Automatically Generated Test Frames from an S Specification of Separation Minima for the North Atlantic Region

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Abstract

A partially automated process for generating tests has been experimentally applied to a formal specification of a real world specification for air traffic separation minima. This report discusses the problems addressed by this process along with how and why this automation was achieved.

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Contents

1 Introduction

This document reports on the semi-automatic generation of a set of 169 test frames from a formal specification of aircraft separation minima for the North Atlantic. Appendices C and D contain 169 test frames which were automatically generated by a software tool from a parseable representation of the separation minima. Figure 1 provides a sample of one of the automatically generated test frames. The combined set of 169 test frames provides complete coverage of all conditions contained in the separation minima specification. This completeness is defined by a precise coverage criterion. 125 of the 169 test frames contained in Appendix C are instances of the "separation exists" condition. The remaining 44 test frames are instances of the "separation does not exist" condition.

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (IsWestOf60W B) 6. ¬ (InWATRSAirspace B) 7. ReportedOverCommonPoint (A , B) 8. ept (A , B) + 10 < "separation check time"	1. "are separated" (A , B)

Figure 1: A test frame from Appendix C.

Each test frame specifies a specific combination of conditions corresponding to a single step in a test procedure.[1] The contents of the "Stimuli" field of each test frame are used to determine the contents of the "Stimuli" field of a test step. A test engineer would refine a test frame into a test step by entering appropriate data values into the "Stimuli" and "Responses" fields of the test step such that the "Stimuli" of the test frame are satisfied.

The test frames in this report are provided as a demonstration of the capability of this test generation approach to produce test frames for a logically complex specification. It is expected that these 169 test frames could be used

[1] A test procedure is a sequence of test steps. Each test step contributes to the demonstration that a specified requirement has indeed been implemented.

directly by test engineers in the development of test procedures for systems that monitor air traffic over the North Atlantic.

The generation of these 169 test frames was performed by means of an algorithm based on a specific, precisely defined coverage criterion. The separation minima were originally written in a formal table notation [1] and was not authored with the intention of generating test frames. The formal specification of this separation minima is based on a description provided in a source document entitled "Application of Separation Minima for the NAT Region" (3rd edition, effective December 1992) published by Transport Canada on behalf of the ICAO North Atlantic Systems Planning Group. The table-based specification was algorithmically translated into an S [6] specification. This report addresses the algorithmic derivation of test frames from this S specification. The coverage criterion used to generate test frames is similar to the intuitive notion that a test exists for each cell in the table-based specification. Each step in this derivation is a logical inference. These inferences can be grouped into meta-steps which parallel the steps that would be taken by a test engineer in a manual process.

Section 2 of this report outlines a process for the refinement of test frames from Appendix C or D into test steps within a test procedure. An overview of the process used to generate the test frames contained in Appendices C and D is briefly described in Section 3. The coverage criterion determines the number of test frames generated as well as serving as the basis of any claim about the completeness of a test procedure. Section 4 provides a description of the coverage criterion used to generated the test frames. Appendix B provides a mathematical definition of this coverage criterion. For each of the test frames, all of the conditions specified in the "Stimuli" field of the test frame are both necessary and sufficient. Section 5 of this report describes an alternate approach which supplements the necessary and sufficient conditions with additional conditions that fully differentiate the test frame from other test frames as a means of helping the test engineer ensure that the expected response has a unique cause. The time required to generate these test frames is described in Section 6. A brief summary of this report is provided in Section 7. The S specification of the separation minima is given in Appendix A.

2 Test Steps from Test Frames

A softcopy of the test frames can be developed into test steps by following the steps below:

1. Sequence the test frames into outlines of test procedures.

2. For each test frame in an outline, select appropriate values that satisfy the stimuli specified by the test frame in a manner compatible with the response in the previous test step.

If it is not possible to select values in step 2, either the outline is infeasible or previously selected values must be adjusted to construct a feasible test procedure.

3 Test Frame Generation: Process Overview

This overview provides a brief introduction to the test frame generation process. Details of this process are not essential to the use of the test frames in Appendices C and D. The process used to generate test frames uses an S specification of system requirements and a test frame generation tool, TCG. The purpose of this process is to enhance the current manual process through automation while leaving enough flexibility for engineering judgement to be applied. Figure 2 illustrates this process.

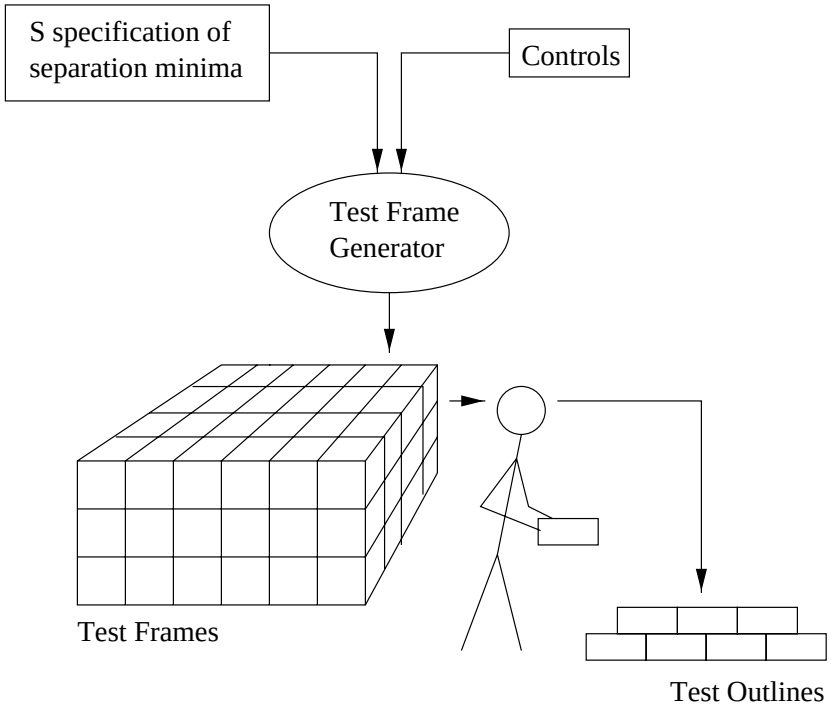

Figure 2: Automatic Generation of Test Frames

Once an S specification has been obtained, the process of generating test frames involves the following steps:

1. Ensure that the specification is composed of stimulus/response requirements of a system. For example, the original S specification simply stated the conditions for separation and did not specify requirements for a system. This was easily translated into the stimulus/response system requirements specification

   ```
   forall A B.AreSeparated (A,B) ⇔ "are separated" (A,B).
   ```

   This specification requires that the system indicate that two aircraft are separated precisely when they are separated according to the requirements specified by `AreSeparated(A,B)`.

2. Add domain knowledge to document dependencies between conditions. This information is used to eliminate infeasible tests. The separation minima specification contained dependency information that was converted into the form expected by TCG.

3. Use the TCG tool to generate test frames from the S specification.

The test frames produced by this process can be used to derive test steps as described in Section 2.

4 Coverage Criteria

The completeness of a test set is determined by a coverage criterion. The test frames in Appendices C and D were generated using a condition coverage criterion. In common terms, this criterion ensures that there is at least one test frame for each condition in the S specification of the requirements. This coverage criterion is based on a mathematical foundation [2]. The precise mathematical definition of this coverage criterion is given in Appendix B. This coverage criterion is intended to be a precise interpretation of the guidance provided in paragraph 6.4.4.1(a)[2] of DO178B [7]: "test cases exist for each software requirement."

This coverage criterion is illustrated by the following example:

> The condition R exists if all of the following conditions are satisfied:
>
> 1. condition A is true or condition B is true, and
> 2. condition C is true or condition D is true.

In this example, the letters A, B, C, D, and R are used to symbolically represent a set of conditions. For instance, the letter A may actually be a phrase such as "the target is using standard pressure setting." Given that each of the four

[2] 6.4.4.1(b) refers to data selection.

conditions A, B, C, and D can be true or false, there are sixteen possible logical combinations of these values. But, of course, it is not practical to generate test steps for each of the possible logical combinations since, in general, the number of test cases would grow exponentially with the number of conditions. The coverage criterion defined mathematically in Appendix B, requires each requirement to be verified once in the sense that every condition must appear in at least one test procedure step. The coverage criterion also requires the conditions to be both necessary and sufficient. For the above example, these constraints can be satisfied by just two test procedure steps. A step in which condition A and condition C are both true together with a step in which condition B and condition D are true would satisfy this coverage criterion. An equally valid combination is a step in which condition A and condition D are both true together with a step in which condition B and condition C are true.

5 Test Frame Styles

The TCG tool is capable of listing conditions for test frames in one of two styles. The "base style" lists only those conditions that are necessary and sufficient to cause the response. However, this list may not be sufficient to differentiate this cause of the response from that of an overlapping test frame. For this purpose test frame conditions can be listed using the "differentiated style." The style is selected by the test engineer.

The difference between "base style" and "differentiated style" is illustrated in the following example.

```
Produce response R if any of the following conditions are
true:

 1. the value of field X is less than 5,
 2. the value of field Y is less than 3, or
 3. the value of field Z is less than 7.
```

The test frames for this fragment using a base style are:

–Test Frame 1:

Stimuli	Response
1. X < 5	1. R

–Test Frame 2:

Stimuli	Response
1. Y < 3	1. R

–Test Frame 3:

Stimuli	Response
1. Z < 7	1. R

This style allows for the maximum amount of choice exercised by test engineers in constructing test steps. However, while specifying the test step corresponding to test frame 1, it may be necessary to specify values for Y and Z. The test step corresponding to:

Stimulus	Response
1. X = 4	1. R
2. Y = 2	
3. Z = 8	

does not differentiate between test frames 1 and 2. The differentiated style can assist test engineers by adding constraints to the list of conditions that differentiate the test frames. In this example the set of differentiated test frames is:

–Test Frame 1:

Stimuli	Response
1. Y < 3	1. R
2. ¬ (X < 5)	
3. ¬ (Z < 7)	

–Test Frame 2:

Stimuli	Response
1. Z < 7	1. R
2. ¬ (X < 5)	
3. ¬ (Y < 3)	

–Test Frame 3:

Stimuli	Response
1. X < 5	1. R
2. ¬ (Y < 3)	
3. ¬ (Z < 7)	

Differentiated test frames can be useful in ensuring that test engineers construct test steps that are differentiated. However, in some cases, test frame differentiation takes significant processing time and there may be several alternatives to choose from in order to achieve differentiation. In the TCG prototype, the choice between alternatives is arbitrary and might not always be appropriate according to best engineering judgement.

As a second example, compare a test frame for longitudinal separation (Appendix C.1.3) with its differentiated form (Appendix D.1.3). The base test frame is,

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (IsWestOf60W B) 6. ¬ (InWATRSAirspace B) 7. ReportedOverCommonPoint (A , B) 8. ept (A , B) + 10 < "separation check time"	1. "are separated" (A , B)

and the differentiated version of the same test frame is,

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (IsWestOf60W B) 6. ¬ (InWATRSAirspace B) 7. ReportedOverCommonPoint (A , B) 8. ept (A , B) + 10 < "separation check time" 9. ¬ (VerticallySeparated (A , B)) 10. ¬ (LaterallySeparated (A , B)) 11. EnterWATRSAirspaceAtSomeTime A 12. EnterWATRSAirspaceAtSomeTime B 13. IsWestOf60W A 14. MachTechniqueUsed A 15. MachTechniqueUsed B 16. OnPublishedRoute A 17. OnPublishedRoute B 18. "SameOr Diverging Tracks" (A , B) 19. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

The advantage of the differentiated test frame is that these conditions ensure there is no overlap with another test frame for vertical separation. The

disadvantage is that there may be several different ways to differentiate the test frame, but the current prototype test frame generator takes this flexibility away from the engineer by making an arbitrary choice. It is important to note that test frame style is independent of coverage criteria.

