is acquired using NVGs
Ending Actions: Update target designation and communicate the target has been acquired to the FAC using Have Quick II.

KNOWLEDGE

Declarative:
NVG search pattern technique, pattern recognition, key features to find ground patterns visually

Situational:
Significant features in target area that help positively ID target, unique target features, target area environmental conditions and light conditions

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

External Influenced Variables NVG settings, cockpit lighting, exterior aircraft lighting
Output Interface: NVGs, EGI

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 0 None
Memory: 5 Recall

Internal Influenced Variables Belief that the target has been located and positively identified using NVGs
Input Interface: area surrounding target, target specifics, target layout

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 3 1(o) **Goal:** that the area surrounding the target and the target are found visually **Goal ID:** 7 3 3 1(o) **Source Goal:** 7 2 2 1(o)

Description:
Anticipate what the target surrounding area look like by reviewing the target photos, Maps or data linked imagery visually or mentally. When reviewing the target, recognize how your run-in ground track will bring you into and over the target
Look out and search for large features that help you to identify smaller features that lead your eyes to the Target Find DMPI

Operator: Pilot **Completion Time:** 4
Priority: 3 **Allowable Delay (K):** **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)
Initiating Conditions: Specific range from the target, within line of sight, during pull up manoeuvre
Initiating Actions: Conduct visual search pattern
Ending Conditions: Target has been located
Ending Actions: Monitor Target position for Identification

KNOWLEDGE

Declarative:
Visual search pattern technique Pattern recognition, key features to find ground patterns visually

Situational:
Specific Target surrounding features (e g terrain, large features surrounding Target, smaller unique target features, weather, etc)

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)
External Influenced Variables None
Output Interface: None

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 3 Spatially coded
Internal Influenced Variables Belief that Target has been located
Input Interface: Surrounding Ground and target features

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 3 2(b) **Goal:** that the target is designated and that the steering information is available and displayed

Goal ID: 7 3 3 2(b) **Source Goal:** 7 2 2 2(b)

Description:
First NAV designate the Target position (or Offset aim point) With the TDC assigned to the desired display (Radar or the AMIRS), the designation is then adjusted by moving the TD diamond or the NAV stabilized cursor designation When satisfied that the designation is accurately on the Target (or Offset point) add O/S if required (Pre-programmed) by depressing the appropriate push button on the HSD Confirm that the Target Wypt, distance and heading are displayed in the HUD and that they are accurate

Operator: Pilot **Completion Time:** 25

Priority: 4 **Allowable Delay (K):** 1.6 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Desired Range from the target

Initiating Actions: Nav designate the target

Ending Conditions: Target designation symbology is on the desired location for target area identification

Ending Actions: Keep target designation on the desired aim point

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics. Standard Operating procedures. Designation procedures Sensor displays and symbology interpretation

Situational:

General target Area features Range and distance from target.

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables Target designation symbology

Output Interface: DDI,HUD

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the target designation symbology displayed is on the desired location

Input Interface: Sensor display on DDI

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 3 2(c) **Goal:** that the target area is identified with Aircraft Sensors **Goal ID:** 7 3 3 2(c) **Source Goal:** 7 2 2 2(c)

Description:
Anticipate what the target surrounding area look like by reviewing the target photos, Maps or data linked imagery visually or mentally. When reviewing the target, recognize how your run-in ground track will bring you into and over the target Visually look at the displayed target Area picture and search for large features that help you to identify smaller features Identify target Area

Operator: Pilot **Completion Time:** 10
Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)**
Interruptable: Yes **Sheddable:** No
Resumable: No **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Target has been designated, at the calculated range where magnification provides enough details for area ID

Initiating Actions: Look at target area on DDI
Ending Conditions: Target Area has been identified
Ending Actions: Monitor displayed target Area for target Identification

KNOWLEDGE

Declarative:
Aircraft operating procedures Tactics Standard Operating procedures Sensor displays and symbology interpretation

Situational:
Specific target area features (e.g. terrain, large features surrounding target, weather, etc)

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 0 None
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables None
Output Interface: DDI

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 0 None
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 3 Spatially coded

Internal Influenced Variables Belief that the Area displayed on the DDI corresponds to the desired target surroundings
Input Interface: DDI

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 3 2(d) **Goal:** that the aircraft is in the desired position to release weapons **Goal ID:** 7 3 3 2(d) **Source Goal:** 7 2 2 1(d)

Description:
Conduct attack type desired to get to optimal delivery parameters Level Attack, Curvilinear Attack, Pop Up Attack, Curvi Pop Attack, and Loft/Toss
The pull up is generally done by applying 3 G, smoothly and rapidly raising the nose to the desired climb angle Adjust Power to achieve and maintain the desired IAS/TAS Anticipate the turn-in point and roll-in to the desired Dive angle by placing the Lift vector on the AOD (AIM Off Distance) Three G is normally used through the turn Anticipate Velocity vector approaching the AOD, and conduct an unloaded roll to wings level at the desired dive angle
Adjust Power to achieve and maintain the desired IAS/TAS Adjust dive angle to the desired delivery angle and

Operator: Pilot **Completion Time:** 30
Priority: 3 **Allowable Delay (K):** **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Designated distance/time from the target
Initiating Actions: Manoeuver aircraft towards a weapons release solution
Ending Conditions: Aircraft has achieved Weapons Delivery Parameters
Ending Actions: Maintain stable platform for weapons release

KNOWLEDGE

Declarative:
Aircraft operating procedures Tactics Standard Operating procedures Applicable orders, regulations and plans

Situational:
Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Details of on-going or planned activities

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g
Output Interface: Aircraft controls and throttles, HUD

INPUT/SENSATION

Vision: 2 Peripheral
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 5 Recall

Internal Influenced Variables Belief that the aircraft displayed parameters have achieved desired Weapons release parameters
Input Interface: HUD, Relative position to surrounding ground/terrain

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 3 2(e) **Goal:** that the target is identified

Goal ID: 7 3 3 2(e) **Source Goal:** 7 2 2 2(c)

Description:
Anticipate what the target looks like by reviewing the target photos, Maps or data linked imagery visually or mentally When reviewing the target, recognize what the target image should look like on the displays. Adjust Sensors information displayed to optimize target resolution and recognition features Visually look at the target picture displayed on the Sensors tactical displays and search for large features that help you to identify smaller features Identify target

Operator: Pilot **Completion Time:** 10

Priority: 4 **Allowable Delay (K):** 1 3 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Target area has been identified on the Sensor display, at the calculated range where magnification provides enough details for target ID

Initiating Actions: Look at the target image on the DDI

Ending Conditions: Target is positively Identified

Ending Actions: Monitor target features to further confirm ID

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Anticipation of target representation on display for conditions of the day Interpretation of Map/Imagery/Onboard Sensors and symbology/LINK 16

Situational:

Specific target features (e g terrain, large features surrounding target, smaller unique target features, weather, etc) Target IR picture Surrounding IR picture Target Radar Picture Surrounding Radar picture

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables None

Output Interface: DDI, Maps, Photos

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the target displayed corresponds to the assigned target for attack

Input Interface: DDI, Maps Photos

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 3 2(f) **Goal:** that the weapons solution is validated for weapons release **Goal ID:** 7 3 3 2(f) **Source Goal:** 7 2 2 1(g)

Description:
Confirm visually on the HUD that all required delivery parameters have been attained for release Ensure that the proper weapon is selected and that the TDC is assigned to the appropriate display for delivery Confirm visually on the HUD that the Master ARM is in the ARM position Visually confirm that the desired release symbology is displayed and is valid for release Confirm that the displayed aim point is on the DMPI (Desired Mean Point of Impact)

Operator: Pilot **Completion Time:** 2
Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Aircraft has achieved weapons release parameters and point of release is approaching
Initiating Actions: Visually confirm weapon solution
Ending Conditions: Weapons solution has been validated
Ending Actions: Monitor weapons solution

KNOWLEDGE

Declarative:
Aircraft operating procedures Tactics Standard Operating procedures Weapons operating procedures

Situational:
Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Type of weapons delivered

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 0 None
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Weapons release symbology
Output Interface: HUD and Master Arm switch

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 0 None
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 4 Semantically coded

Internal Influenced Variables Belief that the weapons solution displayed is valid for weapons release
Input Interface: HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 3 2(g) **Goal:** that the PGM weapons are delivered **Goal ID:** 7 3 3 2(g) **Source Goal:** 7 2 2 2(g)

Description:
Depress and hold the weapons release button (Pickle button) on the stick Confirm that the PGM weapons are being released Once all weapons have been released, release Pickle button Confirm weapons release on the SMS page on the DDI

Operator: Pilot **Completion Time:** 5
Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)
Initiating Conditions: Weapons solution validated and at the release altitude and or range
Initiating Actions: Monitor displayed release symbology
Ending Conditions: Weapons have been released
Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:
Aircraft operating procedures Tactics Standard Operating procedures Weapons operating procedures

Situational:
Type of weapon released, weather conditions, visibility, winds, sun, terrain, target type

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

External Influenced Variables Weapon release from aircraft , Pickle button depression, Weapons release symbology
Output Interface: HUD, DDI, HOTAS, Pickle button

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 1 Tone or simple auditory signal
Kinesthetic: 1 1 Simple stimulus
Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 1 Automatised, highly learned perception
Kinesthetic: 1 Automatised, highly learned perception
Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the weapons have been delivered and that the symbology displays that fact
Input Interface: HUD, DDI, Aircraft movement at weapons release,

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 3 2(h) **Goal:** that the self-lasing LGB delivery is conducted safely and effectively **Goal ID:** 7 3 3 2(h) **Source Goal:** 7 2 2 2(h)

Description:
Once PGM weapon is released, ensure that the Laser is armed and ready to fire For auto delivery, confirm that the laser is being fired at the target at the appropriate times. Monitor LGB impact
For continuous lasing delivery, enable the trigger option by depressing the appropriate pushbutton on the AMIRS display Fire the laser manually after bomb release by depressing the trigger on the control stick Monitor LGB impact Once weapon has impacted the target, release the trigger

Operator: Pilot **Completion Time:**
Priority: 2 **Allowable Delay (K):** 1 1 **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Weapons delivery parameters have been satisfied
Initiating Actions: Weapons are released
Ending Conditions: Weapons delivery is completed.
Ending Actions: Stop attending to task

KNOWLEDGE

Declarative:
Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, target/target area information, weaponeering information

Situational:
weather conditions, visibility, winds, sun, terrain, target type

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 3 Complex and or unfamiliar
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 5 Memorization/recall, calculation, estimation, deduction, reasoning
Memory: 5 Memorization

External Influenced Variables AMIRS designation Laser code Weapons release parameters Attack axis
Output Interface: HOTAS HUD AMIRS/Laser controls/displays

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the self-lasing LGB delivery has been effectively conducted
Input Interface: AMIRS display, visual/NVG cues

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 3 2(j) **Goal:** that the target designation symbology is on the desired target aim point **Goal ID:** 7 3 3 2(j) **Source Goal:** 7 2 2 2(j)

Description:
Adjust and update target designation on the desired aim point by moving the TDC If required, turn the aircraft to the right to ensure constant field of view to the target

Operator: Pilot **Completion Time:** 40
Priority: 3 **Allowable Delay (K):** **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)
Initiating Conditions: Target designation has move off the desired Aim point, or LGB has been released and is guiding to target
Initiating Actions: Depress and move the TDC
Ending Conditions: Designation has been kept on the desired aim point and/or weapons impact
Ending Actions: Monitor target designation