6 Processing Times

Computing the base test frames required a total of three hours[3] on an Ultra-Sparc 60. Computing the differentiated test frames required five and a half hours on the same machine. Constructing an initial set of scripts for generating test frames took approximately one hour.

Since the S specification (Appendix A) is large and complex, the TCG tool does not have the capacity to process it in full detail. An iterative approach was used to overcome this problem. In the first iteration, the specification was expanded to a level of detail that could be processed by the TCG tool. The resulting test frames contain non-primitives which were expanded in subsequent iterations.

The condition dependencies listed at the end of the S specification where added when infeasible test frames were found in the TCG output or when the TCG tool found no feasible test frames in a particular iteration. (Finding no feasible test frames implies that the input specification for that iteration was also infeasible.) This added a few days to the construction of the scripts for generating feasible test frames. This was due to condition dependencies which exist between different levels of abstraction within the specification. This suggests that although this iterative approach is capable of processing large, complex formal specifications, more work is required to allow this particular type of condition dependencies to be determined with less effort.

7 Summary

This document has reported the production of 169 test frames using an automated process. Test frames can be used during test development to construct test steps within test procedures. The automatic production of test frames from an S specification of system requirements has the potential to reduce the labour required to produce test steps for logically complex conditions such as rules of aircraft separation. In addition, the test frames are produced according to a precise definition of coverage which ensures the coverage provided by the test frames is consistent and homogenous. Conditions for test frames can be listed in one of two styles: 1) necessary and sufficient, or 2) necessary and sufficient along with additional conditions to ensure no test step can satisfy more than one test frame.

[3] The times given are the elapsed time reported by the unix time utility.

The same approach can be applied to other specification languages with a similar semantics [3]. Other issues including requirements tracking (traceability) and specification readability issues, can also be found in [3]. Further details of this research can be found in [5, 4, 8].

Acknowledgments

Nancy Day generated the original version of the S specification of the separation minima for the purpose of this case study from its tabular form in [1]. Conversations with Jim Ronback regarding notions of coverage have been invaluable. Comments by Jeff Joyce have contributed to the presentation of this report.

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http://www.cs.ubc.ca/formalWARE

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A S Specification

Any alterations from the original S specification are indicated by "`% mrd`."

```
% Converted to S / Fuss 2.51 by Michael Donat, Feb 1998
% minima.s
% Nancy A. Day
% 22 Jan 98

%sourcefile SeparationMinimaSpec.hpp

%linenum 723
%include table.s

%linenum 570
:flight;
%linenum 572
:location := Azores | BDA | CAN | Caribbean | IberianPeninsula
            | Iceland | Scandinavia | UnitedKingdom | USA ;

%linenum 576
:segment;
%linenum 577
:time == num;
%linenum 713
 Min: ((num)set -> num);

% mrd

forall (a,b,S).
    Min (INSERT a (INSERT b S)) =
        (if a < b then Min (INSERT a S) else Min (INSERT b S));
forall a.Min {a} = a;

%linenum 115

Routes1 := {(USA,BDA);(CAN,BDA);(IberianPeninsula, Azores);
(Iceland,Scandinavia);(Iceland, UnitedKingdom)};

%linenum 119

Routes2 := {(USA,Caribbean);(CAN,Caribbean);(BDA, Caribbean)};

%linenum 413
```

```
"WATRSSameDir LongSep" : (flight#flight) -> num;

%linenum 417
"WATRSOppDir NoLongSepPeriod": (flight#flight) -> (time#time);

%linenum 467

Routes3 :=
 {(USA,Caribbean);(CAN,Caribbean);
 (BDA, Caribbean);(USA,BDA); (CAN,BDA)};

%linenum 587
IsSupersonic :(flight -> bool);
%linenum 588
IsTurbojet :(flight -> bool);
%linenum 589
HavePartOfRouteInMNPSAirspace : (flight -> bool) ;
%linenum 591
MeetMNPS :(flight -> bool);
%linenum 592
OnPublishedRoute :(flight -> bool);
%linenum 593
RouteDeparture :(flight -> location);
%linenum 594
RouteDestination :(flight -> location);
%linenum 596
MachTechniqueUsed : flight ->bool;
%linenum 603
FlightLevel:(flight -> num);
%linenum 604
InCruiseClimb:(flight -> bool);
%linenum 605
InWATRSAirspace :(flight -> bool);
%linenum 606
IsLevel:(flight -> bool);
%linenum 607
IsOutsideMNPSAirspace :(flight -> bool);
%linenum 609
IsWestOf60W :(flight -> bool);
%linenum 610
IsWestOf55W:(flight -> bool);
%linenum 611
"LatChange Per10DLong LessThanOrEq1" :flight->bool;
%linenum 613
```

```
"LatChange Per10DLong LessThanOrEq2" :flight->bool;
%linenum 615
"LatChange Per10DLong LessThanOrEq3" :flight->bool;
%linenum 617
LateralPositionInDegrees :(flight -> num);
%linenum 619
LateralPositionInMiles :(flight -> num);
%linenum 621
Mach : (flight->num);
%linenum 622
RouteSegment :(flight -> segment);
%linenum 623
"RouteSegment Degrees" :(flight -> num);
%linenum 624
TimeAtPosition :(flight->time);
%linenum 629
SameType :((flight # flight) -> bool);
%linenum 635
SameMachNumber :((flight # flight) -> bool);
%linenum 637
FirstAircraft :((flight # flight) -> flight);
%linenum 639
ept : ((flight # flight)->time);
%linenum 640
"SameOr Diverging Tracks"  :((flight # flight) -> bool);
%linenum 642
SecondAircraft :((flight # flight) -> flight);
%linenum 647
ReportedOverCommonPoint :((flight # flight) -> bool);
%linenum 649
"Appropriate TimeSep AtCommon Point":((flight # flight) -> bool);
%linenum 651
EnterWATRSAirspaceAtSomeTime : (flight -> bool);
%linenum 657
AngularDifferenceGreaterThan90Degrees:(segment # segment)->bool;
%linenum 668
% mrd
StartTime (s:time, e:time) := s;
%linenum 672
% mrd
EndTime (s:time, e:time) := e;
%linenum 677
MinEarliestTime : (time # time)set -> time;
%linenum 682
```

```
MaxLatestTime : (time # time)set -> time;

% mrd

forall (p,x,S).MaxLatestTime (INSERT p (INSERT x S)) =
    (let a := EndTime p in
     let b := MaxLatestTime (INSERT x S) in
    if a > b then a else b);

forall p.MaxLatestTime (INSERT p EMPTY) = EndTime p;

forall (p,x,S).MinEarliestTime (INSERT p (INSERT x S)) =
    (let a := StartTime p in
     let b := MinEarliestTime (INSERT x S) in
    if a < b then a else b);

forall p.MinEarliestTime (INSERT p EMPTY) = StartTime p;

%linenum 97

VerticalSeparationRequired (A,B) := Table
[Row (FlightLevel (A)) [(\x.x <= 280); DC ; (\x.x>450);(\x.x>450)];
 Row (FlightLevel (B)) [DC;(\x.x <= 280);(\x. x > 450);(\x.x>450)];
 Row (IsSupersonic (A)) [DC;DC;TRUE;DC];
 Row (IsSupersonic (B)) [DC;DC;DC;TRUE] ]
[1000;1000;4000;4000;2000];


%linenum 128

IsOnRoute (R:(location#location)set) (X:flight) :=
   ((RouteDeparture (X), RouteDestination (X)) In R) OR
    ((RouteDestination (X), RouteDeparture (X)) In R);

% mrd

forall (a,b,c,d).((a,b) = (c,d)) = (a = c) /\ (b = d);

%linenum 136

FlightLevelAbove275 (X:flight) := FlightLevel X > 275;

%linenum 142
```

```
"LateralSeparation RequiredInDegrees" (A,B) := Table
[Row (AllOf [A;B] IsOutsideMNPSAirspace) [TRUE;TRUE;DC;DC];
 Row (AllOf [A;B] (IsOnRoute (Routes1))) [TRUE;DC;DC;DC];
 Row (AllOf [A;B] (IsOnRoute (Routes2))) [DC;TRUE;DC;DC];
 Row (AllOf [A;B] IsWestOf55W) [DC;TRUE;DC;DC];
 Row (AllOf [A;B] IsSupersonic) [DC;DC;TRUE;DC];
 Row (AllOf [A;B] FlightLevelAbove275) [DC;DC;TRUE;DC];
 Row (AllOf [A;B] MeetMNPS) [DC;DC;DC;TRUE];
 Row (AllOf [A;B] HavePartOfRouteInMNPSAirspace) [DC;DC;DC;TRUE]]
[1.5;1.5;1;1;2];

%linenum 160

"LateralSeparation RequiredInMiles" (A,B) := Table
[Row (AllOf [A;B] IsOutsideMNPSAirspace) [TRUE;TRUE;DC;DC];
 Row (AllOf [A;B] (IsOnRoute (Routes1))) [TRUE;DC;DC;DC];
 Row (AllOf [A;B] (IsOnRoute (Routes2))) [DC;TRUE;DC;DC];
 Row (AllOf [A;B] IsWestOf55W) [DC;TRUE;DC;DC];
 Row (AllOf [A;B] IsSupersonic) [DC;DC;TRUE;DC];
 Row (AllOf [A;B] FlightLevelAbove275) [DC;DC;TRUE;DC];
 Row (AllOf [A;B] MeetMNPS ) [DC;DC;DC;TRUE];
 Row (AllOf [A;B] HavePartOfRouteInMNPSAirspace) [DC;DC;DC;TRUE]]
[90;90;60;60;120];

%linenum 190

LatitudeEquivalent (A,B) := PredicateTable
[Row ("RouteSegment Degrees" A)
  [(\x.x<=58);DC;(\x.(58<x) AND (x<70));DC;(\x.(70<=x) AND (x<=80));DC];
 Row ("RouteSegment Degrees" B)
  [DC;(\x.x<=58);DC;(\x.(x>58) AND (x<70));DC;(\x.(70<=x) AND (x<=80))];
 Row (AllOf [A;B] "LatChange Per10DLong LessThanOrEq3")
  [TRUE;TRUE;DC;DC;DC;DC];
 Row (AllOf [A;B] "LatChange Per10DLong LessThanOrEq2")
  [DC;DC;TRUE;TRUE;DC;DC];
 Row (AllOf [A;B] "LatChange Per10DLong LessThanOrEq1")
  [DC;DC;DC;DC;TRUE;TRUE]];

%linenum 243

"ssOppDir NoLongSepPeriod" (A,B) := Table
[Row (ReportedOverCommonPoint(A,B)) [TRUE;FALSE]]
[(ept(A,B),ept(A,B)+10);(ept(A,B)-15,ept(A,B)+15)];
```

```
%linenum 266

ssSubcondition(A,B) := PredicateTable
[Row (AllOf [A;B] IsLevel) [TRUE;DC];
 Row (SameMachNumber (A,B)) [TRUE;DC];
 Row (SameType(A,B)) [DC;TRUE];
 Row (AllOf [A;B] InCruiseClimb ) [DC;TRUE]];

%linenum 336

UnionOfRange (periods) :=
 (MinEarliestTime (periods), MaxLatestTime (periods));

%linenum 360

MNPSCondition(A,B) :=
(AllOf [A;B] MeetMNPS ) AND
(AllOf [A;B] HavePartOfRouteInMNPSAirspace );

%linenum 371

"MNPSOppDir NoLongSepPeriod"(A,B) := "ssOppDir NoLongSepPeriod"(A,B);

%linenum 380

"MNPSSameDir LongSep" (A,B) := Table
[Row ("Appropriate TimeSep AtCommon Point" (A,B))
[TRUE;TRUE;TRUE;TRUE;TRUE];
 Row ("SameOr Diverging Tracks" (A,B)) [TRUE;TRUE;TRUE;TRUE;TRUE];
 Row (Mach (FirstAircraft (A,B)) - Mach (SecondAircraft (A,B)))
[(\x. (x>0.06));(\x. ((0.06>=x) AND (x>0.05)));(\x. ((0.05>=x) AND (x>0.04)));
(\x. ((0.04>=x) AND (x>0.03)));(\x. ((0.03>=x) AND (x>0.02)))]]
[5;6;7;8;9;10];

%linenum 395

WATRSCondition(A,B) := PredicateTable
[Row (AllOf [A;B] EnterWATRSAirspaceAtSomeTime ) [TRUE;TRUE];
 Row (AllOf [A;B] IsWestOf60W ) [TRUE;DC];
 Row (AllOf [A;B] InWATRSAirspace) [DC;TRUE];
 Row (AllOf [A;B] MachTechniqueUsed ) [TRUE;TRUE];
 Row (AllOf [A;B] OnPublishedRoute) [TRUE;TRUE];
 Row ("SameOr Diverging Tracks" (A,B)) [TRUE;TRUE]];
```

```
%linenum 432

"genOppDir NoLongSep Period"(A,B) := "MNPSOppDir NoLongSepPeriod"(A,B);

%linenum 440

"genSameDir LongSep" (A,B) := Table
[Row ("SameOr Diverging Tracks" (A,B)) [TRUE;TRUE;TRUE];
 Row (AllOf [A;B] MachTechniqueUsed ) [FALSE;TRUE;TRUE];
 Row (AtLeastOneOf [A;B] InCruiseClimb ) [FALSE;FALSE;FALSE];
 Row (ReportedOverCommonPoint (A,B) ) [TRUE;DC;DC];
 Row ("Appropriate TimeSep AtCommon Point" (A,B)) [DC;TRUE;TRUE];
 Row (Mach (FirstAircraft(A,B)) - Mach (SecondAircraft(A,B)))
      [DC;(\x. (x>0.6));(\x. (0.6>=x) AND (x>0.3))]]
[15;5;10;20];

%linenum 459

"otherOppDir NoLongSepPeriod" (A,B) := "genOppDir NoLongSep Period"(A,B);

%linenum 474

otherSameDirLongSep (A,B) := Table
[Row (ReportedOverCommonPoint(A,B)) [TRUE;DC];
 Row ("SameOr Diverging Tracks"(A,B)) [TRUE;DC];
 Row (AllOf [A;B] (IsOnRoute Routes3)) [DC;TRUE]]
[15;20;30];

%linenum 492

env1 :=
(forall (A:flight).  NOT (IsLevel (A) AND InCruiseClimb (A)))
AND
(forall (A:flight).NOT (IsOnRoute (Routes1) (A) AND IsOnRoute (Routes2) (A)));

% mrd env1

forall A.MutEx [IsLevel (A); InCruiseClimb (A)];
forall A.MutEx [IsOnRoute (Routes1) (A); IsOnRoute (Routes2) (A)];


%linenum 501

env2 :=
```

```
(forall (A:flight) (B:flight).
 ReportedOverCommonPoint(A,B) = ReportedOverCommonPoint(B,A))
AND
(forall (A:flight) (B:flight).
 SameMachNumber(A,B) = SameMachNumber(B,A))
AND
(forall (A:flight) (B:flight).
 SameType(A,B) = SameType(B,A))
AND
(forall (A:flight) (B:flight).
 "SameOr Diverging Tracks"(A,B) = "SameOr Diverging Tracks"(B,A))
AND
(forall (A:flight) (B:flight).
 "Appropriate TimeSep AtCommon Point"(A,B) =
    "Appropriate TimeSep AtCommon Point"(B,A)) ;

% mrd env2

forall (A,B).Subsm [ReportedOverCommonPoint(A,B); ReportedOverCommonPoint(B,A)];
forall (A,B).Subsm [SameMachNumber(A,B); SameMachNumber(B,A)];
forall (A,B).Subsm [SameType(A,B); SameType(B,A)];
forall (A,B).
    Subsm ["SameOr Diverging Tracks"(A,B); "SameOr Diverging Tracks"(B,A)];
forall (A,B).Subsm [
    "Appropriate TimeSep AtCommon Point"(A,B);
    "Appropriate TimeSep AtCommon Point"(B,A)];


%linenum 523

env3 :=
(forall A.
 if "LatChange Per10DLong LessThanOrEq2" (A)
 then "LatChange Per10DLong LessThanOrEq3" (A))
AND
(forall A.
 if "LatChange Per10DLong LessThanOrEq1" (A)
 then "LatChange Per10DLong LessThanOrEq2" (A))
AND
(forall A.
 if "LatChange Per10DLong LessThanOrEq1" (A)
 then "LatChange Per10DLong LessThanOrEq3" (A));

% mrd env3
```

```
forall A.Subsm [
    "LatChange Per10DLong LessThanOrEq3" A;
    "LatChange Per10DLong LessThanOrEq2" A;
    "LatChange Per10DLong LessThanOrEq1" A];


%linenum 540

env := env1 AND env2 AND env3;

%linenum 254

ssSameDirLongSep(A,B) := Table
[Row (ssSubcondition(A,B)) [TRUE;TRUE];
 Row ("SameOr Diverging Tracks"(A,B)) [TRUE;TRUE];
 Row (ReportedOverCommonPoint(A,B)) [TRUE;DC];
 Row ("Appropriate TimeSep AtCommon Point"(A,B)) [DC;TRUE]]
[10;10;15];

%linenum 306

MinAll(A,B) :=
    Min {
         "MNPSSameDir LongSep"(A,B);
         "WATRSSameDir LongSep"(A,B);
         "genSameDir LongSep"(A,B)};

%linenum 341

UnionAll (A,B) :=
    let periods :=
              {"MNPSOppDir NoLongSepPeriod"(A,B);
               "WATRSOppDir NoLongSepPeriod"(A,B);
               "genOppDir NoLongSep Period"(A,B)} in
    (MinEarliestTime (periods), MaxLatestTime (periods));

%linenum 291

"turbojetSameDir LongSep" (A,B) := Table
[Row (MNPSCondition (A,B)) [TRUE;FALSE;TRUE;FALSE];
 Row (WATRSCondition (A,B)) [TRUE;TRUE;FALSE;FALSE]]
[MinAll (A,B);
 Min { "WATRSSameDir LongSep" (A,B);
```

```
     "genSameDir LongSep" (A,B)};
 Min { "MNPSSameDir LongSep" (A,B);
     "genSameDir LongSep" (A,B)};
 "genSameDir LongSep" (A,B)];

%linenum 318

"turbojetOppDir NoLongSepPeriod" (A,B) := Table
[Row (MNPSCondition (A,B)) [TRUE;FALSE;TRUE;FALSE];
 Row (WATRSCondition (A,B)) [TRUE;TRUE;FALSE;FALSE]]
[UnionAll (A,B);
 UnionOfRange { "WATRSOppDir NoLongSepPeriod" (A,B);
          "genOppDir NoLongSep Period" (A,B)};
 UnionOfRange { "MNPSOppDir NoLongSepPeriod" (A,B);
         "genOppDir NoLongSep Period" (A,B)};
 "genOppDir NoLongSep Period" (A,B)];

%linenum 219

LongSameDirSepRequired (A,B) := Table
[Row (AllOf [A;B] IsSupersonic ) [TRUE;FALSE];
 Row (AllOf [A;B] IsTurbojet ) [DC;TRUE]]
[ssSameDirLongSep (A,B);"turbojetSameDir LongSep" (A,B);otherSameDirLongSep
(A,B)];

%linenum 226

"OppDir NoLongSepPeriod" (A,B) := Table
[Row (AllOf [A;B] IsSupersonic ) [TRUE;FALSE];
 Row (AllOf [A;B] IsTurbojet) [DC;TRUE]]
["ssOppDir NoLongSepPeriod" (A,B);"turbojetOppDir NoLongSepPeriod" (A,B);
"otherOppDir NoLongSepPeriod" (A,B)];

%linenum 212

/* mrd

WithinOppDirNoLongSepPeriod refers to the time at which separation is
considered.  Since all other predicates are assumed to refer to this same
time, the variable "separation check time" is used to represent it.
This is more appealing than adding a time parameter to each of the other
predicates.  This removes time as a parameter from AreSeparated.

If it were necessary to consider separation at two different times,
```

```
then each of the predicates would need to be parameterized by the
time at which separation was being considered.

*/

"separation check time" : time;

WithinOppDirNoLongSepPeriod(A:flight,B:flight) :=
  let t := "separation check time" in
  let timePeriod := "OppDir NoLongSepPeriod"(A,B) in
  (StartTime(timePeriod) <= t) AND (t <= EndTime(timePeriod));

%linenum 60

% mrd

ABS : num -> num;


/* mrd */

/* A and B are vertically separated based on flight level */
VerticallySeparated(A,B) :=
    ABS(FlightLevel A - FlightLevel B) > VerticalSeparationRequired(A,B);

/* A and B are laterally separated based on either position in degrees
       of latitude or position in miles */
LaterallySeparated(A,B) :=
    if (LatitudeEquivalent(A,B))
    then
      (ABS(LateralPositionInDegrees A - LateralPositionInDegrees B) >
           "LateralSeparation RequiredInDegrees" (A,B))
    else
      (ABS(LateralPositionInMiles A - LateralPositionInMiles B) >
           "LateralSeparation RequiredInMiles" (A,B));

/* A and B are longitudinally separated based on time
       depending on whether the two flights are in the approximate
       same or opposite direction */
LongitudinallySeparated(A,B) :=
    if (AngularDifferenceGreaterThan90Degrees
           (RouteSegment A, RouteSegment B))
    then     /* opposite direction */
        NOT (WithinOppDirNoLongSepPeriod(A,B))
```

```
    else     /* same direction */
        ABS(TimeAtPosition A - TimeAtPosition B) >
              LongSameDirSepRequired(A,B);

AreSeparated(A:flight,B:flight) :=
    VerticallySeparated(A,B) OR
    LaterallySeparated(A,B) OR
    LongitudinallySeparated(A,B);


%condition "ssOppDir NoLongSepPeriod"
%condition ssSubcondition
%condition "genSameDir LongSep"
%condition ssSameDirLongSep
%condition "turbojetSameDir LongSep"
%condition "turbojetOppDir NoLongSepPeriod"

/* Misc simplification */

forall (a,b).a < a - b = b < 0;
forall (a,b).a - b < a = b > 0;
forall (a,b).a <= a - b = b <= 0;
forall (a,b).a - b <= a = b >= 0;
forall (a,b,c).a + b < a + c = b < c;
forall (a,b,c).a + b <= a + c = b <= c;

/* Condition dependencies for differentiated test frames */

forall a.MutEx [
     ~ ("LatChange Per10DLong LessThanOrEq2" a);
        "LatChange Per10DLong LessThanOrEq3" a];

forall a.MutEx [
     ~ ("LatChange Per10DLong LessThanOrEq1" a);
        "LatChange Per10DLong LessThanOrEq3" a];

forall a.MutEx [
     ~ ("LatChange Per10DLong LessThanOrEq1" a);
        "LatChange Per10DLong LessThanOrEq2" a];

/* - dependencies required due to iteration */

forall (A,B).MutEx [
    "separation check time" < ept (A, B);
```

```
    EndTime ("turbojetOppDir NoLongSepPeriod" (A , B))
        < "separation check time"];

forall (A,B,x).x > 0 ==> MutEx [
    "separation check time" < ept (A, B) - x;
    EndTime ("turbojetOppDir NoLongSepPeriod" (A , B))
        < "separation check time"];

forall (A,B).MutEx [
    "separation check time"
        < StartTime ("turbojetOppDir NoLongSepPeriod" (A , B));
    ept (A , B) <= "separation check time"];

forall (A,B,x).x > 0 ==> MutEx [
    "separation check time"
        < StartTime ("turbojetOppDir NoLongSepPeriod" (A , B));
    ept (A , B) + x <= "separation check time"];

forall (A,B).~ (ReportedOverCommonPoint (A , B)) ==> MutEx [
    "separation check time" <
              StartTime ("turbojetOppDir NoLongSepPeriod" (A , B));
    ept (A , B) - 15 <= "separation check time"
    ];
```