KNOWLEDGE

Declarative:
Aircraft operating procedures Tactics Standard Operating procedures Designation procedures Sensor displays and symbology interpretation

Situational:
Specific target area features (e g terrain, large features surrounding target, weather, etc), type of attack, type of weapon delivered

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)
External Influenced Variables Target designation symbology
Output Interface: HUD, DDI

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 4 Semantically coded
Internal Influenced Variables Belief that the designation is on the desired target aim point
Input Interface: DDI

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 3 2(k) **Goal:** that the Aircraft is recovered safely and misses the ground by the desired altitude

Goal ID: 7 3 3 2(k) **Source Goal:** 7 2 2 1(1)

Description:

At the appropriate recovery altitude or when pull-up cue / breakaway X is displayed in the HUD, the pilot must achieve a 4-G pull-up manoeuvre within 1.5 seconds and hold the 4-G throughout the pullout until desired climb angle is achieved to meet the clearance criteria Adjust throttles to achieved and maintain desired recovery airspeed Cross check Baro or Radar altitude during recovery to ensure minimum altitude is not broken Increase G if required

Operator: Pilot **Completion Time:** 15

Priority: 1 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Weapons release is completed and/or aircraft at minimum recovery altitude, whichever comes first

Initiating Actions: Safe escape dive recovery initiated by pull up manoeuvre

Ending Conditions: Aircraft is at a safe altitude from the ground in the desired climbing attitude

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Recovery/pull up symbology

Situational:

Minimum recovery altitude, terrain, slope, weather, visibility

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles HUD, Safe escape auditory signals

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 1 1 Simple stimulus

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the desired safe escape attitude and the altitude above ground are achieved

Input Interface: HUD, Relation to the ground, Safe escape auditory signals

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 3 2(l) **Goal:** that BDA is conducted

Goal ID: 7 3 3 2(l) **Source Goal:** 7 2 2 1(k)

Description:
After ensuring that Aircraft is safely recovered from delivery, if desired the target BDA can be conducted by assessing Bomb impact point and damage resulting from hit Visually assess the AMIRS display

Operator: Pilot **Completion Time:** 5

Priority: 8 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: Yes **Sheddable:** Yes

Resumable: No **Shed If Late:** No

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Aircraft is safely recovered from attack and weapon has impacted the target

Initiating Actions: Look at DDI

Ending Conditions: Target BDA is complete

Ending Actions: Memorize target BDA

KNOWLEDGE

Declarative:

Assessment of target battle damage on IR display Weapons effects

Situational:

Target type and size, Weapons type, Weapons impact angle, weather, distance, AMIRS magnification

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 0 None

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables None

Output Interface: DDI, AMIRS display

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 0 None

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

Internal Influenced Variables Belief that the target battle damage has been assessed

Input Interface: DDI, AMIRS display

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 4 1(b) **Goal:** that the pilot confirms the position of the formation by visually referencing his Link 16 display on the HSD

Goal ID: 7 3 4 1(b) **Source Goal:** 7 1 1 3(d)

Description:
Adjust and/or confirm LINK 16/MIDS Tactical Display parameters to ensure the desired airspace is covered Reduce range scale to ensure clarity of displayed information Observe picture being built on the LINK 16/MIDS Tactical Display Visually confirm position of Formation members by analyzing displayed information Mentally build formation position and situational awareness

Operator: Pilot **Completion Time:**

Priority: 4 **Allowable Delay (K):** 1 75 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Tactical phase of mission begins

Initiating Actions: Visually reference Link 16 tactical display on HSD

Ending Conditions: Tactical phase of mission ends

Ending Actions: Stop visually referencing Link 16 tactical display on HSD

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, Link 16 displays/controls

Situational:

Tactical situation, phase of mission, mission objectives/requirements, correlation of displayed information with information displayed from other sources

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables HSD settings/controls Link 16 settings/controls

Output Interface: HOTAS HSD Link-16

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the formation position has been confirmed on Link 16 tactical display

Input Interface: HSD, Link 16 Display/Controls

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 4 1(c) **Goal:** that the post-attack formation join-up is completed safely and expeditiously

Goal ID: 7 3 4 1(c) **Source Goal:** 7 1 1 3(c)

Description:

Formation Join-up is performed by using a combination of a visual overtake and cut-off angle
The cut-off angle is maintained by varying bank angle as the aircraft is moving up the reference line The geometry of the rejoin is such that an increase in speed will require a decrease in bank to maintain the cut-off angle and vice versa Radar lock-on may be used to assist The Vc is monitored on the HUD and represent your true closure (both longitudinal and lateral)
Establish a crosscheck between speed, bank angle and the reference line The closure is then reduced as the desired formation position is attained
To rejoin in close formation, the aircraft is moved to one side about 2-3 aircraft widths and about 50 feet low 50 to

Operator: Pilot **Completion Time:**

Priority: 3 **Allowable Delay (K):** 1 5 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Individual attacks have been completed Formation join-up is required

Initiating Actions: Formation members begin to manoeuver IAW the pre-planned join-up procedure

Ending Conditions: Desired tactical formation is established

Ending Actions: Desired tactical formation is maintained

KNOWLEDGE

Declarative:

Standard operating procedures, aircraft controls and throttles, mission briefing

Situational:

Environmental conditions, relative formation following attack phase, surface-to-air and air-to-air threats in near proximity, timing/routing constaints

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 3 Complex and or unfamiliar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 5 Memorization/recall, calculation, estimation, deduction, reasoning

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Radar/AMIRS parameters

Output Interface: Aircraft controls and throttles HUD Sensor displays

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 1 2 Complex stimulus

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 4 Spatial encoding

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the formation join-up has been conducted

Input Interface: Visual cues Sensor information (AMIRS/Radar) Link 16

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 4 1(e) **Goal:** that visual contact with other formation members is established using NVGs

Goal ID: 7 3 4 1(e) **Source Goal:** 7 1 1 2(h)

Description:
From SA built with Aircraft sensors and LINK 16/MIDS, look in the estimated bearing and range of the mission elements Start a visual search pattern at the estimated location of the contacts Find mission elements visually with NVG

Operator: Pilot **Completion Time:**

Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)**

Interruptable: **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Tactical phase of mission begins Night, VMC flight conditions NVG contact with other formation members is required

Initiating Actions: Visual cues and other sensor information (Link 16/AMIRS/Radar) are used to begin NVG search for other formation member

Ending Conditions: NVG contact with other formation members is established

Ending Actions: Tactical phase of mission ends Day and/or IMC flight conditions occur NVG contact with other formation members no longer required

KNOWLEDGE

Declarative:

Visual/NVG scan techniques, standard operating procedures, NVG operating procedures

Situational:

Environmental conditions, tactical situation, mission objectives/requirements

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables None

Output Interface: NVGs

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that NVG contact has been established with other formation members

Input Interface: NVG visual cues

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7.3 4 2(f) **Goal:** that the formation successfully adjusts to medium/high altitude during the egress

Goal ID: 7 3 4 2(f) **Source Goal:** 7 2 1 1(c)

Description:
Establish in a climb/descent while maintaining required ground speed Cross check altitude by visually confirming Barometric Altitude in the HUD Level Off at the desired altitude Cross check that the chosen altitude is at least 1000' above or below TLs

Operator: Pilot **Completion Time:**

Priority: 6 **Allowable Delay (K):** 1.5 **Difficulty (D)** 0 1

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Egress phase of mission at at medium/high altitude is established.

Initiating Actions: Desired tactical formation is maintained

Ending Conditions: Egress phase of mission ends

Ending Actions: Descent to lower altitude begins

KNOWLEDGE

Declarative:

Aircraft operating instructions, standard operating procedures, tactics, formation keeping procedures

Situational:

Tactical scenario, mission objectives/requirements, environmental conditions

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles HUD

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 1 2 Complex stimulus

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 4 Spatial encoding

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the formation has been established in the medium/high altitude environment

Input Interface: Aircraft altitude/speed Visual cues Sensor information (AMIRS/Radar) Link 16

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 6 1(a) **Goal:** that the tactical roles are established in the formation **Goal ID:** 7 3 6 1(a) **Source Goal:** 7 2 5 1(a)

Description:
Individual responsibilities in addition to lookout are

Lead terrain avoidance, navigation, tactical control of the formation, mission leader and bombs on target,

Number three terrain avoidance, back-up navigation, element position keeping, tactical control of number four, deputy mission and tactical lead and bombs on target,

Wingmen terrain avoidance, position keeping, lookout, bombs on target and monitor sensors

Operator: Pilot **Completion Time:** 999

Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 4

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Ingress is initiated

Initiating Actions: Attend to individual responsibilities

Ending Conditions: Tactical roles have been established.

Ending Actions: Continue attending to individual responsibilities

KNOWLEDGE

Declarative:

Tactics Standard Operating procedures Applicable orders, regulations and plans Formation responsibilities

Situational:

Position in the formation, threat, mission

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Formation position on Displays

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Radios

INPUT/SENSATION

Vision: 2 Peripheral

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Internal Influenced Variables Belief that the tactical roles have been established

Input Interface: Aircraft displays (HUD,DDI,HSD) Radios

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 6 1(b) **Goal:** that aircraft control and flight position are maintained **Goal ID:** 7 3 6 1(b) **Source Goal:** 7 2 5 1(b)

Description:
Maintain aircraft control and position by adjusting Power, Aircraft pitch and roll to obtain desired Airspeed and Flight Path. Adjust Flight position by using airspeed or geometry

Operator: Pilot **Completion Time:** 999

Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 2

Interruptable: **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Domestic portion completed, tactical portion initiated

Initiating Actions: Maintain aircraft control

Ending Conditions: Tactical portion of the mission completed

Ending Actions: Maintain aircraft control

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Applicable orders, regulations and plans

Situational:

Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Details of on-going or planned activities

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Formation position on Displays

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD)

INPUT/SENSATION

Vision: 2 Peripheral

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception

Audition: 0 None

Kinesthetic: 0 None

Memory: 5 Recall

Internal Influenced Variables belief that the aircraft is in controlled flight and that the tactical flight position has been achieved

Input Interface: Aircraft displays (HUD,DDI,HSD)

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 6 1(d) **Goal:** that the pilot confirms the position of the formation by visually referencing his Link 16 display on the HSD

Goal ID: 7 3 6 1(d) **Source Goal:** 7 1 1 3(d)

Description:
Adjust and/or confirm LINK 16/MIDS Tactical Display parameters to ensure the desired airspace is covered Reduce range scale to ensure clarity of displayed information Observe picture being built on the LINK 16/MIDS Tactical Display Visually confirm position of Formation members by analyzing displayed information Mentally build formation position and situational awareness

Operator: Pilot **Completion Time:**

Priority: 4 **Allowable Delay (K):** 1 75 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Tactical phase of mission begins

Initiating Actions: Visually reference Link 16 tactical display on HSD

Ending Conditions: Tactical phase of mission ends

Ending Actions: Stop visually referencing Link 16 tactical display on HSD

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, Link 16 displays/controls

Situational:

Tactical situation, phase of mission, mission objectives/requirements, correlation of displayed information with information displayed from other sources

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables HSD settings/controls Link 16 settings/controls

Output Interface: HOTAS HSD Link-16

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the formation position has been confirmed on Link 16 tactical display