B Mathematical Definition of Term Coverage

The definition of Term Coverage is based on definitions of test classes, test frames, frame stimuli, and test class normal form [2]. The definition of Term Coverage expresses a relationship between frame stimuli within test frames and the frame stimuli of a test class normal form of the specification. The mathematical definition of Term Coverage follows.

The following definitions are assumed:

- Let $C_i, 1 \leq i \leq n$, represent the n test classes of specification Q, i.e., $Q = C_1 \wedge ... \wedge C_n$.
- Let c_i represent the test class antecedent of C_i.
- Let Conj(E) represent the set of conjuncts in an expression E.

Now, let $S(E)$ represent the set of frame stimuli in the test class normal form of an expression, E, i.e.,

$$S = \{s | \exists i . C_i \in \text{Conj}(TC(E)) \wedge s \in FS(c_i)\},$$

where TC is the test class algorithm and $FS(c)$ represents the set of frame stimuli obtained from the test class antecedent, c, as determined by the test frame generation algorithms [2].

Let f_{ik} represent the antecedent of the k^{th} test frame F_{ik} derived from C_i, i.e.,

$$\forall ik . (f_{ik} \Rightarrow c_i) \wedge \forall e . (e \Rightarrow c_i) \Rightarrow \text{Conj}(e) \not\subset \text{Conj}(f_{ik}). \quad (1)$$

Equation (1) states that F_{ik} is a valid test frame of test class C_i and f_{ik} is a prime implicant. The F_{ik} test frames satisfy Term Coverage of a specification, E, when:

$$\forall s \in S(E) . \exists ik . s \in \text{Conj}(f_{ik}). \quad (2)$$

An alternative variation of Term Coverage is where the coverage of the F_{ik} test frames is measured relative to each individual test class rather than the specification as a whole:

$$\forall i . C_i \in \text{Conj}(TC(E)) \Rightarrow \forall s \in S(C_i) . \exists k . s \in \text{Conj}(f_{ik}). \quad (3)$$

C Base Test Frames

Due to the logical complexity of the given specification it was necessary to apply the test frame generator iteratively. This was achieved by controlling which portions of the specification were treated as primitives and which were expanded according to their definitions. This section gives an account of how this iteration was performed.

In the first iteration, only the predicate `AreSeparated` was expanded. All other predicates and functions within the specification were treated as primitives. This resulted in the following expanded specification:

```
forall A.
  forall B.
    (~
       (VerticallySeparated (A , B) \/
          LaterallySeparated (A , B) \/
            LongitudinallySeparated (A , B)) \/
       "are separated" (A , B)) /\
      (~ ("are separated" (A , B)) \/
         VerticallySeparated (A , B) \/
           LaterallySeparated (A , B) \/ LongitudinallySeparated (A , B))
```

From this expansion, two test classes were generated; one for each of the responses `"are separated" (A , B)` and ¬ `("are separated" (A , B))`. An initial set of test frames was generated along with the test classes. The test frames are divided into groups depending from which test class they were derived, to which category of separation they belong, and on which iteration they were generated.

Test frames in earlier iterations may contain non-primitives (underlined). These are expanded by using the test frame as the specification for the test frame generator and allowing more of the non-primitives to be expanded for that iteration. Although a non-primitive may appear in several test frames, only one of the test frames is selected for expansion in the next iteration. This provides a means of achieving Term Coverage without generating too many test frames. The TCG tool generates test frames according to the test class version of term coverage (B.3). Using an iterative approach allows the TCG tool to be used to produce sets of test frames whose combination satisfies the specification version of term coverage (B.2).

This appendix contains base test frames. Of the 184 test frames listed below, 15 where used in subsequent iterations. Thus, 169 test frames can be used to produce test outlines. The test frames are numbered consecutively. The numbers in parentheses represent the ordinal of a test frame within the output for an iteration.

C.1 Test Frames for "Separation Exists"

–Test Frame 1(1) :

Stimuli	Response
1. VerticallySeparated (A , B)	1. "are separated" (A , B)

–Test Frame 2(2) :

Stimuli	Response
1. LaterallySeparated (A , B)	1. "are separated" (A , B)

–Test Frame 3(3) :

Stimuli	Response
1. LongitudinallySeparated (A , B)	1. "are separated" (A , B)

C.1.1 Vertical Separation

–Test Frame 4(1) :

Stimuli	Response
1. 450 < FlightLevel A 2. 450 < FlightLevel B 3. IsSupersonic A 4. 4000 < ABS (FlightLevel A – FlightLevel B)	1. "are separated" (A , B)

–Test Frame 5(2) :

Stimuli	Response
1. 280 < FlightLevel A 2. 280 < FlightLevel B 3. ¬ (IsSupersonic A) 4. ¬ (IsSupersonic B) 5. 2000 < ABS (FlightLevel A – FlightLevel B)	1. "are separated" (A , B)

–Test Frame 6(3) :

Stimuli	Response
1. FlightLevel A ≤ 280 2. 1000 < ABS (FlightLevel A – FlightLevel B)	1. "are separated" (A , B)

–Test Frame 7(4) :

Stimuli	Response
1. 1000 < ABS (FlightLevel A − FlightLevel B) 2. 280 < FlightLevel A 3. FlightLevel B ≤ 280	1. "are separated" (A , B)

–Test Frame 8(5) :

Stimuli	Response
1. 280 < FlightLevel A 2. 280 < FlightLevel B 3. FlightLevel A ≤ 450 4. 2000 < ABS (FlightLevel A − FlightLevel B)	1. "are separated" (A , B)

–Test Frame 9(6) :

Stimuli	Response
1. 280 < FlightLevel A 2. 280 < FlightLevel B 3. FlightLevel B ≤ 450 4. 2000 < ABS (FlightLevel A − FlightLevel B)	1. "are separated" (A , B)

–Test Frame 10(7) :

Stimuli	Response
1. 450 < FlightLevel A 2. 450 < FlightLevel B 3. 4000 < ABS (FlightLevel A − FlightLevel B) 4. IsSupersonic B	1. "are separated" (A , B)

C.1.2 Lateral Separation

–Test Frame 11(1):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. $\frac{\text{"LateralSeparation RequiredInMiles"}\ (A\ ,\ B)}{\text{ABS (LateralPositionInMiles A − LateralPositionInMiles B)}}$ <	1. "are separated" (A , B)

–Test Frame 12(2):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. "LateralSeparation RequiredInDegrees" (A , B) < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B)	1. "are separated" (A , B)

–Test Frame 13(3):

Stimuli	Response
1. 58 < "RouteSegment Degrees" A 2. "RouteSegment Degrees" A < 70 3. ¬ ("LatChange Per10DLong LessThanOrEq2" B) 4. 58 < "RouteSegment Degrees" B 5. "RouteSegment Degrees" B < 70 6. "LateralSeparation RequiredInMiles" (A , B) < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 14(4):

Stimuli	Response
1. "RouteSegment Degrees" A ≤ 58 2. ¬ ("LatChange Per10DLong LessThanOrEq3" B) 3. "RouteSegment Degrees" B ≤ 58 4. "LateralSeparation RequiredInMiles" (A , B) < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 15(5):

Stimuli	Response
1. ¬ ("LatChange Per10DLong LessThanOrEq3" A) 2. ¬ ("LatChange Per10DLong LessThanOrEq1" B) 3. "LateralSeparation RequiredInMiles" (A , B) < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 16(6):

Stimuli	Response
1. "RouteSegment Degrees" A $\leq$ 58 2. "LatChange Per10DLong LessThanOrEq3" A 3. "LatChange Per10DLong LessThanOrEq3" B 4. "LateralSeparation RequiredInDegrees" (A , B) < ABS (LateralPositionInDegrees A – LateralPositionInDegrees B)	1. "are separated" (A , B)

–Test Frame 17(7):

Stimuli	Response
1. "LatChange Per10DLong LessThanOrEq1" A 2. "LatChange Per10DLong LessThanOrEq1" B 3. 70 $\leq$ "RouteSegment Degrees" B 4. "RouteSegment Degrees" B $\leq$ 80 5. "LateralSeparation RequiredInDegrees" (A , B) < ABS (LateralPositionInDegrees A – LateralPositionInDegrees B)	1. "are separated" (A , B)

–Test Frame 18(8):

Stimuli	Response
1. 58 < "RouteSegment Degrees" A 2. "RouteSegment Degrees" A < 70 3. "LatChange Per10DLong LessThanOrEq2" A 4. "LatChange Per10DLong LessThanOrEq2" B 5. "LateralSeparation RequiredInDegrees" (A , B) < ABS (LateralPositionInDegrees A – LateralPositionInDegrees B)	1. "are separated" (A , B)

–Test Frame 19(9):

Stimuli	Response
1. ¬ ("LatChange Per10DLong LessThanOrEq3" B) 2. ¬ ("LatChange Per10DLong LessThanOrEq2" A) 3. "LateralSeparation RequiredInMiles" (A , B) < ABS (LateralPositionInMiles A – LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 20(10):