Input Interface: HSD, Link 16 Display/Controls

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 6 2(a) **Goal:** that the ideal tactical formation is selected and flown **Goal ID:** 7 3 6 2(a) **Source Goal:** 7 2 5 2(a)

Description:
The lead will select the optimal formation for the tactical situation and direct his formation members to adopt formation
Wingmen will position their aircraft to optimize formation at the desired range and altitude delta from their lead

Operator: Pilot **Completion Time:** 999
Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)** 0 2
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 5 Voice Output
External Cue: No
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)
Initiating Conditions: The overall tactical situation has changed

Initiating Actions: Lead selects and directs new appropriate formation Wingmen initiate manouevers to achieve formation
Ending Conditions: Correct formation is achieved
Ending Actions: Correct formation is maintained

KNOWLEDGE

Declarative:
Tactics Standard Operating procedures Applicable orders, regulations and plans

Situational:
Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc)

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

External Influenced Variables All aircraft's positions, altitudes, attitudes, headings, speeds and g Aircraft's relative positions (formation)
Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD)

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 5 Speech input (attended to, salient to the primary task)
Kinesthetic: 0 None
Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 5 Verbal decoding, speech recognition
Kinesthetic: 0 None
Memory: 3 Spatial decoding

Internal Influenced Variables Lead's belief that present formation is ideal for present tactical situation
Wingman's belief that they are in the correct position as directed by lead

Input Interface: Outside view Radar Link 16/MIDS display (for tactical picture) HUD, DDI

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 6 2(c) **Goal:** that awareness and good positioning is maintained on other formation members and/or formation elements using non visual methods

Goal ID: 7 3 6 2(c) **Source Goal:** 7 2 5 2(c)

Description:
Positional mutual support is maintained by keeping SA on formation members position utilizing sensors and data link Remain within sensor and weapons range to support formation members

Operator: Pilot **Completion Time:** 999

Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)**

Interruptable: **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 2 Speech Input (in background)

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Change in tactical environment with respect to beyond visual range formation members or other elements

Initiating Actions: Sensors and or datalink are checked to build updated tactical awareness of BVR friendlys and manoeuvers are initiated to mai

Ending Conditions: Appropriate tactical BVR formation is achieved

Ending Actions: Appropriate tactical BVR formation is maintained

KNOWLEDGE

Declarative:

Tactics Applicable orders, regulations and plans Standard Operating Procedures Sensor displays and symbology interpretation

Situational:

Mission Plan Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc)

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output

Psychomotor: 0 None

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production

Psychomotor: 0 None

Memory: 5 Memorization

External Influenced Variables None

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Radar AMIRS

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Internal Influenced Variables Perception that all formation elements are in position to give mutual support

Input Interface: Radar AMIRS Link 16/MIDS display (for tactical picture) HUD, DDI

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 6 2(c) **Goal:** that all aspects of a proper NVG visual lookout are conducted, including maintaining NVG visual contact with other formation members

Goal ID: 7 3 6 2(e) **Source Goal:** 7 2 5 2(e)

Description:
Maintain visual mutual support by maintaining sight with NVG of formation members while establishing visual lookout Conduct visual lookout responsibilities

Operator: Pilot **Completion Time:** 999

Priority: 9 **Allowable Delay (K):** 1 4 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 2 Passive monitoring of speech/auditory signals

Initiating Conditions: Night VMC flying conditions in a tactical arena

Initiating Actions: All formation members commence a continuous task-shared and appropriate crosscheck of various external cues using NVG's,

Ending Conditions: Mission ends or IMC conditions are encountered

Ending Actions: New appropriate crosschecks are initiated (I E IMC radar crosscheck)

KNOWLEDGE

Declarative:

NVG Visual lookout technique Night NVG tactical formation flying Standard Operating Procedures

Situational:

Mission Plan Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Weather conditions, visibility, ambient light

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 3 Complex and or unfamiliar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 5 Memorization/recall, calculation, estimation, deduction, reasoning

Memory: 5 Memorization

External Influenced Variables None

Output Interface: Night Vision Goggles Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD)

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Perception that all aspects of NVG visual lookout technique are being completed, and confirmation that all appropriate formation members are NVG visual

Input Interface: Outside view through NVG's, HUD

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 7 1(a) **Goal:** that correct ground track is maintained

Goal ID: 7 3 7 1(a) **Source Goal:** 7 2 6 1(a)

Description:
Accurately follow the Ground Track information displayed in the HSD and HUD Fly on the displayed heading required to the next waypoint Monitor heading, drift, routing and ground track information Make appropriate heading corrections to regain and maintain desired ground track

Operator: Pilot **Completion Time:** 999

Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 2

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Aircraft's track over ground changes, or requires a change

Initiating Actions: HSD and HUD are checked to adjust heading

Ending Conditions: Correct groundtrack is achieved

Ending Actions: Groundtrack is maintained and monitored

KNOWLEDGE

Declarative:

Sensor displays and symbology interpretation Basic navigation techniques

Situational:

Specific route and/or map Winds

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables Aircraft heading

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Perception that the aircrafts groundtrack corresponds to the desired groundtrack

Input Interface: HUD, DDI's, HSD, Map

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 7 1(b) **Goal:** that all aspects of an Air Coordination Order are followed

Goal ID: 7 3 7 1(b) **Source Goal:** 7 2 6 1(b)

Description:
Adhere to Air Coordination Order by accurately following the ACO routing displayed on the HSD Follow ACO Airspeed, Altitude and routing restrictions

Operator: Pilot **Completion Time:** 999

Priority: 3 **Allowable Delay (K):** 1 2 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: An ACO routing or restriction is encountered

Initiating Actions: HSD, Maps, and primary instruments(a/s, alt, etc) are monitored and crosschecked with ACO

Ending Conditions: ACO routing or restriction no longer applies

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Sensor displays and symbology interpretation Applicable orders, regulations and plans Standard Operating procedures

Situational:

Specific ACO Mission Plan

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 0 None

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 0 None

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that formation/aircraft is adhereing to planned ACO restriction

Input Interface: HUD, DDI's, HSD, Map

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3.7 1(c) **Goal:** that correct groundspeed is flown in order to comply with timings

Goal ID: 7 3 7 1(c) **Source Goal:** 7 2 6 1(c)

Description:
Adjust G/S by increasing or decreasing IAS Monitor ETA over waypoint on the HSD and fine tune G/S as required to arrive at required timing

Operator: Pilot **Completion Time:** 10

Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 1

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: A required timing exists in the future

Initiating Actions: Groundspeed is checked and adjusted based on other timings and navigation/HSD information

Ending Conditions: Timing is met

Ending Actions: Groundspeed is adjusted based on the next required timing, or groundspped becomes a nonessential item

KNOWLEDGE

Declarative:

Sensor displays and symbology interpretation Basic navigation techniques

Situational:

Specific route and/or map Mission Plan Winds

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

Internal Influenced Variables Perception that groundspeed is appropriate for next timing

Input Interface: HUD, DDI's, HSD, Map

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 7 1(d) **Goal:** that all Air Coordination Order restricted area's are avoided **Goal ID:** 7 3 7 1(d) **Source Goal:** 7 2 6 1(d)

Description:
Avoid ACO restricted areas by monitoring HSD displayed information and verifying information on the Area MAP

Operator: Pilot **Completion Time:** 999
Priority: 3 **Allowable Delay (K):** 1 25 **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)
Initiating Conditions: An ACO restricted area is encountered

Initiating Actions: HSD and Maps are monitored and crosschecked with ACO
Ending Conditions: ACO restricted area no longer applies
Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:
Sensor displays and symbology interpretation Applicable orders, regulations and plans Standard Operating procedures

Situational:
Specific ACO Mission Plan

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 0 None
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g
Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 0 None
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 3 Spatially coded

Internal Influenced Variables Belief that formation/aircraft is avoiding ACO restricted area
Input Interface: HUD, DDI's, HSD, Map

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 7 2(b) **Goal:** that correct navigation is carried out and confirmed through HSD (sensor) information

Goal ID: 7 3 7 2(b) **Source Goal:** 7 2 6 2(b)

Description:
Select routing on the HSD System navigation in the CF-18 is simply a matter of following the displayed routing information on the HSD

Operator: Pilot **Completion Time:** 10

Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 15

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: General navigation is required

Initiating Actions: HSD is crosschecked with maps

Ending Conditions: Mission ends or more specific navigation aids are required (I E approach aids)

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Sensor displays and symbology interpretation Basic navigation techniques

Situational:

Specific route and/or map Mission Plan

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 0 None

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 0 None

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Perception that sensor information match those expected from map (and/or memory)

Input Interface: HUD, DDI's, HSD, Map

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 7 2(e) **Goal:** that the Time on Target is achieved accuratly through adjustments of aircraft speed and routing

Goal ID: 7 3 7 2(e) **Source Goal:** 7 2 6 2(e)

Description:
Adjust G/S and routing to arrive at target at predetermined TOT.

Operator: Pilot **Completion Time:** 999

Priority: 4 **Allowable Delay (K):** 1 4 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: A "Time on Target" is pending

Initiating Actions: Groundspeed is referenced and adjusted vs HSD TOT information and navigation

Ending Conditions: TOT is achieved

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Sensor displays and symbology interpretation Basic navigation techniques

Situational:

Specific route and/or map Mission Plan

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relatioship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

Internal Influenced Variables Perception that groundspeed and route is appropriate for TOT

Input Interface: Outside view,HUD, DDI, HSD, map

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 7 2(f) **Goal:** that correct navigation is carried out and confirmed through NVG visual ground references

Goal ID: 7 3 7 2(f) **Source Goal:** 7 2 6 2(f)

Description:
Conduct Navigation by visually finding ground references with NVG to verify that the correct routing is followed

Operator: Pilot **Completion Time:** 20

Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 4

Interruptable: Yes **Sheddable:** No

Resumable: No **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Navigation is required in Night/VMC conditions

Initiating Actions: Outside NVG visual cues are crosschecked with maps to ensure correct navigation

Ending Conditions: IMC conditions are encountered or mission ends

Ending Actions: Other navigation techniques(HSD) are used exclusively

KNOWLEDGE

Declarative:

NVG lookout techniques Sensor displays and symbology interpretation Basic navigation techniques

Situational:

Specific route and/or map Mission Plan Weather conditions, visibility, ambient light

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 3 Complex and or unfamiliar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 5 Memorization/recall, calculation, estimation, deduction, reasoning

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Night Vision Goggles Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD) Maps

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Perception that NVG visual ground references match those expected from map (and/or memory)

Input Interface: Outside view through NVG's, HUD, Map

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 7 3(a) **Goal:** that all significent weather is avoided using both visual and sensor cues **Goal ID:** 7 3 7 3(a) **Source Goal:** 7 2 6 3(a)

Description:
Monitor by visually looking outside the cockpit at significant weather build ups Adjust sensors parameter to optimize weather detection and monitor displayed weather on the DDIs Avoid weather by changing routing and flight profile

Operator: Pilot **Completion Time:** 10
Priority: 2 **Allowable Delay (K):** 1 1 **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Significent weather is encountered
Initiating Actions: Outside cues and/or radar is monitored and aircraft is manoeuvered to avoid weather
Ending Conditions: Weather is no longer a factor
Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:
Basic Flying Sensor displays and symbology interpretation

Situational:
Visual Lookout Cues Radar cues Study of weather forecast and actual weather

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g
Output Interface: Radar Aircraft controls and throttles Aircraft displays (HUD,DDI,HSD)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 3 Spatially coded
Internal Influenced Variables Perception that aircraft/formation will avoid significent weather
Input Interface: Outside view, radar display, HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 7 3(b) **Goal:** that all obstacles are avoided

Goal ID: 7 3 7 3(b) **Source Goal:** 7 2 6 3(b)

Description:
Monitor obstacles visually Avoid obstacles by changing routing and flight path

Operator: Pilot **Completion Time:** 999

Priority: 1 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: An obstacle is encountered

Initiating Actions: Manoeuvre to avoid obstacle

Ending Conditions: Obstacle is avoided, or obstacle avoidance no longer becomes a factor (high level)

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Basic Flying

Situational:

Visual Lookout Cues Knowledge of area obstacles (map study) Specific mission plan

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles HUD Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

INPUT/SENSATION

Vision: 2 Peripheral

Audition: 0 None

Kinesthetic: 1 1 Simple stimulus

Memory: 2 1 Accessible, familiar

Internal Influenced Variables Perception that aircraft is not in conflict with an obstacle

Input Interface: Outside view, HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception

Audition: 0 None

Kinesthetic: 1 Automatised, highly learned perception

Memory: 1 Automatised

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 7 3(c) **Goal:** that all terrain is avoided

Goal ID: 7 3 7 3(c) **Source Goal:** 7 2 6 3(c)

Description:
At all times while flying in the low-level environment the primary task is terrain clearance Monitor terrain visually Avoid terrain by changing flight path

Operator: Pilot **Completion Time:** 999

Priority: 1 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Terrain is encountered

Initiating Actions: Manoeuvre to avoid terrain

Ending Conditions: Terrain is avoided or no longer becomes a factor (high level)

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Basic Flying

Situational:

Visual Lookout Cues Knowledge of area terrain (map study) Specific mission plan

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles HUD Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

INPUT/SENSATION

Vision: 2 Peripheral

Audition: 1 Tone or simple auditory signal

Kinesthetic: 1 1 Simple stimulus

Memory: 2 1 Accessible, familiar

Internal Influenced Variables Perception that aircraft is not in conflict with terrain

Input Interface: Outside view, HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception

Audition: 1 Automatised, highly learned perception

Kinesthetic: 1 Automatised, highly learned perception

Memory: 1 Automatised

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 7 3(d) **Goal:** that all other aircraft are avoided

Goal ID: 7 3 7 3(d) **Source Goal:** 7 2 6 3(e)

Description:
Monitor other Aircraft by establishing cross check between visual look out and sensor information displayed on the HUD and DDIs Avoid other Aircraft by changing flight path

Operator: Pilot **Completion Time:** 999

Priority: 1 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 2 Passive monitoring of speech/auditory signals

Initiating Conditions: An aircraft or formation is encountered

Initiating Actions: Manoeuvre to avoid aircraft

Ending Conditions: Aircraft is avoided

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:
Basic Flying

Situational:
Visual Lookout Cues Specific mission plan

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles HUD Maps

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

INPUT/SENSATION

Vision: 2 Peripheral

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 1 1 Simple stimulus

Memory: 2 1 Accessible, familiar

Internal Influenced Variables Perception that aircraft is not in conflict with another aircraft

Input Interface: Outside view, HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 1 Automatised, highly learned perception

Memory: 1 Automatised

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 8 1(a) **Goal:** that the desired radar modes and parameters are set for search and monitored by visually referencing the radar display on the right DDI

Goal ID: 7 3 8 1(a) **Source Goal:** 7 2 7 1(a)

Description:
Confirm that the desired Radar modes and parameters are set for search Monitor radar visually on the DDIs Adjust radar azimuth and elevation search to cover assigned airspace

Operator: Pilot **Completion Time:** 3

Priority: 4 **Allowable Delay (K):** 1 75 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Begin the tactical phase of the mission

Initiating Actions: Pilot observes the radar search parameters on the radar display on the right DDI

Ending Conditions: Tactical phase of the mission ends

Ending Actions: Perform other non-tactical mission tasks

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, radar displays/controls

Situational:

Tactical situation, aircraft altitude/speed, mission objectives/requirements, weather, terrain

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables radar search modes, radar antenna elevation, radar azimuth, other radar parameters

Output Interface: DDI, HOTAS, APG-73

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading

Audition: 0 None

Kinesthetic: 1 1 Simple stimulus

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding

Audition: 0 None

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the assigned radar search parameters have been set and are being monitored and maintained

Input Interface: Radar display on right DDI

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 8 1(g) **Goal:** that the pilot accurately monitors and interprets the tactical Link-16 information displayed on his HSD

Goal ID: 7 3 8 1(g) **Source Goal:** 7 2 7 1(h)

Description:
The pilot will visually reference his HSD to monitor the Link 16 display

Operator: Pilot **Completion Time:** 5

Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Tactical phase of the mission begins Link 16 information is required by the pilot

Initiating Actions: Pilot visually references the Link 16 display on the HSD

Ending Conditions: Link 16 information is no longer required and/or the tactical phase of the mission ends

Ending Actions: Current mission tasks performed Tactical Link 16 information, displayed on the HSD, is no longer monitored

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, Link 16 displays/controls

Situational:

Tactical situation, phase of mission, mission objectives/requirements, correlation of displayed information with information displayed from other sources

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 0 None

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 0 None

Memory: 5 Memorization

External Influenced Variables Link 16 display settings and parameters

Output Interface: HSD, LINK-16

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the tactical situation is being monitored on the Link 16 display, and all relevant tactical information is being interpreted by the pilot

Input Interface: Link 16 display on HSD, correlation of other tactical information (radar/AMIRS/external agencies) with Link 16 displayed information

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 8 2(a) **Goal:** that the assigned AMIRS search parameters are set and monitored by visually referencing the AMIRS display on the left DDI

Goal ID: 7 3 8 2(a) **Source Goal:** 7 2 7 2(a)

Description:
The pilot will set his assigned AMIRS search parameters via HOTAS or manual selection He will monitor and maintain these parameters by visually checking the AMIRS display on the left DDI If they need adjusting, he will accomplish this via HOTAS/manual selection of the AMIRS search parameters on the left DDI

Operator: Pilot **Completion Time:** 2
Priority: 4 **Allowable Delay (K):** 1.75 **Difficulty (D)**
Interruptable: **Sheddable:** No
Resumable: No **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Tactical phase of the mission begins Tactical IR imagery is required by the pilot while operating in day/night VMC conditions

Initiating Actions: TDC assigned to the left DDI Pilot visually checks the current AMIRS search parameters displayed on the left DDI.

Ending Conditions: Tactical phase of mission ends AMIRS information no longer required IMC flight conditions encountered

Ending Actions: TDC re-assigned away from left DDI AMIRS display no longer monitored

KNOWLEDGE

Declarative:
Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, AMIRS displays/controls

Situational:
Tactical situation, aircraft altitude/speed, mission objectives/requirements, atmospheric conditions, terrain, time of day

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

External Influenced Variables AMIR search modes, AMIRS search parameters

Output Interface: DDI, HOTAS, AMIRS

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 3 Spatial decoding

Internal Influenced Variables Belief that the assigned AMIRS search parameters have been set and are being maintained

Input Interface: AMIRS display on the left DDI

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 8 3(f) **Goal:** that no visually unobserved bogeys/bandits are able to engage the formation at night

Goal ID: 7 3 8 3(f) **Source Goal:** 7 2 7 3(f)

Description:

The pilot will maintain an NVG visual search pattern throughout all phases of a night mission to ensure that no unobserved bogeys/bandits are able to engage his formation without being visually observed

He accomplishes this by developing a scanning pattern that allows him to scan all of the airspace around his aircraft in a deliberate, sequential fashion For example, he may start by observing his deep six o'clock position, then scan out the left side of the canopy until arriving at the 12 o'clock position He will repeat the same process on the right side of the aircraft, then search the extreme vertical above and below his aircraft This NVG visual search pattern is then repeated throughout the mission

Operator: Pilot **Completion Time:** 7

Priority: 9 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Tactical phase of mission begins Operating in night, VMC flight conditions Significant prob Of bogeys/bandits operating in near proximity exists

Initiating Actions: Begin visual search and scan patterns with NVGs

Ending Conditions: Tactical phase of mission ends IMC flight conditions are encountered Reaction to observed bogey/bandit begins

Ending Actions: Stop visual search and scan patterns with NVGs

KNOWLEDGE

Declarative:

NVG operating procedures, standard operating procedures, visual scan technique with NVGs

Situational:

Mission objectives/requirements, tactical situation, environmental conditions

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables NVG settings, cockpit lighting, exterior aircraft lighting

Output Interface: NVGs

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that an NVG visual search is being maintained, and that no unobserved bogeys/bandits have been able to engage the formation

Input Interface: NVG visible environment surrounding aircraft, correlation of other tactical information

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 3 8 3(g) **Goal:** that visual contact of other formation members will be maintained using NVGs

Goal ID: 7 3 8 3(g) **Source Goal:** 7 2 7 3(g)

Description:
The NVG-equipped pilot will use normal visual cues to allow him to monitor and maintain visual contact with other formation members In addition, he will use the discreet exterior lighting on other formation member's aircraft to facilitate the visual tracking of his formation aircraft

Operator: Pilot **Completion Time:** 7

Priority: 9 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: NVG contact with formation members is established using NVGs

Initiating Actions: Visual cues (canopy codes, geographical reference, relative bearing) are used to maintain NVG contact on formation members

Ending Conditions: NVG contact with formation members is no longer required or is lost

Ending Actions: Visual cues used to maintain NVG contact on formation members are disregarded Current mission tasks performed

KNOWLEDGE

Declarative:
NVG operating procedures, standard operating procedures, visual scan technique with NVGs

Situational:
Mission objectives/requirements, tactical situation, environmental conditions

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables NVG settings, cockpit lighting, exterior aircraft lighting

Output Interface: NVGs

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Internal Influenced Variables Belief that NVG contact is being maintained on other formation members

Input Interface: NVG visible environment surrounding aircraft, correlation of other tactical information (radar/visual/air-to-air tacan/Link-16/external agency/communications)

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 1 1(a) **Goal:** that all factor groups are targeted by the formation IAW the established radar search, sort, and targetting contract

Goal ID: 7 7 1 1(a) **Source Goal:** 7 5 2 2(a)

Description:

The formation members will scan their assigned radar search volume They will call out all detected targets within their search volume to other formation members via Have Quick II/Link 16 The formation lead will assign targeting responsibilities if multiple groups are present At the roll range, formation members will meld their radars to their assigned group and begin to sort Narrowing down their radar scan volume, and using a different radar mode optimized for sorting multiple contacts (I e TWS), the formation members study their radar display As the radar breaks out the multiple targets in the group, each pilot commands a lock on his target The formation members then call the status of their sort, and then continue the remainder of the intercept as per lead's direction or the mission briefing

Operator: Pilot **Completion Time:**

Priority: 4 **Allowable Delay (K):** 1 25 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Tactical phase of mission begins

Initiating Actions: Assigned radar search and sort parameters are set

Ending Conditions: Tactical phase of mission ends

Ending Actions: Stop attending to task

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics

Situational:

Mission objectives/requirements, tactical situation, environmental conditions, aircraft altitude/speed