Stimuli	Response
1. ¬ ("LatChange Per10DLong LessThanOrEq3" B) 2. ¬ ("LatChange Per10DLong LessThanOrEq1" A) 3. "LateralSeparation RequiredInMiles" (A , B) < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 21(1):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. ¬ (IsOnRoute Routes1 B) 4. ¬ (IsWestOf55W B) 5. 60 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. FlightLevel A ≤ 275 7. MeetMNPS A 8. MeetMNPS B 9. HavePartOfRouteInMNPSAirspace A 10. HavePartOfRouteInMNPSAirspace B	1. "are separated" (A , B)

–Test Frame 22(2):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. IsOnRoute Routes2 A 7. IsOnRoute Routes2 B 8. IsWestOf55W A 9. IsWestOf55W B	1. "are separated" (A , B)

–Test Frame 23(3):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. ¬ (IsOnRoute Routes1 A) 4. ¬ (IsWestOf55W A) 5. IsSupersonic A 6. IsSupersonic B 7. 275 < FlightLevel A 8. 275 < FlightLevel B 9. 60 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 24(4):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. ¬ (IsOutsideMNPSAirspace B) 4. FlightLevel B ≤ 275 5. ¬ (HavePartOfRouteInMNPSAirspace B) 6. 120 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 25(5):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. ¬ (IsOutsideMNPSAirspace A) 4. ¬ (IsSupersonic B) 5. ¬ (HavePartOfRouteInMNPSAirspace A) 6. 120 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 26(6):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. ¬ (IsOnRoute Routes1 B) 4. ¬ (IsOnRoute Routes2 B) 5. ¬ (IsSupersonic A) 6. ¬ (MeetMNPS B) 7. 120 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 27(7):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. IsOnRoute Routes1 A 6. IsOnRoute Routes1 B 7. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 28(8):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. ¬ (IsOnRoute Routes1 B) 4. ¬ (IsOnRoute Routes2 A) 5. FlightLevel A ≤ 275 6. ¬ (MeetMNPS A) 7. 120 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 29(1):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. ¬ (IsOnRoute Routes1 B) 6. ¬ (IsWestOf55W B) 7. 1 < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) 8. FlightLevel A ≤ 275 9. MeetMNPS A 10. MeetMNPS B 11. HavePartOfRouteInMNPSAirspace A 12. HavePartOfRouteInMNPSAirspace B	1. "are separated" (A , B)

–Test Frame 30(2):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. IsOutsideMNPSAirspace A 6. IsOutsideMNPSAirspace B 7. 1.5 < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) 8. IsOnRoute Routes2 A 9. IsOnRoute Routes2 B 10. IsWestOf55W A 11. IsWestOf55W B	1. "are separated" (A , B)

–Test Frame 31(3):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. ¬ (IsOnRoute Routes1 A) 6. ¬ (IsWestOf55W A) 7. IsSupersonic A 8. IsSupersonic B 9. 275 < FlightLevel A 10. 275 < FlightLevel B 11. 1 < ABS (LateralPositionInDegrees A – LateralPositionInDegrees B)	1. "are separated" (A , B)

–Test Frame 32(4):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. ¬ (IsOutsideMNPSAirspace B) 6. FlightLevel B ≤ 275 7. ¬ (HavePartOfRouteInMNPSAirspace B) 8. 2 < ABS (LateralPositionInDegrees A – LateralPositionInDegrees B)	1. "are separated" (A , B)

–Test Frame 33(5):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. ¬ (IsOutsideMNPSAirspace A) 6. ¬ (IsSupersonic B) 7. ¬ (HavePartOfRouteInMNPSAirspace A) 8. 2 < ABS (LateralPositionInDegrees A – LateralPositionInDegrees B)	1. "are separated" (A , B)

–Test Frame 34(6):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. ¬ (IsOnRoute Routes1 B) 6. ¬ (IsOnRoute Routes2 B) 7. ¬ (IsSupersonic A) 8. ¬ (MeetMNPS B) 9. 2 < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B)	1. "are separated" (A , B)

–Test Frame 35(7):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. IsOutsideMNPSAirspace A 6. IsOutsideMNPSAirspace B 7. IsOnRoute Routes1 A 8. IsOnRoute Routes1 B 9. 1.5 < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B)	1. "are separated" (A , B)

–Test Frame 36(8):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. ¬ (IsOnRoute Routes1 B) 6. ¬ (IsOnRoute Routes2 A) 7. FlightLevel A ≤ 275 8. ¬ (MeetMNPS A) 9. 2 < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B)	1. "are separated" (A , B)

–Test Frame 37(1):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. RouteDeparture A = USA 7. RouteDestination A = Caribbean 8. RouteDeparture B = USA 9. RouteDestination B = Caribbean 10. IsWestOf55W A 11. IsWestOf55W B	1. "are separated" (A , B)

–Test Frame 38(2):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. RouteDestination A = USA 7. RouteDeparture A = Caribbean 8. RouteDestination B = USA 9. RouteDeparture B = Caribbean 10. IsWestOf55W A 11. IsWestOf55W B	1. "are separated" (A , B)

–Test Frame 39(3):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. RouteDeparture A = Caribbean 7. RouteDestination A = CAN 8. RouteDeparture B = Caribbean 9. RouteDestination B = CAN 10. IsWestOf55W A 11. IsWestOf55W B	1. "are separated" (A , B)

–Test Frame 40(4):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. RouteDeparture A = Caribbean 7. RouteDestination A = BDA 8. RouteDeparture B = Caribbean 9. RouteDestination B = BDA 10. IsWestOf55W A 11. IsWestOf55W B	1. "are separated" (A , B)

–Test Frame 41(5):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. RouteDestination A = Caribbean 7. RouteDeparture A = CAN 8. RouteDestination B = Caribbean 9. RouteDeparture B = CAN 10. IsWestOf55W A 11. IsWestOf55W B	1. "are separated" (A , B)

–Test Frame 42(6):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. RouteDestination A = Caribbean 7. RouteDeparture A = BDA 8. RouteDestination B = Caribbean 9. RouteDeparture B = BDA 10. IsWestOf55W A 11. IsWestOf55W B	1. "are separated" (A , B)

–Test Frame 43(1):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDeparture A = IberianPeninsula 6. RouteDestination A = Azores 7. RouteDeparture B = IberianPeninsula 8. RouteDestination B = Azores 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 44(2):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDestination A = IberianPeninsula 6. RouteDeparture A = Azores 7. RouteDestination B = IberianPeninsula 8. RouteDeparture B = Azores 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 45(3):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDeparture A = USA 6. RouteDestination A = BDA 7. RouteDeparture B = USA 8. RouteDestination B = BDA 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 46(4):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDeparture A = Iceland 6. RouteDestination A = Scandinavia 7. RouteDeparture B = Iceland 8. RouteDestination B = Scandinavia 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 47(5):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDestination A = USA 6. RouteDeparture A = BDA 7. RouteDestination B = USA 8. RouteDeparture B = BDA 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 48(6):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDestination A = Iceland 6. RouteDeparture A = Scandinavia 7. RouteDestination B = Iceland 8. RouteDeparture B = Scandinavia 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 49(7):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDeparture A = Iceland 6. RouteDestination A = UnitedKingdom 7. RouteDeparture B = Iceland 8. RouteDestination B = UnitedKingdom 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 50(8):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDestination A = Iceland 6. RouteDeparture A = UnitedKingdom 7. RouteDestination B = Iceland 8. RouteDeparture B = UnitedKingdom 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 51(9):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDeparture A = BDA 6. RouteDestination A = CAN 7. RouteDeparture B = BDA 8. RouteDestination B = CAN 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

–Test Frame 52(10):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDestination A = BDA 6. RouteDeparture A = CAN 7. RouteDestination B = BDA 8. RouteDeparture B = CAN 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B)	1. "are separated" (A , B)

C.1.3 Longitudinal Separation

–Test Frame 53(1):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 2. IsSupersonic A 3. IsSupersonic B 4. IsLevel A 5. IsLevel B 6. SameMachNumber (A , B) 7. "SameOr Diverging Tracks" (A , B) 8. 10 < ABS (TimeAtPosition A − TimeAtPosition B) 9. "Appropriate TimeSep AtCommon Point" (A , B)	1. "are separated" (A , B)

–Test Frame 54(2):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (IsTurbojet B)	
4. ¬ ("SameOr Diverging Tracks" (A , B))	
5. IsOnRoute Routes3 A	
6. IsOnRoute Routes3 B	
7. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 55(3):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)	1. "are separated" (A , B)
2. ¬ (IsSupersonic A)	
3. IsTurbojet A	
4. IsTurbojet B	
5. "separation check time" < StartTime ("turbojetOppDir NoLongSepPeriod" (A , B))	

–Test Frame 56(4):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. IsSupersonic A	
3. IsSupersonic B	
4. ReportedOverCommonPoint (A , B)	
5. SameType (A , B)	
6. InCruiseClimb A	
7. InCruiseClimb B	
8. "SameOr Diverging Tracks" (A , B)	
9. 10 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 57(5):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (ReportedOverCommonPoint (A , B))	
4. ¬ (IsTurbojet A)	
5. ¬ (IsOnRoute Routes3 B)	
6. 30 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 58(6):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. IsSupersonic A	
3. IsSupersonic B	
4. ¬ (SameMachNumber (A , B))	
5. ¬ (InCruiseClimb B)	
6. 15 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 59(7):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. IsSupersonic A	
3. IsSupersonic B	
4. ¬ (IsLevel B)	
5. ¬ (InCruiseClimb A)	
6. 15 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 60(8):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. IsSupersonic A	
3. IsSupersonic B	
4. ¬ (IsLevel A)	
5. ¬ (SameType (A , B))	
6. 15 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 61(9):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)	1. "are separated" (A , B)
2. ReportedOverCommonPoint (A , B)	
3. "separation check time" < ept (A , B)	
4. "separation check time" < StartTime ("turbojetOppDir NoLongSepPeriod" (A , B))	

–Test Frame 62(10):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)	1. "are separated" (A , B)
2. ¬ (ReportedOverCommonPoint (A , B))	
3. "separation check time" < ept (A , B) − 15	
4. "separation check time" < StartTime ("turbojetOppDir NoLongSepPeriod" (A , B))	

–Test Frame 63(11):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. EndTime ("turbojetOppDir NoLongSepPeriod" (A , B)) < "separation check time"	

–Test Frame 64(12):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. ¬ (IsTurbojet B) 4. ept (A , B) + 10 < "separation check time"	1. "are separated" (A , B)

–Test Frame 65(13):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (ReportedOverCommonPoint (A , B)) 3. ¬ (IsTurbojet B) 4. ept (A , B) + 15 < "separation check time"	1. "are separated" (A , B)

–Test Frame 66(14):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. "turbojetSameDir LongSep" (A , B) < ABS (TimeAtPosition A − TimeAtPosition B)	1. "are separated" (A , B)

–Test Frame 67(15):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 2. ¬ (IsSupersonic B) 3. ¬ (IsTurbojet B) 4. ¬ ("SameOr Diverging Tracks" (A , B)) 5. ¬ (IsOnRoute Routes3 A) 6. 30 < ABS (TimeAtPosition A − TimeAtPosition B)	1. "are separated" (A , B)