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 3 Complex and or unfamiliar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 5 Memorization/recall, calculation, estimation, deduction, reasoning

Memory: 5 Memorization

External Influenced Variables Radar search and track modes, radar antenna elevation, radar azimuth, other radar parameters

Output Interface: HUD HOTAS APG-73 display

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 1 1 Simple stimulus

Memory: 2 4 Semantically coded

Internal Influenced Variables Belief that the radar contract has been properly employed

Input Interface: Radar Link-16

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 1 1(g) **Goal:** that all enemy contacts on the the Link 16 display are acquired **Goal ID:** 7 7 1 1(g) **Source Goal:** 7 5 2 2(g)

Description:
Acquiring enemy contacts on the Link 16 display involves interpreting the link 16 information displayed on the HSD Contacts that have been positively identified as enemy, will normally be colored red This enemy contact information can then be passed from the Link 16 to one of the on-board targeting sensors (I e the AMIRS or Radar), or used to carry-out a visual acquisition of the contacts (employing NVGs if conducting night operations)

Operator: Pilot **Completion Time:**
Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)**
Interruptable: Yes **Sheddable:** No
Resumable: Yes **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)
Initiating Conditions: Tactical phase of mission begins Enemy contacts are displayed on Link 16 display
Initiating Actions: Link 16 display on HSD is visually referenced
Ending Conditions: Tactical phase of mission ends
Ending Actions: Enemy contacts on Link 16 display are no longer a factor/are ignored

KNOWLEDGE

Declarative:
Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures

Situational:
Mission objectives/requirements, tactical situation

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 0 None
Memory: 1 Commit to memory (LTM and STM)
External Influenced Variables None
Output Interface: Link-16 display

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 0 None
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 0 None
Kinesthetic: 0 None
Memory: 2 4 Semantically coded
Internal Influenced Variables Belief that enemy contacts have been acquired on Link 16 display
Input Interface: Link 16

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 0 None
Kinesthetic: 0 None
Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 1 1(m) **Goal:** that all unknown radar contacts are interrogated accurately and in a timely fashion

Goal ID: 7 7 1 1(m) **Source Goal:** 7 2 7 1(g)

Description:
The pilot will slave the IFF to the targets being tracked by the APG 73 Then, using HOTAS, he will command the IFF to interrogate the unknown radar contacts He will monitor the interrogation results on his radar display Once the contacts have been interrogated, he will pass the results of the IFF interrogation via secure voice or Link 16 or both

Operator: Pilot **Completion Time:**

Priority: 3 **Allowable Delay (K):** 1 5 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Radar contact is identified as unknown

Initiating Actions: Initiaitc IFF interrogation of unknown radar contact

Ending Conditions: IFF interrogation complete Unknown radar contact is identified as friend or foe

Ending Actions: Inform others of IFF interrogation results via Link 16

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics

Situational:

Mission objectives/requirements, correlation of IFF information with other tactical information displayed

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables IFF interrogator settings/controls

Output Interface: IFF interrogator

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

Internal Influenced Variables Belief that unknown radar contacts have been interrogated with IFF

Input Interface: Radar Link-16 IFF

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 1 1(n) **Goal:** that Have Quick II secure communications are employed by all formation members in a clear, concise fashion

Goal ID: 7 7 1 1(n) **Source Goal:** 7 4 2 2(b)

Description:
The pilot reports the target via secure voice transmission when using Have Quick II The transmission is sent using Comm 1 or 2 (whichever one is configured for Have Quick II transmission)

Operator: Pilot **Completion Time:**

Priority: 4 **Allowable Delay (K):** 1 5 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 5 Voice Output

External Cue: No

Cognitive Category: 3 Verbal encoding, decoding, speech production, listening

Initiating Conditions: Tactical phase of mission begins Secure voice communications required

Initiating Actions: Have Quick II secure communications initiated

Ending Conditions: Tactical phase of mission ends Secure voice communications not required/possible

Ending Actions: Cease Have Quick II secure communications

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, standard communications format/procedures

Situational:

Mission objectives/requirements, tactical situation, environmental conditions, radio range/lin-of-sight limitations, complex comm jamming encountered

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables COMM 1/2 controls UFC

Output Interface: Have Quick II COMM 1/2

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

Internal Influenced Variables Belief that secure communications have been employed using Have Quick II

Input Interface: COMM 1/2 Have Quick II

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 2 2(b) **Goal:** that chaff is dispensed

Goal ID: 7 7 2 2(b) **Source Goal:** 7 5 2 3(b)

Description:
Chaff is dispensed by selecting the desired program on the ALE-47 controls, and either by activating the canopy panic button or via HOTAS controls

Operator: Pilot **Completion Time:**

Priority: 2 **Allowable Delay (K):** 1 1 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 1 Tone or Simple Auditory Sign

External Cue: No

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Chaff is required

Initiating Actions: Either Chaff HOTAS switch is used or chaff multiple dispense button is depressed

Ending Conditions: Chaff is dispensed

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Mission objectives/priorities, tactical situation, weather, terrain, threat activity and location Intelligence on enemy electronic order of battle,

Situational:

Type of threat

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables Aircraft speed, g Aircraft configuration (chaff/flare bundles)

Output Interface: DEWS ALR 67 (rwr)

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading

Audition: 1 Tone or simple auditory signal

Kinesthetic: 1 1 Simple stimulus

Memory: 2 3 Spatially coded

Internal Influenced Variables A belief that chaff has been succesfully deployed

Input Interface: DEWS ALR 67 (rwr)

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding

Audition: 1 Automatised, highly learned perception

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7.2 2(c) **Goal:** that all correlated radar threats are jammed effectively **Goal ID:** 7 7 2 2(c) **Source Goal:** 7 5 2 3(c)

Description:
The Jammers generally function automatically The pilot can optimize Jammers employment by analyzing their coverage on the Integrated HSD display, ensuring that the intended enemy threats are within the displayed Jammers coverage If the enemy threats are outside the displayed Area, the pilot will manoeuvre the aircraft to place the threats within coverage

Operator: Pilot **Completion Time:**
Priority: 3 **Allowable Delay (K):** **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 1 Tone or Simple Auditory Sign
External Cue: No
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)
Initiating Conditions: Correlated radar threat is deemed a priority sufficient to require jamming
Initiating Actions: Observe jamming is being applied to correlated radar threat
Ending Conditions: Correlated radar threat no longer constitutes a threat suffiecient to warrant jamming
Ending Actions: Observe jamming has ceased

KNOWLEDGE

Declarative:
Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics, enemy tactics, enemy electronic order of battle

Situational:
Mission objectives/requirements, tactical situation, aircraft altitude/flight path/speed, environmental conditions

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 1 Simple
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 1 Automatised, highly learned
Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Jammer controls/settings
Output Interface: Jammer display HSD RWR

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 1 Tone or simple auditory signal
Kinesthetic: 0 None
Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 1 Automatised, highly learned perception
Kinesthetic: 0 None
Memory: 3 Verbal decoding

Internal Influenced Variables Belief that jammers have been effectively employed
Input Interface: RWR Link 16 Enemy radar/missile activity

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 2 3(e) **Goal:** that all air weapons employed by the enemy are negated

Goal ID: 7 7 2 3(e) **Source Goal:** 7 5 2 4(e)

Description:
The pilots will Negate Enemy Air Weapons Employment by manoeuvring and remaining outside enemy air weapons effective range and by employing DEWS

Operator: Pilot **Completion Time:**

Priority: 1 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Enemy air weapon has been detected

Initiating Actions: Manoeuvre the aircraft

Ending Conditions: Enemy air weapon has been defeated

Ending Actions: Continue with visual look out

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics, enemy tactics, enemy order of battle, enemy weapons, effective actions to defeat enemy weapons

Situational:

Aircraft altitude/flight path/speed, environmental conditions Enemy type/range/altitude/position Type of weapon employed

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 3 Complex and or unfamiliar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 5 Memorization/recall, calculation, estimation, deduction, reasoning

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Aircraft counter measures

Output Interface: Aircraft controls and throttles

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 3 Auditory pattern

Kinesthetic: 0 None

Memory: 2 5 Complex operation

Internal Influenced Variables Belief that the missile has been defeated

Input Interface: RWR, enemy missile

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 3 Verbal decoding

Kinesthetic: 0 None

Memory: 5 Recall

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 2 4(c) **Goal:** that the enemy is prevented from using radar guided missiles or that airborne radar guided missiles are defeated

Goal ID: 7 7 2 4(c) **Source Goal:** 7 5 2 5(c)

Description:
The Air-to-Air RMD is initially performed by an aggressive manoeuvre into the Notch (at 90 degrees from incoming enemy radar) while employing Chaff Manoeuvre the aircraft downwards to ensure that enemy radar will be looking through ground clutter Update heading to maintain the Notch by assessing DEWS displayed information At the appropriate range, transition into IRMD

Operator: Pilot **Completion Time:**

Priority: 2 **Allowable Delay (K):** 1 1 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 3 Auditory Pattern

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Enemy has launched a missile

Initiating Actions: Manoeuvre the aircraft

Ending Conditions: Enemy is no longer in a Radar missile WEZ

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics, enemy tactics, enemy order of battle, enemy weapons, effective actions to defeat enemy weapons

Situational:

Aircraft altitude/flight path/speed, environmental conditions Enemy type/range/altitude/position Type of weapon employed

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Aircraft counter measures

Output Interface: Aircraft controls and throttles

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 3 Auditory pattern

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 3 Verbal decoding

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Internal Influenced Variables Belief that the enemy aircraft is outside of a radar missile WEZ and that incoming missile has been defeated

Input Interface: RWR, enemy missile

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 2 4(g) **Goal:** that appropriate actions are taken to counter threat displayed on the RWR

Goal ID: 7 7 2 4(g) **Source Goal:** 7 4 2 1(b)

Description:

The primary reference for displayed RWR threat emission information is the HSD When a spike is displayed visually/aurally to the pilot, his reaction will be based on the range and lethality of the spike If he can correlate the spike to a non-lethal threat, his reaction will likely be to continue to remain outside the threat's lethal engagement zone, or to engage and kill the enemy before it has an opportunity to engage his aircraft

If he correlates the spike on his HSD to a threat that poses a lethal threat to his aircraft, the pilot must react defensively He will use a combination of aggressive manoeuvres, chaff/flare, jamming, and deception to try and defeat the enemy radar and/or missiles

Operator: Pilot **Completion Time:**

Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 3 Auditory Pattern

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: RWR threat has been detected

Initiating Actions: Manoeuvre the aircraft

Ending Conditions: Enemy is no longer a threat

Ending Actions: Monitor enemy and RWR

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics, enemy tactics, enemy order of battle, enemy weapons RWR interpretation

Situational:

Enemy type/range/altitude/position Type of weapon employed Information displayed on RWR

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Aircraft counter measures

Output Interface: Aircraft controls and throttles

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 3 Auditory pattern

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 3 Verbal decoding

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the enemy is no longer a threat

Input Interface: RWR,HUD,DDI,HSD

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 3 5(a) **Goal:** that the CF-18 is manoeuvered to a position relative to the enemy where Air-to-Air weapons can be employed

Goal ID: 7 7 3 5(a) **Source Goal:** 7 5 2 7(a)

Description:
While conducting the intercept, the enemy aircraft will transition from one weapons engagement zone to the next As the Aircraft approaches closer and the enemy reacts, a series of Offensive BFM manoeuvres are executed to enter and remain into WEZs

Operator: Pilot **Completion Time:**

Priority: 4 **Allowable Delay (K):** 1 25 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 1 Tone or Simple Auditory Sign

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Enemy aircraft has been detected

Initiating Actions: Manoeuvre the aircraft

Ending Conditions: Aircraft is within WEZ

Ending Actions: Maintain position

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics, enemy tactics, enemy order of battle, enemy weapons Basic Fighter Manoeuvres

Situational:

Aircraft altitude/flight path/speed, environmental conditions Enemy type/range/altitude/position Type of weapon employed

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles HUD

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

Internal Influenced Variables Belief that the aircraft has entered WEZ

Input Interface: HUD, enemy aircraft

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 3 5(b) **Goal:** that the weapons solution is validated for weapons release

Goal ID: 7 7 3 5(b) **Source Goal:** 7 2 2 1(g)

Description:
Confirm visually on the HUD that all required delivery parameters have been attained for release Ensure that the proper weapon is selected and that the TDC is assigned to the appropriate display for delivery Confirm visually on the HUD that the Master ARM is in the ARM position Visually confirm that the desired release symbology is displayed and is valid for release Confirm that the displayed aim point is on the DMPI (Desired Mean Point of Impact)

Operator: Pilot **Completion Time:** 2

Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Aircraft has achieved weapons release parameters and point of release is approaching

Initiating Actions: Visually confirm weapon solution

Ending Conditions: Weapons solution has been validated

Ending Actions: Monitor weapons solution

KNOWLEDGE

Declarative:

Aircraft operating procedures Tactics Standard Operating procedures Weapons operating procedures

Situational:

Mission requirements and objectives Specifics of the tactical situation (e g threat/friendly forces, weather, terrain, etc) Type of weapons delivered

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 0 None

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Weapons release symbology

Output Interface: HUD and Master Arm switch

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 0 None

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

Internal Influenced Variables Belief that the weapons solution displayed is valid for weapons release

Input Interface: HUD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 3 5(c) **Goal:** that Air-to-Air weapons are launched to destroy the enemy

Goal ID: 7 7 3 5(c) **Source Goal:** 7 5 2 7(c)

Description:
Select the desired A/A weapon via HOTAS Ensure that a valid solution is displayed Employ A/A weapons by pressing the trigger on the control stick Monitor weapon fly out and support missile if required

Operator: Pilot **Completion Time:**

Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 1 Tone or Simple Auditory Sign

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Aircraft is within WEZ and weapon solution has been verified

Initiating Actions: Press on the trigger

Ending Conditions: Weapon has been launched

Ending Actions: Monitor weapon fly out

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics

Situational:

Type of weapon employed Aircraft altitude/flight path/speed, environmental conditions Enemy type/range/altitude/position

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Weapon symbology, weapon separation

Output Interface: HUD, HOTAS

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 1 Tone or simple auditory signal

Kinesthetic: 1 1 Simple stimulus

Memory: 2 4 Semantically coded

Internal Influenced Variables belief that the desired weapon has been launched

Input Interface: HUD, DDI

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 1 Automatised, highly learned perception

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 3 5(c) **Goal:** that the engagement is egressed without compromising survival or tactical advantage

Goal ID: 7 7 3 5(e) **Source Goal:** 7 5 2 5(f)

Description:
Once enemy attack has been negated, egress engagement by unloading the aircraft while applying maximum power Employ a series of check turns to visually monitor threat

Operator: Pilot **Completion Time:**

Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Aircraft engaged with enemy

Initiating Actions: Unload g

Ending Conditions: Aircraft is outside enemy WEZ

Ending Actions: Monitor enemy aircraft

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics, enemy tactics, enemy order of battle, enemy weapons Basic Fighter Manoeuvres

Situational:

Aircraft altitude/flight path/speed, environmental conditions Enemy type/range/altitude/position

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g

Output Interface: Aircraft controls and throttles HUD

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Internal Influenced Variables Belief that the aircraft is no longer within immediate danger from the engagement

Input Interface: HUD, enemy aircraft position

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 3 5(g) **Goal:** that the weapons fly out is monitored and assessed for results and/or follow on actions

Description:
Monitor weapon fly out visually and support missile as required Monitor Radar display Follow on with additional weapons if required

Goal ID: 7 7 3 5(g) **Source Goal:** 7 5 2 7(g)

Operator: Pilot **Completion Time:**

Priority: 4 **Allowable Delay (K):** 1 3 **Difficulty (D)**

Interruptable: Yes **Sheddable:** No

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Weapon has been launched

Initiating Actions: Visually monitor displays

Ending Conditions: Weapon has impacted target

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics, enemy tactics, enemy order of battle, enemy weapons

Situational:

Enemy type/range/altitude/position Type of weapon employed.

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 0 None

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables None

Output Interface: HUD,DDI

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 0 None

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

Internal Influenced Variables Belief that the weapon has impacted the target

Input Interface: HUD,DDI,enemy aircraft

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 4 1(a) **Goal:** that a detailed scan of the airspace surrounding the aircraft and the formation is conducted in order to detect enemy SAMs and AAA

Goal ID: 7 7 4 1(a) **Source Goal:** 7 4 2 1(a)

Description:
The pilot conducts a visual lookout by scanning the airspace in a 360 degree pattern around his aircraft The visual lookout provides a final layer of protection against undetected air-to-air or surface-to-air threats or targets that may be trying to engage the pilot's formation of aircraft

Operator: Pilot **Completion Time:**

Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Aircraft has entered enemy territory

Initiating Actions: Start visual scan

Ending Conditions: Airspace has been scanned

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Visual lookout procedures, tactics, enemy tactics, enemy order of battle, enemy weapons

Situational:

Aircraft altitude/flight path/speed, environmental conditions

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables None

Output Interface: None

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

INPUT/SENSATION

Vision: 2 Peripheral

Audition: 0 None

Kinesthetic: 1 1 Simple stimulus

Memory: 2 3 Spatially coded

Internal Influenced Variables Belief that the airspace has been scanned for threats

Input Interface: Surrounding airspace

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception

Audition: 0 None

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 4 1(b) **Goal:** that appropriate actions are taken to counter threat displayed on the RWR

Goal ID: 7 7 4 1(b) **Source Goal:** 7 4 2 1(b)

Description:

The primary reference for displayed RWR threat emission information is the HSD When a spike is displayed visually/aurally to the pilot, his reaction will be based on the range and lethality of the spike If he can correlate the spike to a non-lethal threat, his reaction will likely be to continue to remain outside the threat's lethal engagement zone, or to engage and kill the enemy before it has an opportunity to engage his aircraft

If he correlates the spike on his HSD to a threat that poses a lethal threat to his aircraft, the pilot must react defensively He will use a combination of aggressive manoeuvres, chaff/flare, jamming, and deception to try and defeat the enemy radar and/or missiles

Operator: Pilot **Completion Time:**

Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 3 Auditory Pattern

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: RWR threat has been detected

Initiating Actions: Manoeuvre the aircraft

Ending Conditions: Enemy is no longer a threat

Ending Actions: Monitor enemy and RWR

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics, enemy tactics, enemy order of battle, enemy weapons RWR interpretation

Situational:

Enemy type/range/altitude/position Type of weapon employed Information displayed on RWR

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 *Commit to memory* (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Aircraft counter measures

Output Interface: Aircraft controls and throttles

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 3 Auditory pattern

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

Internal Influenced Variables Belief that the enemy is no longer a threat

Input Interface: RWR,HUD,DDI,HSD

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 3 Verbal decoding

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 4 1(d) **Goal:** that a detailed scan of the airspace surrounding the aircraft and the formation is conducted in order to detect enemy SAMs and AAA

Goal ID: 7 7 4 1(d) **Source Goal:** 7 4 2 1(g)

Description:
The NVG-equipped pilot conducts a visual lookout by scanning the airspace in a 360 degree pattern around his aircraft The visual lookout provides a final layer of protection against undetected air-to-air or surface-to-air threats and targets that may be trying to engage the pilot's formation of aircraft

Operator: Pilot **Completion Time:**

Priority: 7 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: Yes **Sheddable:**

Resumable: Yes **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Aircraft has entered enemy territory

Initiating Actions: Start visual scan

Ending Conditions: Airspace has been scanned

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Visual lookout procedures with NVG, tactics, enemy tactics, enemy order of battle, enemy weapons

Situational:

Aircraft altitude/flight path/speed, environmental conditions

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables None

Output Interface: NVGs

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 0 None

Kinesthetic: 0 None

Memory: 2 3 Spatially coded

Internal Influenced Variables Belief that the airspace has been scanned for threats

Input Interface: NVGs

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 0 None

Kinesthetic: 0 None

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 4 1(e) **Goal:** that the detected threat information is passed to formation members in a clear and concise manner using directive then descriptive commentary

Goal ID: 7 7 4 1(e) **Source Goal:** 7 5 2 2(f)

Description:
The pilot advises formation members and controlling agency on visually acquired threats by voice on Have quick II radio, discreet radio or by Data Link communications If immediate actions are required, the pilot will conduct a Directive then Descriptive commentary of the visually acquired threats If no Immediate action are required, then the pilot uses the standardized description of the visually acquired contacts location and information

Operator: Pilot **Completion Time:**

Priority: 1 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 5 Voice Output

External Cue: No

Cognitive Category: 3 Verbal encoding, decoding, speech production, listening

Initiating Conditions: Threat has been detected

Initiating Actions: Key the appropriate radio

Ending Conditions: Threat information has been passed

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics, enemy tactics, enemy order of battle, enemy weapons Tactical communication procedures

Situational:

Enemy type/range/altitude/position Type of weapon employed

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Radio output

Output Interface: Aircraft controls, radio

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

INPUT/SENSATION

Vision: 0 None

Audition: 5 Speech input (attended to, salient to the primary task)

Kinesthetic: 0 None

Memory: 2 2 Verbally coded

Internal Influenced Variables Belief that the threat information has been passed and received

Input Interface: Radio

COGNITIVE/PERCEPTUAL PROCESS

Vision: 0 None

Audition: 5 Verbal decoding, speech recognition

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 5 1(a) **Goal:** that high speed flight is safely and efficiently conducted **Goal ID:** 7 7 5 1(a) **Source Goal:** 7 7 5 1(a)

Description:
Accomplished by advancing the throttles, usually to at least MIL power or higher, and allowing the aircraft to accelerate along a level to slightly descending flight path Once the desired airspeed is attained, the throttles are adjusted as required to maintain the target speed, and aircraft attitude is adjusted in a conventional manner reference the velocity vector in the HUD As well, during high speed flight, heavy manoeuvering is kept to a minimum to avoid depletion of aircraft energy due to load forces

Operator: Pilot **Completion Time:** 999
Priority: 6 **Allowable Delay (K):** **Difficulty (D)** 0 2
Interruptable: Yes **Sheddable:** No
Resumable: Yes **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Decision is made to conduct high speed flight
Initiating Actions: Advance the throttles Monitor aircraft flight parameters in HUD Properly control aircraft as acceleration occurs and high spe
Ending Conditions: High speed is no longer required or desired
Ending Actions: Reduce throttles Monitor aircraft flight parameters in HUD Properly control aircraft as deceleration to lower speed is achieved

KNOWLEDGE

Declarative:
Aircraft operating instructions, aircraft handling techniques, standard operating procedures, specific orders and regulations