–Test Frame 68(16):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. IsSupersonic A	
3. IsSupersonic B	
4. ¬ (ReportedOverCommonPoint (A , B))	
5. ¬ ("Appropriate TimeSep AtCommon Point" (A , B))	
6. 15 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 69(1):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (IsTurbojet B)	
4. ¬ ("SameOr Diverging Tracks" (A , B))	
5. RouteDeparture A = USA	
6. RouteDestination A = Caribbean	
7. RouteDeparture B = USA	
8. RouteDestination B = Caribbean	
9. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 70(2):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (IsTurbojet B)	
4. ¬ ("SameOr Diverging Tracks" (A , B))	
5. RouteDeparture A = BDA	
6. RouteDestination A = USA	
7. RouteDeparture B = BDA	
8. RouteDestination B = USA	
9. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 71(3):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (IsTurbojet B)	
4. ¬ ("SameOr Diverging Tracks" (A , B))	
5. RouteDeparture A = Caribbean	
6. RouteDestination A = CAN	
7. RouteDeparture B = Caribbean	
8. RouteDestination B = CAN	
9. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 72(4):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (IsTurbojet B)	
4. ¬ ("SameOr Diverging Tracks" (A , B))	
5. RouteDeparture A = CAN	
6. RouteDestination A = BDA	
7. RouteDeparture B = CAN	
8. RouteDestination B = BDA	
9. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 73(1):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. EnterWATRSAirspaceAtSomeTime A 6. EnterWATRSAirspaceAtSomeTime B 7. IsWestOf60W A 8. IsWestOf60W B 9. MachTechniqueUsed A 10. MachTechniqueUsed B 11. OnPublishedRoute A 12. OnPublishedRoute B 13. "SameOr Diverging Tracks" (A , B) 14. ReportedOverCommonPoint (A , B) 15. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 16. "separation check time" < StartTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 74(2):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. EnterWATRSAirspaceAtSomeTime A 6. EnterWATRSAirspaceAtSomeTime B 7. MachTechniqueUsed A 8. MachTechniqueUsed B 9. OnPublishedRoute A 10. OnPublishedRoute B 11. "SameOr Diverging Tracks" (A , B) 12. InWATRSAirspace A 13. InWATRSAirspace B 14. ¬ (ReportedOverCommonPoint (A , B)) 15. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) − 15 16. "separation check time" < StartTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 75(3):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (IsWestOf60W B) 6. ¬ (InWATRSAirspace B) 7. ReportedOverCommonPoint (A , B) 8. "separation check time" < ept (A , B)	1. "are separated" (A , B)

–Test Frame 76(4):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (IsWestOf60W A) 6. ¬ (InWATRSAirspace A) 7. ¬ (ReportedOverCommonPoint (A , B)) 8. "separation check time" < ept (A , B) − 15	1. "are separated" (A , B)

–Test Frame 77(5):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ ("SameOr Diverging Tracks" (A , B)) 6. ReportedOverCommonPoint (A , B) 7. "separation check time" < ept (A , B)	1. "are separated" (A , B)

–Test Frame 78(6):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (OnPublishedRoute B) 6. ReportedOverCommonPoint (A , B) 7. "separation check time" < ept (A , B)	1. "are separated" (A , B)

–Test Frame 79(7):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (OnPublishedRoute A) 6. ReportedOverCommonPoint (A , B) 7. "separation check time" < ept (A , B)	1. "are separated" (A , B)

–Test Frame 80(8):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (MachTechniqueUsed B) 6. ReportedOverCommonPoint (A , B) 7. "separation check time" < ept (A , B)	1. "are separated" (A , B)

–Test Frame 81(9):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (MachTechniqueUsed A) 6. ReportedOverCommonPoint (A , B) 7. "separation check time" < ept (A , B)	1. "are separated" (A , B)

–Test Frame 82(10):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (EnterWATRSAirspaceAtSomeTime B) 6. ReportedOverCommonPoint (A , B) 7. "separation check time" < ept (A , B)	1. "are separated" (A , B)

–Test Frame 83(11):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (EnterWATRSAirspaceAtSomeTime A) 6. ReportedOverCommonPoint (A , B) 7. "separation check time" < ept (A , B)	1. "are separated" (A , B)

–Test Frame 84(12):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ReportedOverCommonPoint (A , B) 6. ept (A , B) ≤ StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 7. "separation check time" < ept (A , B)	1. "are separated" (A , B)

–Test Frame 85(13):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (ReportedOverCommonPoint (A , B)) 6. ept (A , B) − 15 ≤ StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 7. "separation check time" < ept (A , B) − 15	1. "are separated" (A , B)

–Test Frame 86(14):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (HavePartOfRouteInMNPSAirspace B) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ReportedOverCommonPoint (A , B) 16. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 17. "separation check time" < StartTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 87(15):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (HavePartOfRouteInMNPSAirspace A) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ReportedOverCommonPoint (A , B) 16. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 17. "separation check time" < StartTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 88(16):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (MeetMNPS B) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ReportedOverCommonPoint (A , B) 16. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 17. "separation check time" < StartTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 89(17):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic A) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (MeetMNPS A) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ReportedOverCommonPoint (A , B) 16. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 17. "separation check time" < StartTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 90(1):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. EnterWATRSAirspaceAtSomeTime A 6. EnterWATRSAirspaceAtSomeTime B 7. IsWestOf60W A 8. IsWestOf60W B 9. MachTechniqueUsed A 10. MachTechniqueUsed B 11. OnPublishedRoute A 12. OnPublishedRoute B 13. "SameOr Diverging Tracks" (A , B) 14. ReportedOverCommonPoint (A , B) 15. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 16. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < "separation check time"	1. "are separated" (A , B)

–Test Frame 91(2):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. EnterWATRSAirspaceAtSomeTime A 6. EnterWATRSAirspaceAtSomeTime B 7. MachTechniqueUsed A 8. MachTechniqueUsed B 9. OnPublishedRoute A 10. OnPublishedRoute B 11. "SameOr Diverging Tracks" (A , B) 12. InWATRSAirspace A 13. InWATRSAirspace B 14. ¬ (ReportedOverCommonPoint (A , B)) 15. ept (A , B) + 15 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 16. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < "separation check time"	1. "are separated" (A , B)

–Test Frame 92(3):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (IsWestOf60W B) 6. ¬ (InWATRSAirspace B) 7. ReportedOverCommonPoint (A , B) 8. ept (A , B) + 10 < "separation check time"	1. "are separated" (A , B)

–Test Frame 93(4):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (IsWestOf60W A) 6. ¬ (InWATRSAirspace A) 7. ¬ (ReportedOverCommonPoint (A , B)) 8. ept (A , B) + 15 < "separation check time"	1. "are separated" (A , B)

–Test Frame 94(5):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ ("SameOr Diverging Tracks" (A , B)) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time"	1. "are separated" (A , B)

–Test Frame 95(6):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (OnPublishedRoute B) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time"	1. "are separated" (A , B)

–Test Frame 96(7):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (OnPublishedRoute A) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time"	1. "are separated" (A , B)

–Test Frame 97(8):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (MachTechniqueUsed B) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time"	1. "are separated" (A , B)

–Test Frame 98(9):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (MachTechniqueUsed A) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time"	1. "are separated" (A , B)

–Test Frame 99(10):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (EnterWATRSAirspaceAtSomeTime B) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time"	1. "are separated" (A , B)

–Test Frame 100(11):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (EnterWATRSAirspaceAtSomeTime A) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time"	1. "are separated" (A , B)

–Test Frame 101(12):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ReportedOverCommonPoint (A , B) 6. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ ept (A , B) + 10 7. ept (A , B) + 10 < "separation check time"	1. "are separated" (A , B)

–Test Frame 102(13):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (ReportedOverCommonPoint (A , B)) 6. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ ept (A , B) + 15 7. ept (A , B) + 15 < "separation check time"	1. "are separated" (A , B)

–Test Frame 103(14):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (HavePartOfRouteInMNPSAirspace B) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ReportedOverCommonPoint (A , B) 16. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 17. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < "separation check time"	1. "are separated" (A , B)

–Test Frame 104(15):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (HavePartOfRouteInMNPSAirspace A) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ReportedOverCommonPoint (A , B) 16. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 17. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < "separation check time"	1. "are separated" (A , B)

–Test Frame 105(16):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (MeetMNPS B) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ReportedOverCommonPoint (A , B) 16. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 17. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < "separation check time"	1. "are separated" (A , B)

–Test Frame 106(17):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (MeetMNPS A) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ReportedOverCommonPoint (A , B) 16. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 17. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < "separation check time"	1. "are separated" (A , B)

–Test Frame 107(1):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (HavePartOfRouteInMNPSAirspace B)	
6. EnterWATRSAirspaceAtSomeTime A	
7. EnterWATRSAirspaceAtSomeTime B	
8. IsWestOf60W A	
9. IsWestOf60W B	
10. MachTechniqueUsed A	
11. MachTechniqueUsed B	
12. OnPublishedRoute A	
13. OnPublishedRoute B	
14. "SameOr Diverging Tracks" (A , B)	
15. ¬ (InCruiseClimb A)	
16. ¬ (InCruiseClimb B)	
17. "Appropriate TimeSep AtCommon Point" (A , B)	
18. Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B)) $\leq$ 0.6	
19. 0.3 < Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B))	
20. "WATRSSameDir LongSep" (A , B) < 10	
21. "WATRSSameDir LongSep" (A , B) < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 108(2):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. ¬ (IsWestOf60W B)	
10. ¬ (InWATRSAirspace B)	
11. InCruiseClimb A	
12. 10 < ABS (TimeAtPosition A − TimeAtPosition B)	
13. Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B)) ≤ 0.02	

–Test Frame 109(3):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. ¬ (IsWestOf60W A)	
10. "SameOr Diverging Tracks" (A , B)	
11. ¬ (InWATRSAirspace A)	
12. InCruiseClimb B	
13. "Appropriate TimeSep AtCommon Point" (A , B)	
14. Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B)) $\leq$ 0.03	
15. 0.02 $<$ Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B))	
16. 9 $<$ ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 110(4):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. ¬ (OnPublishedRoute B)	
10. "SameOr Diverging Tracks" (A , B)	
11. "Appropriate TimeSep AtCommon Point" (A , B)	
12. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.04	
13. 0.03 < Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
14. 8 < ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 111(5):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. ¬ (OnPublishedRoute A)	
10. "SameOr Diverging Tracks" (A , B)	
11. "Appropriate TimeSep AtCommon Point" (A , B)	
12. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.05	
13. 0.04 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
14. 7 $<$ ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 112(6):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (HavePartOfRouteInMNPSAirspace A)	
6. EnterWATRSAirspaceAtSomeTime A	
7. EnterWATRSAirspaceAtSomeTime B	
8. MachTechniqueUsed A	
9. MachTechniqueUsed B	
10. OnPublishedRoute A	
11. OnPublishedRoute B	
12. "SameOr Diverging Tracks" (A , B)	
13. InWATRSAirspace A	
14. InWATRSAirspace B	
15. ¬ ("Appropriate TimeSep AtCommon Point" (A , B))	
16. "WATRSSameDir LongSep" (A , B) < 20	
17. "WATRSSameDir LongSep" (A , B) < ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 113(7):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. ¬ (EnterWATRSAirspaceAtSomeTime B)	
10. "SameOr Diverging Tracks" (A , B)	
11. "Appropriate TimeSep AtCommon Point" (A , B)	
12. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.06	
13. 0.05 < Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
14. 6 < ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 114(8):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (MeetMNPS B)	
6. ¬ (MachTechniqueUsed B)	
7. ¬ (ReportedOverCommonPoint (A , B))	
8. 20 < ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 115(9):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (MeetMNPS A)	
6. ¬ (MachTechniqueUsed A)	
7. "SameOr Diverging Tracks" (A , B)	
8. ¬ (InCruiseClimb A)	
9. ¬ (InCruiseClimb B)	
10. ReportedOverCommonPoint (A , B)	
11. 15 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 116(10):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. ¬ (EnterWATRSAirspaceAtSomeTime A)	
10. "SameOr Diverging Tracks" (A , B)	
11. "Appropriate TimeSep AtCommon Point" (A , B)	
12. 0.6 < Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B))	
13. 5 < ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 117(11):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (HavePartOfRouteInMNPSAirspace B) 6. MachTechniqueUsed A 7. MachTechniqueUsed B 8. Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B)) ≤ 0.3 9. 20 ≤ "WATRSSameDir LongSep" (A , B) 10. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	1. "are separated" (A , B)