Situational:
Mission requirements/objectives, aircraft altitude, fuel status, environmental conditions, tactical situation

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g
Output Interface: Aircraft controls, Throttles, HUD

INPUT/SENSATION

Vision: 2 Peripheral
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 3 Spatially coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 1 Automatised, highly learned perception
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 3 Spatial decoding

Internal Influenced Variables Belief that high speed flight has been employed safely and efficiently
Input Interface: HUD, throttle and aircraft controls, aircraft flight characteristics

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 5 1(c) **Goal:** that all known threat envelopes are avoided

Goal ID: 7 7 5 1(c) **Source Goal:** 7 7 5 1(c)

Description:
During the mission planning phase all known threat envelopes are plotted reference the mission routing using the most current intelligence reports Formation altitude, routing, and tactics are then decided upon that will ensure that all known threats are avoided to the maximum extent possible Once in-flight, the pilot references his HSD to note his present position, flight path, and the location of all known threat envelopes displayed via MIDS If his flight path will fall inside one of the threat rings depicted on the HSD (normally a red ring or a red 3-D volume of airspace), he manoeuvers laterally and/or vertically to ensure the threat ring will be avoided Aircraft speed may also be adjusted in order to achieve the desired result

Operator: Pilot **Completion Time:** 15

Priority: 3 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Ingress phase of mission, at/beyond FLOT Threat envelopes a factor

Initiating Actions: Monitor position reference known threat envelope locations (using HSD/maps/intelligence)

Ending Conditions: Egress phase of mission, threat envelopes no longer a factor

Ending Actions: Stop monitoring location of known threat envelopes Attend to other current mission tasks

KNOWLEDGE

Declarative:

Standard operating procedures, classified aircraft operating procedures, intelligence on enemy electronic order of battle, tactics

Situational:

Mission objectives/priorities, tactical situation, weather, terrain, threat activity and location

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Observe threat envelopes on HSD, status of DEWs

Output Interface: HSD, LINK-16, EGI, HUD, DEWs, Aircraft Controls, Throttles

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition:

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition:

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Internal Influenced Variables Belief that all significant threat envelopes have been avoided

Input Interface: Link 16 display on HSD, status of DECM suite, correlated tactical information, visual confirmation of lack of missile launches from correlated threats

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 5 1(d) **Goal:** that a mental target area tactical picture is built **Goal ID:** 7 7 5 1(d) **Source Goal:** 7 2 2 1(m)

Description:
Adjust and/or confirm LINK 16/MIDS Tactical Display parameters to ensure the desired airspace in the Target area is covered Observe picture being built on the LINK 16/MIDS Tactical Display Visually confirm position of formation members as well as other Friendly Aircraft, Elements or Sections conducting operation within the target area Monitor Adversary Disposition in the target Area by analyzing displayed information Mentally build general picture and situational awareness

Operator: Pilot **Completion Time:**
Priority: 5 **Allowable Delay (K):** **Difficulty (D)**
Interruptable: **Sheddable:**
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 1 Tone or Simple Auditory Sign
External Cue: No
Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops
Initiating Conditions: Target area is approaching
Initiating Actions: Link 16/MIDS and/or ather sources are crosschecked to confirm target area tactical picture
Ending Conditions: Target is impending and tactical picture is sufficiently built
Ending Actions: Target attack is carried out

KNOWLEDGE

Declarative:
Mission objectives/priorities, tactical situation, weather, terrain, threat activity and location

Situational:
Mission objectives/priorities, tactical situation, weather, terrain, threat activity and location

OUTPUT/BEHAVIOUR

Voice: 1 Voice Output
Psychomotor: 0 None
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables None
Output Interface: DDI Link 16/MIDS Radios

COGNITIVE/PERCEPTUAL PROCESS

Voice: 3 Speech production
Psychomotor: 0 None
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays
Audition: 2 Speech input (incidental to the primary task)
Kinesthetic: 1 1 Simple stimulus
Memory: 2 5 Complex operation
Internal Influenced Variables A belief that the mental target area picture is sufficient
Input Interface: DDI Link 16/MIDS Radios

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition
Audition: 2 Passive (pre-attentive) monitoring of auditory signals
Kinesthetic: 1 Automatised, highly learned perception
Memory: 5 Recall

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 5 2(a) **Goal:** that appropriate actions are taken to counter threat displayed on the RWR

Goal ID: 7 7 5 2(a) **Source Goal:** 7 4 2 1(b)

Description:

The primary reference for displayed RWR threat emission information is the HSD When a spike is displayed visually/aurally to the pilot, his reaction will be based on the range and lethality of the spike If he can correlate the spike to a non-lethal threat, his reaction will likely be to continue to remain outside the threat's lethal engagement zone, or to engage and kill the enemy before it has an opportunity to engage his aircraft

If he correlates the spike on his HSD to a threat that poses a lethal threat to his aircraft, the pilot must react defensively He will use a combination of aggressive manoeuvres, chaff/flare, jamming, and deception to try and defeat the enemy radar and/or missiles

Operator: Pilot **Completion Time:**

Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 3 Auditory Pattern

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: RWR threat has been detected

Initiating Actions: Manoeuvre the aircraft

Ending Conditions: Enemy is no longer a threat

Ending Actions: Monitor enemy and RWR

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics, enemy tactics, enemy order of battle, enemy weapons RWR interpretation

Situational:

Enemy type/range/altitude/position Type of weapon employed Information displayed on RWR

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Aircraft counter measures

Output Interface: Aircraft controls and throttles

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 3 Auditory pattern

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 3 Verbal decoding

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that the enemy is no longer a threat

Input Interface: RWR,HUD,DDI,HSD

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 5 2(b) **Goal:** that all correlated radar threats are jammed effectively

Goal ID: 7 7 5 2(b) **Source Goal:** 7 5 2 3(c)

Description:
The Jammers generally function automatically The pilot can optimize Jammers employment by analyzing their coverage on the Integrated HSD display, ensuring that the intended enemy threats are within the displayed Jammers coverage If the enemy threats are outside the displayed Area, the pilot will manoeuvre the aircraft to place the threats within coverage

Operator: Pilot **Completion Time:**

Priority: 3 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 1 Tone or Simple Auditory Sign

External Cue: No

Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)

Initiating Conditions: Correlated radar threat is deemed a priority sufficient to require jamming

Initiating Actions: Observe jamming is being applied to correlated radar threat

Ending Conditions: Correlated radar threat no longer constitutes a threat suffiecient to warrant jamming

Ending Actions: Observe jamming has ceased

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, tactics, enemy tactics, enemy electronic order of battle

Situational:

Mission objectives/requirements, tactical situation, aircraft altitude/flight path/speed, environmental conditions

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 *Commit to memory (LTM and STM)*

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g Jammer controls/settings

Output Interface: Jammer display HSD RWR

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 1 Tone or simple auditory signal

Kinesthetic: 0 None

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 1 Automatised, highly learned perception

Kinesthetic: 0 None

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that jammers have been effectively employed

Input Interface: RWR Link 16 Enemy radar/missile activity

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 5 2(c) **Goal:** that chaff is dispensed

Goal ID: 7 7 5 2(c) **Source Goal:** 7 5 2 3(b)

Description:
Chaff is dispensed by selecting the desired program on the ALE-47 controls, and either by activating the canopy panic button or via HOTAS controls

Operator: Pilot **Completion Time:**

Priority: 2 **Allowable Delay (K):** 1 1 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 1 Tone or Simple Auditory Sign

External Cue: No

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: Chaff is required

Initiating Actions: Either Chaff HOTAS switch is used or chaff multiple dispense button is depressed

Ending Conditions: Chaff is dispensed

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Mission objectives/priorities, tactical situation, weather, terrain, threat activity and location Intelligence on enemy electronic order of battle,

Situational:

Type of threat

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft speed, g Aircraft configuration (chaff/flare bundles)

Output Interface: DEWS ALR 67 (rwr)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading

Audition: 1 Tone or simple auditory signal

Kinesthetic: 1 1 Simple stimulus

Memory: 2 3 Spatially coded

Internal Influenced Variables A belief that chaff has been succesfully deployed

Input Interface: DEWS ALR 67 (rwr)

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding

Audition: 1 Automatised, highly learned perception

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Spatial decoding

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 5 3(a) **Goal:** that terrain masking is used to avoid enemy radar **Goal ID:** 7 7 5 3(a) **Source Goal:** 7.7 2 1(f)

Description:
If able, aircraft routing is chosen during the mission planning phase to maximize the pilot's ability to exploit the terrain along his route to his advantage. If not, the pilot chooses his flight path visually and then descends his aircraft to low altitude The pilot manoeuvers his aircraft laterally and vertically in order to ensure that the local terrain blocks the line-of-sight between his aircraft and the enemy

Operator: Pilot **Completion Time:**
Priority: 2 **Allowable Delay (K):** 1 2 **Difficulty (D)**
Interruptable: No **Sheddable:** No
Resumable: Not Applicable **Shed If Late:** Not Applicable
Feeds Back to Higher Level Goal No

Auditory Category: 0 None
External Cue: Not Applicable
Cognitive Category: 4 Spatial encoding, decoding, pattern recognition (reading maps, giving directions)
Initiating Conditions: Terrain masking is required to avoid or lose an enemy radar
Initiating Actions: Terrain is placed between enemy radar and aircraft
Ending Conditions: Enemy radar is avoided
Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:
Intelligence on enemy electronic order of battle Classified aircraft operating instructions

Situational:
Type of threat Tactical situation

OUTPUT/BEHAVIOUR

Voice: 0 None
Psychomotor: 1 2 Difficult but familiar
Memory: 1 Commit to memory (LTM and STM)

External Influenced Variables Aircraft position, altitude, attitude, heading, speed and g
Output Interface: Visual lookout ALR 67 (rwr) Link 16/MIDS

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None
Psychomotor: 4 Spatial encoding
Memory: 5 Memorization

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading
Audition: 0 None
Kinesthetic: 1 1 Simple stimulus
Memory: 2 1 Accessible, familiar
Internal Influenced Variables A belief that terrain masking has been succesfully deployed
Input Interface: Visual lookout ALR 67 (rwr) Link 16/MIDS

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding
Audition: 0 None
Kinesthetic: 1 Automatised, highly learned perception
Memory: 1 Automatised

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7.6 1(b) **Goal:** that defensive counter measures are employed in order to maximize effectiveness and ensure survivability

Goal ID: 7 7 6 1(b) **Source Goal:** 7 7 6 1(b)

Description:

As part of his systems check on the ground the pilot ensures that the defensive counter measures suite is loaded and configured properly He then ensures it passes all respective BIT tests on start-up During the fence-in check, the pilot ensures the system is set to AUTO to allow systems such as on-board jammers to function in their normal, automatic mode The HSD and HUD are the primary references for RWR and HSD information for the pilot when he is employing defensive countermeasures Using this displayed information, the pilot will position his aircraft so as to maximize the effectiveness of his RWR and Jammer Conventional defensive counter measures such as heavy manoeuvering, AAMD, IRCM, and the employment of chaff/flare from the ALE-47 will be used as the pilot deems fit to optimize the desired result

Operator: Pilot **Completion Time:** 60

Priority: 2 **Allowable Delay (K):** 1 1 **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 1 Tone or Simple Auditory Sign

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Tactical phase of mission Threat exists significant enough to require the employment of defensive counter measures

Initiating Actions: Determine type/order of defensive countermeasures to be employed(avoidance/manoeuvers/chaff/flare/jamming/terrain maski

Ending Conditions: Threat no longer significant enough to require employment of defensive counter measures and/or tactical phase of mission end

Ending Actions: Stop employing defensive counter measures Resume current mission tasks

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, enemy electronic order of battle, tactics, intelligence reports

Situational:

Mission objectives/priorities, tactical situation, weather, terrain, threat activity and location, stage of mission

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables HOTAS, DEWS, Link-16 display, aircraft position, altitude, attitude, heading, speed and g

Output Interface: HOTAS, HUD, DECM Suite, LINK-16, HSD, Aircraft Controls, Throttles

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 1 Tone or simple auditory signal

Kinesthetic: 1 1 Simple stimulus

Memory: 2 4 Semantically coded

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 1 Automatised, highly learned perception

Kinesthetic: 1 Automatised, highly learned perception

Memory: 3 Verbal decoding

Internal Influenced Variables Belief that defensive countermeasures have been employed to effectively counter all significant threats encountered

Input Interface: status of DEWS suite (ALE-47/jammers/RWR), monitoring of Link-16 display on HSD, status of enemy threats

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 6 3(a) **Goal:** that RMD is properly executed to ensure survivability against surface-to-air threats

Goal ID: 7.7 6 3(a) **Source Goal:** 7.7 6 3(a)

Description:
Using all information available at the time the pilot will try and determine the type/azimuth/range/status of the radar that is illuminating his RWR Assuming the surface-to-air threat is of a critical nature, the pilot will turn aggressively to place the threat radar at his 3 or 9 o'clock position while descending and deploying chaff He will make use of terrain masking if practical He will ensure, using his HSD and HUD, that he maintains the enemy radar signal on his wing line, and that his on-board jammer is working to defeat the host radar and any inbound missiles He will continue to use chaff and begin a visual lookout If missiles are visually sighted and considered a threat, a visual missile defence is executed

Operator: Pilot **Completion Time:** 60

Priority: 1 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 1 Tone or Simple Auditory Sign

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Surface-to-air radar missile launch on formation aircraft is detected using on board systems

Initiating Actions: Visually reference DEWS/tactical information on HSD Decide on priority/type of radar missile defence to be carried out (terr

Ending Conditions: Missile no longer poses a significant threat to aircraft/formation

Ending Actions: Check for follow on missile launches Regain formation mutual support and visual lookout Resume current mission tasks

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, enemy electronic order of battle, tactics, intelligence reports

Situational:

Aircraft altitude/airspeed, aircraft configuration, status of defensive countermeasures, tactical situation, risk of follow on engagement by other enemy threats

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables HOTAS, DEWS status, aircraft position, altitude, attitude, heading, speed and g

Output Interface: HOTAS, HUD, DEWS, LINK-16, RWR, HSD, Aircraft Controls, Throttles

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 1 Tone or simple auditory signal

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 1 Automatised, highly learned perception

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Internal Influenced Variables Belief that surface-to-air RMD has been effectively carried out, and all correlated radar threats have been defeated

Input Interface: Visually confirming that a sufficient miss distance is created prior to missile warhead detonation occurs, lack of aircraft damage

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 6 3(b) **Goal:** that IRMD is properly executed to ensure survivability against surface-to-air threats

Goal ID: 7 7 6 3(b) **Source Goal:** 7 7 6 3(b)

Description:
After sighting the missile launch, the pilot will assess whether or not it poses a threat to him If he determines it does, he will manoeuver hard to place the missile on his wing line As he rolls out of the turn he will reduce his throttles and begin employing IRCM He will also deploy flares from his ALE-47 as per SOPs With approximately 3-5 seconds prior to missile intercept the pilot will carry out a visual 3-D barrel roll manoeuver around the inbound missile and begin deploying flares at a higher rate, in order to ensure a significant miss distance occurs before the missile's warhead detonates

Operator: Pilot **Completion Time:** 60

Priority: 1 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 0 None

External Cue: Not Applicable

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Uncorrelated missile launch is visually sighted with no RWR indications

Initiating Actions: Perform hard turn to place missile on wing line using visual references

Ending Conditions: Missile no longer poses a significant threat to aircraft/formation

Ending Actions: Check for follow on missile launches Regain formation mutual support and visual lookout Resume current mission tasks

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, enemy electronic order of battle, tactics, intelligence reports

Situational:

Aircraft altitude/airspeed, aircraft configuration, status of defensive countermeasures, proximity of missile when sighted, tactical situation, risk of follow on engagement by other enemy threats

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables HOTAS, DEWS (flares), aircraft position, altitude, attitude, heading, speed and g

Output Interface: HOTAS, HUD, ALE-47, LINK-16, Aircraft Controls, Throttles

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 1 Tone or simple auditory signal

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 1 Automatised, highly learned perception

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Internal Influenced Variables Belief that surface-to-air IRMD has been successfully carried out, and all significant IR threats have been defeated

Input Interface: Visually confirming that a sufficient miss distance is created prior to missile warhead detonation occurs, lack of aircraft damage

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 6 3(c) **Goal:** that air to air missle defence is properly executed to ensure survivability against air-to-air threats

Goal ID: 7 7 6 3(c) **Source Goal:** 7 5 2 5(e)

Description:
Employ defensive BFM manoeuvres to negate enemy attack Assess bandit reposition and perform last ditch manoeuvring If unsuccessful, manoeuvre the aircraft into a series of Guns defence and jinks

Operator: Pilot **Completion Time:**

Priority: 1 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: No **Sheddable:** No

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 1 Tone or Simple Auditory Sign

External Cue: No

Cognitive Category: 5 Memorization/recall, calculation, estimation, deduction, reasoning, high level ops

Initiating Conditions: Air-to-air radar missile launch on formation aircraft is detected using on board systems

Initiating Actions: Visually reference DEWS/tactical information on HSD Decide on priority/type of radar missile defence to be carried out (terr

Ending Conditions: Missile no longer poses a significant threat to aircraft

Ending Actions: Check for follow on missile launches Monitor Enemy aircraft Regain formation mutual support and visual lookout Resume current mission tasks

KNOWLEDGE

Declarative:

Aircraft operating procedures, standard operating procedures, classified aircraft operating procedures, enemy electronic order of battle, tactics, intelligence reports

Situational:

Aircraft altitude/airspeed, aircraft configuration, status of defensive countermeasures, tactical situation, risk of follow on engagement by other enemy threats

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 2 Difficult but familiar

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 4 Spatial encoding

Memory: 5 Memorization

External Influenced Variables HOTAS, DEWS status, aircraft position, altitude, attitude, heading, speed and g Enemy aircraft position

Output Interface: HOTAS, HUD, DEWS, LINK-16, RWR, HSD, Aircraft Controls, Throttles

INPUT/SENSATION

Vision: 1 2 Pattern, spatial relationship, tracking, graphic displays

Audition: 1 Tone or simple auditory signal

Kinesthetic: 1 1 Simple stimulus

Memory: 2 5 Complex operation

COGNITIVE/PERCEPTUAL PROCESS

Vision: 4 Spatial encoding, visual pattern recognition

Audition: 1 Automatised, highly learned perception

Kinesthetic: 1 Automatised, highly learned perception

Memory: 5 Recall

Internal Influenced Variables Belief that air-to-air missle has been effectively carried out, and all correlated air to air threats have been defeated

Input Interface: Visually confirming that a sufficient miss distance is created prior to missile warhead detonation occurs, lack of aircraft damage

Annex I - CF18 Air to Ground PCT Goal Analysis Results

IP Number 7 7 6 3(d) **Goal:** that external stores are jettisoned

Goal ID: 7 7 6 3(d) **Source Goal:** 7 7 3 6(1)

Description:
The pilot reaches down with his left hand and presses the Selective Jettison Button to jettison the pre-selected external stores. If a more immediate action is required and the pilot requires to jettison all external stores, he reaches up with his left hand and presses the Emergency Jettison Button to Jettison all external stores

Operator: Pilot **Completion Time:**

Priority: 5 **Allowable Delay (K):** **Difficulty (D)**

Interruptable: **Sheddable:**

Resumable: Not Applicable **Shed If Late:** Not Applicable

Feeds Back to Higher Level Goal No

Auditory Category: 1 Tone or Simple Auditory Sign

External Cue: No

Cognitive Category: 1 Automatized, highly learned (easy to do for a trained person)

Initiating Conditions: External stores jettison is required

Initiating Actions: External Stores Jettison is programmed and button is depressed

Ending Conditions: External Stores are jettisoned

Ending Actions: Stop attending to goal

KNOWLEDGE

Declarative:

Aircraft Operating Instructions

Situational:

Present stores on board Tactical situation

OUTPUT/BEHAVIOUR

Voice: 0 None

Psychomotor: 1 1 Simple

Memory: 1 Commit to memory (LTM and STM)

COGNITIVE/PERCEPTUAL PROCESS

Voice: 0 None

Psychomotor: 1 Automatised, highly learned

Memory: 5 Memorization

External Influenced Variables Aircraft stores configuration Aircraft position, altitude, attitude, heading, speed and g

Output Interface: DDI (stores page) Jettison Panel

INPUT/SENSATION

Vision: 1 1 Text, Dial Reading

Audition: 0 None

Kinesthetic: 1 1 Simple stimulus

Memory: 2 1 Accessible, familiar

COGNITIVE/PERCEPTUAL PROCESS

Vision: 3 Verbal encoding

Audition: 0 None

Kinesthetic: 1 Automatised, highly learned perception

Memory: 1 Automatised

Internal Influenced Variables Belief that stores have been jettisoned

Input Interface: DDI (stores page) Jettison Panel

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14 ABSTRACT

(U) The Directorate of Aerospace Requirements (DAR 5) is in the process of upgrading the CF-18A to maintain its technical currency over the next 20 years. Part of this upgrade will be the inclusion of a Helmet Mounted Display (HMD) with a Night Vision Imaging System (NVIS) capability.
The Defence and Civil Institute of Environmental Medicine (DCIEM) has undertaken an investigation of HMD and NVIS technologies in order to provide DAR with advice on human factors issues that may arise from their use in the CF-18A. The investigation will focus on the Air to Ground role of the CF-18A as this is the most likely role in North Atlantic Treaty Organization (NATO) and coalition activities. The Air to Ground role of the CF-18A also presents a high cognitive demand on the skills and abilities of the pilot.
This report is the second of two Human Factors Engineering (HFE) reports prepared for DCIEM in support of DAR 5. The first report is a Mission Analysis Report of CF18 Air to Ground Operations and should be read in conjunction with this report. This report provides the detailed results of an HFE study of the employment of the CF-18A in an operational Air to Ground environment. The analysis was conducted without the inclusion of the HMD in order to provide a baseline for assessing the future impact of HMD and NVIS procurements on the modernized fighter.
This report includes a Goal Decomposition, Goal Allocation, Operation Sequence Diagrams, Critical Goal Analysis and a Perceptual Control Theory (PCT) based Information Flow and Processing Analysis. The results of the HFE Analysis will be used to assess the impact of HMD and NVG technologies and the flow of information in the cockpit of the Modernized CF-18A.

15 KEYWORDS, DESCRIPTORS or IDENTIFIERS

(U) F18; CF18A; air to ground