–Test Frame 118(12):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (HavePartOfRouteInMNPSAirspace B) 6. ¬ ("SameOr Diverging Tracks" (A , B)) 7. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	1. "are separated" (A , B)

–Test Frame 119(13):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (HavePartOfRouteInMNPSAirspace B)	
6. MachTechniqueUsed A	
7. MachTechniqueUsed B	
8. "SameOr Diverging Tracks" (A , B)	
9. ¬ (InCruiseClimb A)	
10. ¬ (InCruiseClimb B)	
11. "Appropriate TimeSep AtCommon Point" (A , B)	
12. 0.6 < Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
13. 5 ≤ "WATRSSameDir LongSep" (A , B)	
14. 5 < ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 120(14):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (HavePartOfRouteInMNPSAirspace B)	
6. EnterWATRSAirspaceAtSomeTime A	
7. EnterWATRSAirspaceAtSomeTime B	
8. IsWestOf60W A	
9. IsWestOf60W B	
10. MachTechniqueUsed A	
11. MachTechniqueUsed B	
12. OnPublishedRoute A	
13. OnPublishedRoute B	
14. "SameOr Diverging Tracks" (A , B)	
15. ¬ (InCruiseClimb A)	
16. ¬ (InCruiseClimb B)	
17. "Appropriate TimeSep AtCommon Point" (A , B)	
18. 0.6 < Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
19. "WATRSSameDir LongSep" (A , B) < 5	
20. "WATRSSameDir LongSep" (A , B) < ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 121(15):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (HavePartOfRouteInMNPSAirspace B)	
6. MachTechniqueUsed A	
7. MachTechniqueUsed B	
8. "SameOr Diverging Tracks" (A , B)	
9. ¬ (InCruiseClimb A)	
10. ¬ (InCruiseClimb B)	
11. "Appropriate TimeSep AtCommon Point" (A , B)	
12. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.6	
13. 0.3 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
14. 10 $\leq$ "WATRSSameDir LongSep" (A , B)	
15. 10 $<$ ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 122(16):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. MinAll (A , B) < ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 123(17):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. ¬ (MachTechniqueUsed B)	
10. "SameOr Diverging Tracks" (A , B)	
11. "Appropriate TimeSep AtCommon Point" (A , B)	
12. 5 < ABS (TimeAtPosition A − TimeAtPosition B)	
13. 0.06 < Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B))	

–Test Frame 124(1):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.03	
20. 0.02 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. "WATRSSameDir LongSep" (A , B) $\leq$ 9	
22. "WATRSSameDir LongSep" (A , B) $<$ ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 125(2):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.02	
19. 10 < "WATRSSameDir LongSep" (A , B)	
20. 10 < ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 126(3):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.04	
20. 0.03 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. 8 $<$ "WATRSSameDir LongSep" (A , B)	
22. 8 $<$ ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 127(4):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. ¬ (InCruiseClimb A)	
20. ¬ (InCruiseClimb B)	
21. 0.6 < Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B))	
22. 5 < ABS (TimeAtPosition A − TimeAtPosition B)	
23. "WATRSSameDir LongSep" (A , B) ≤ 5	
24. 5 ≤ "WATRSSameDir LongSep" (A , B)	

–Test Frame 128(5):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.05	
20. 0.04 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. 7 $<$ "WATRSSameDir LongSep" (A , B)	
22. 7 $<$ ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 129(6):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.06	
20. 0.05 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. 6 $<$ "WATRSSameDir LongSep" (A , B)	
22. 6 $<$ ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 130(7):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. 0.06 < Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
20. 5 < "WATRSSameDir LongSep" (A , B)	
21. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) ≤ 0.3	
22. 5 < ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 131(8):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. ¬ ("Appropriate TimeSep AtCommon Point" (A , B))	
19. "WATRSSameDir LongSep" (A , B) $\leq$ 10	
20. "WATRSSameDir LongSep" (A , B) $<$ ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 132(9):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.06	
20. 0.05 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. InCruiseClimb A	
22. "WATRSSameDir LongSep" (A , B) $\leq$ 6	
23. "WATRSSameDir LongSep" (A , B) $<$ ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 133(10):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.05	
20. 0.04 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. InCruiseClimb B	
22. "WATRSSameDir LongSep" (A , B) $\leq$ 7	
23. "WATRSSameDir LongSep" (A , B) $<$ ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 134(11):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. ¬ (InCruiseClimb A)	
20. ¬ (InCruiseClimb B)	
21. Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B)) $\leq$ 0.6	
22. 0.3 $<$ Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B))	
23. "WATRSSameDir LongSep" (A , B) $\leq$ 5	
24. "WATRSSameDir LongSep" (A , B) $<$ ABS (TimeAtPosition A − TimeAtPosition B)	

–Test Frame 135(12):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.04	
20. 0.03 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. InCruiseClimb A	
22. "WATRSSameDir LongSep" (A , B) $\leq$ 8	
23. "WATRSSameDir LongSep" (A , B) $<$ ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 136(13):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.03	
20. 0.02 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. 9 $<$ "WATRSSameDir LongSep" (A , B)	
22. InCruiseClimb A	
23. 9 $<$ ABS (TimeAtPosition A – TimeAtPosition B)	

–Test Frame 137(14):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. ¬ (InCruiseClimb A)	
20. ¬ (InCruiseClimb B)	
21. 0.6 < Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B))	
22. "WATRSSameDir LongSep" (A , B) < 5	
23. "WATRSSameDir LongSep" (A , B) < ABS (TimeAtPosition A − TimeAtPosition B)	

C.2 Test Frames for "Separation Does Not Exist"

–Test Frame 138(1) :

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

C.2.1 Vertical Separation

–Test Frame 139(1):

Stimuli	Response
1. 450 < FlightLevel A 2. 450 < FlightLevel B 3. IsSupersonic A 4. ABS (FlightLevel A − FlightLevel B) ≤ 4000 5. ¬ (LaterallySeparated (A , B)) 6. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 140(2):

Stimuli	Response
1. 280 < FlightLevel A 2. 280 < FlightLevel B 3. ¬ (IsSupersonic A) 4. ¬ (IsSupersonic B) 5. ABS (FlightLevel A − FlightLevel B) ≤ 2000 6. ¬ (LaterallySeparated (A , B)) 7. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 141(3):

Stimuli	Response
1. FlightLevel A ≤ 280 2. ABS (FlightLevel A − FlightLevel B) ≤ 1000 3. ¬ (LaterallySeparated (A , B)) 4. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 142(4):

Stimuli	Response
1. ABS (FlightLevel A − FlightLevel B) ≤ 1000 2. 280 < FlightLevel A 3. FlightLevel B ≤ 280 4. ¬ (LaterallySeparated (A , B)) 5. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 143(5):

Stimuli	Response
1. 280 < FlightLevel A 2. 280 < FlightLevel B 3. FlightLevel A ≤ 450 4. ABS (FlightLevel A − FlightLevel B) ≤ 2000 5. ¬ (LaterallySeparated (A , B)) 6. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 144(6):

Stimuli	Response
1. 280 < FlightLevel A 2. 280 < FlightLevel B 3. FlightLevel B ≤ 450 4. ABS (FlightLevel A − FlightLevel B) ≤ 2000 5. ¬ (LaterallySeparated (A , B)) 6. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 145(7):

Stimuli	Response
1. 450 < FlightLevel A 2. 450 < FlightLevel B 3. ABS (FlightLevel A − FlightLevel B) ≤ 4000 4. IsSupersonic B 5. ¬ (LaterallySeparated (A , B)) 6. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

C.2.2 Lateral Separation

–Test Frame 146(1):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B))	1. ¬ ("are separated" (A , B))
2. 80 < "RouteSegment Degrees" A	
3. 80 < "RouteSegment Degrees" B	
4. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ "LateralSeparation RequiredInMiles" (A , B)	
5. ¬ (LongitudinallySeparated (A , B))	

–Test Frame 147(2):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B))	1. ¬ ("are separated" (A , B))
2. 70 ≤ "RouteSegment Degrees" A	
3. "RouteSegment Degrees" A ≤ 80	
4. "LatChange Per10DLong LessThanOrEq1" A	
5. "LatChange Per10DLong LessThanOrEq1" B	
6. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ "LateralSeparation RequiredInDegrees" (A , B)	
7. ¬ (LongitudinallySeparated (A , B))	

–Test Frame 148(3):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B))	1. ¬ ("are separated" (A , B))
2. 58 < "RouteSegment Degrees" A	
3. "RouteSegment Degrees" A < 70	
4. ¬ ("LatChange Per10DLong LessThanOrEq2" B)	
5. 58 < "RouteSegment Degrees" B	
6. "RouteSegment Degrees" B < 70	
7. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ "LateralSeparation RequiredInMiles" (A , B)	
8. ¬ (LongitudinallySeparated (A , B))	

–Test Frame 149(4):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. "RouteSegment Degrees" A ≤ 58 3. ¬ ("LatChange Per10DLong LessThanOrEq3" B) 4. "RouteSegment Degrees" B ≤ 58 5. ABS (LateralPositionInMiles A – LateralPositionInMiles B) ≤ "LateralSeparation RequiredInMiles" (A , B) 6. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 150(5):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ ("LatChange Per10DLong LessThanOrEq3" A) 3. ¬ ("LatChange Per10DLong LessThanOrEq1" B) 4. ABS (LateralPositionInMiles A – LateralPositionInMiles B) ≤ "LateralSeparation RequiredInMiles" (A , B) 5. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 151(6):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. "RouteSegment Degrees" A ≤ 58 3. "LatChange Per10DLong LessThanOrEq3" A 4. "LatChange Per10DLong LessThanOrEq3" B 5. ABS (LateralPositionInDegrees A – LateralPositionInDegrees B) ≤ "LateralSeparation RequiredInDegrees" (A , B) 6. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 152(7):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. "LatChange Per10DLong LessThanOrEq1" A 3. "LatChange Per10DLong LessThanOrEq1" B 4. 70 ≤ "RouteSegment Degrees" B 5. "RouteSegment Degrees" B ≤ 80 6. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ "LateralSeparation RequiredInDegrees" (A , B) 7. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 153(8):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 58 < "RouteSegment Degrees" A 3. "RouteSegment Degrees" A < 70 4. "LatChange Per10DLong LessThanOrEq2" A 5. "LatChange Per10DLong LessThanOrEq2" B 6. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ "LateralSeparation RequiredInDegrees" (A , B) 7. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 154(9):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ ("LatChange Per10DLong LessThanOrEq3" B) 3. ¬ ("LatChange Per10DLong LessThanOrEq2" A) 4. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ "LateralSeparation RequiredInMiles" (A , B) 5. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 155(10):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ ("LatChange Per10DLong LessThanOrEq3" B) 3. ¬ ("LatChange Per10DLong LessThanOrEq1" A) 4. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ "LateralSeparation RequiredInMiles" (A , B) 5. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 156(1):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. ¬ (IsOnRoute Routes1 B) 5. ¬ (IsWestOf55W B) 6. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ 60 7. FlightLevel A ≤ 275 8. MeetMNPS A 9. MeetMNPS B 10. HavePartOfRouteInMNPSAirspace A 11. HavePartOfRouteInMNPSAirspace B 12. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 157(2):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. IsOutsideMNPSAirspace A 5. IsOutsideMNPSAirspace B 6. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ 90 7. IsOnRoute Routes2 A 8. IsOnRoute Routes2 B 9. IsWestOf55W A 10. IsWestOf55W B 11. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 158(3):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. ¬ (IsOnRoute Routes1 A) 5. ¬ (IsWestOf55W A) 6. IsSupersonic A 7. IsSupersonic B 8. 275 < FlightLevel A 9. 275 < FlightLevel B 10. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ 60 11. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 159(4):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. ¬ (IsOutsideMNPSAirspace B) 5. FlightLevel B ≤ 275 6. ¬ (HavePartOfRouteInMNPSAirspace B) 7. ABS (LateralPositionInMiles A – LateralPositionInMiles B) ≤ 120 8. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 160(5):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. ¬ (IsOutsideMNPSAirspace A) 5. ¬ (IsSupersonic B) 6. ¬ (HavePartOfRouteInMNPSAirspace A) 7. ABS (LateralPositionInMiles A – LateralPositionInMiles B) ≤ 120 8. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 161(6):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. ¬ (IsOnRoute Routes1 B) 5. ¬ (IsOnRoute Routes2 B) 6. ¬ (IsSupersonic A) 7. ¬ (MeetMNPS B) 8. ABS (LateralPositionInMiles A – LateralPositionInMiles B) ≤ 120 9. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 162(7):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. IsOutsideMNPSAirspace A 5. IsOutsideMNPSAirspace B 6. IsOnRoute Routes1 A 7. IsOnRoute Routes1 B 8. ABS (LateralPositionInMiles A – LateralPositionInMiles B) ≤ 90 9. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 163(8):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. ¬ (IsOnRoute Routes1 B) 5. ¬ (IsOnRoute Routes2 A) 6. FlightLevel A ≤ 275 7. ¬ (MeetMNPS A) 8. ABS (LateralPositionInMiles A – LateralPositionInMiles B) ≤ 120 9. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 164(1):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 70 ≤ "RouteSegment Degrees" A 3. "RouteSegment Degrees" A ≤ 80 4. "LatChange Per10DLong LessThanOrEq1" A 5. "LatChange Per10DLong LessThanOrEq1" B 6. ¬ (IsOnRoute Routes1 B) 7. ¬ (IsWestOf55W B) 8. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 1 9. FlightLevel A ≤ 275 10. MeetMNPS A 11. MeetMNPS B 12. HavePartOfRouteInMNPSAirspace A 13. HavePartOfRouteInMNPSAirspace B 14. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 165(2):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 70 ≤ "RouteSegment Degrees" A 3. "RouteSegment Degrees" A ≤ 80 4. "LatChange Per10DLong LessThanOrEq1" A 5. "LatChange Per10DLong LessThanOrEq1" B 6. IsOutsideMNPSAirspace A 7. IsOutsideMNPSAirspace B 8. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 1.5 9. IsOnRoute Routes2 A 10. IsOnRoute Routes2 B 11. IsWestOf55W A 12. IsWestOf55W B 13. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 166(3):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 70 ≤ "RouteSegment Degrees" A 3. "RouteSegment Degrees" A ≤ 80 4. "LatChange Per10DLong LessThanOrEq1" A 5. "LatChange Per10DLong LessThanOrEq1" B 6. ¬ (IsOnRoute Routes1 A) 7. ¬ (IsWestOf55W A) 8. IsSupersonic A 9. IsSupersonic B 10. 275 < FlightLevel A 11. 275 < FlightLevel B 12. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 1 13. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 167(4):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 70 ≤ "RouteSegment Degrees" A 3. "RouteSegment Degrees" A ≤ 80 4. "LatChange Per10DLong LessThanOrEq1" A 5. "LatChange Per10DLong LessThanOrEq1" B 6. ¬ (IsOutsideMNPSAirspace B) 7. FlightLevel B ≤ 275 8. ¬ (HavePartOfRouteInMNPSAirspace B) 9. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 2 10. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 168(5):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 70 ≤ "RouteSegment Degrees" A 3. "RouteSegment Degrees" A ≤ 80 4. "LatChange Per10DLong LessThanOrEq1" A 5. "LatChange Per10DLong LessThanOrEq1" B 6. ¬ (IsOutsideMNPSAirspace A) 7. ¬ (IsSupersonic B) 8. ¬ (HavePartOfRouteInMNPSAirspace A) 9. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 2 10. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 169(6):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 70 ≤ "RouteSegment Degrees" A 3. "RouteSegment Degrees" A ≤ 80 4. "LatChange Per10DLong LessThanOrEq1" A 5. "LatChange Per10DLong LessThanOrEq1" B 6. ¬ (IsOnRoute Routes1 B) 7. ¬ (IsOnRoute Routes2 B) 8. ¬ (IsSupersonic A) 9. ¬ (MeetMNPS B) 10. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 2 11. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 170(7):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 70 ≤ "RouteSegment Degrees" A 3. "RouteSegment Degrees" A ≤ 80 4. "LatChange Per10DLong LessThanOrEq1" A 5. "LatChange Per10DLong LessThanOrEq1" B 6. IsOutsideMNPSAirspace A 7. IsOutsideMNPSAirspace B 8. IsOnRoute Routes1 A 9. IsOnRoute Routes1 B 10. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 1.5 11. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 171(8):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 70 ≤ "RouteSegment Degrees" A 3. "RouteSegment Degrees" A ≤ 80 4. "LatChange Per10DLong LessThanOrEq1" A 5. "LatChange Per10DLong LessThanOrEq1" B 6. ¬ (IsOnRoute Routes1 B) 7. ¬ (IsOnRoute Routes2 A) 8. FlightLevel A ≤ 275 9. ¬ (MeetMNPS A) 10. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 2 11. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

C.2.3 Longitudinal Separation

–Test Frame 172(1):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. IsSupersonic A 5. IsSupersonic B 6. IsLevel A 7. IsLevel B 8. SameMachNumber (A , B) 9. "SameOr Diverging Tracks" (A , B) 10. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 10 11. "Appropriate TimeSep AtCommon Point" (A , B)	1. ¬ ("are separated" (A , B))

–Test Frame 173(2):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 4. ¬ (IsSupersonic B) 5. IsTurbojet A 6. IsTurbojet B 7. StartTime ("turbojetOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time" 8. "separation check time" ≤ EndTime ("turbojetOppDir NoLongSepPeriod" (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 174(3):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. ¬ (IsSupersonic A) 5. ¬ (IsTurbojet B) 6. ¬ ("SameOr Diverging Tracks" (A , B)) 7. IsOnRoute Routes3 A 8. IsOnRoute Routes3 B 9. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 20	1. ¬ ("are separated" (A , B))

–Test Frame 175(4):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 4. ReportedOverCommonPoint (A , B) 5. ept (A , B) ≤ "separation check time" 6. ¬ (IsTurbojet A) 7. "separation check time" ≤ ept (A , B) + 10	1. ¬ ("are separated" (A , B))

–Test Frame 176(5):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 4. ¬ (ReportedOverCommonPoint (A , B)) 5. ept (A , B) − 15 ≤ "separation check time" 6. ¬ (IsTurbojet B) 7. "separation check time" ≤ ept (A , B) + 15	1. ¬ ("are separated" (A , B))

–Test Frame 177(6):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. IsSupersonic A 5. IsSupersonic B 6. SameType (A , B) 7. InCruiseClimb A 8. InCruiseClimb B 9. "SameOr Diverging Tracks" (A , B) 10. ABS (TimeAtPosition A − TimeAtPosition B) $\leq$ 10 11. "Appropriate TimeSep AtCommon Point" (A , B)	1. ¬ ("are separated" (A , B))

–Test Frame 178(7):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. IsSupersonic A 5. IsSupersonic B 6. ¬ (SameMachNumber (A , B)) 7. ¬ (InCruiseClimb B) 8. ABS (TimeAtPosition A − TimeAtPosition B) $\leq$ 15	1. ¬ ("are separated" (A , B))

–Test Frame 179(8):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. IsSupersonic A 5. IsSupersonic B 6. ¬ (IsLevel B) 7. ¬ (InCruiseClimb A) 8. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 15	1. ¬ ("are separated" (A , B))

–Test Frame 180(9):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. IsSupersonic A 5. IsSupersonic B 6. ¬ (IsLevel A) 7. ¬ (SameType (A , B)) 8. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 15	1. ¬ ("are separated" (A , B))

–Test Frame 181(10):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. ¬ (IsSupersonic B) 5. ¬ (IsTurbojet B) 6. ¬ ("SameOr Diverging Tracks" (A , B)) 7. ¬ (IsOnRoute Routes3 B) 8. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 30	1. ¬ ("are separated" (A , B))

–Test Frame 182(11):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. ¬ (IsSupersonic B) 5. IsTurbojet A 6. IsTurbojet B 7. ABS (TimeAtPosition A − TimeAtPosition B) ≤ "turbojetSameDir LongSep" (A , B)	1. ¬ ("are separated" (A , B))

–Test Frame 183(12):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. ¬ (IsSupersonic B) 5. ¬ (IsTurbojet B) 6. ¬ ("SameOr Diverging Tracks" (A , B)) 7. ¬ (IsOnRoute Routes3 A) 8. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 30	1. ¬ ("are separated" (A , B))

–Test Frame 184(13):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. IsSupersonic A 5. IsSupersonic B 6. ¬ (ReportedOverCommonPoint (A , B)) 7. ¬ ("Appropriate TimeSep AtCommon Point" (A , B)) 8. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 15	1. ¬ ("are separated" (A , B))

D Differentiated Test Frames

The test frames in this appendix were generated in a manner similar to those of Appendix C.

This appendix contains differentiated test frames. For this specification, the differentiated test frames are only slightly different from the base test frames. This is due to the table structure from which the S specification was generated.

In some interations, some of the test frames were found to be redundant. This occurs when the stimuli for two or more test frames subsume the stimuli of another. In this appendix, 161 of the 176 test frames do not contain non-primitives and can be used to derive test steps.

D.1 Test Frames for "Separation Exists"

–Test Frame 1(1):

Stimuli	Response
1. VerticallySeparated (A , B) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (LongitudinallySeparated (A , B))	1. "are separated" (A , B)

–Test Frame 2(2):

Stimuli	Response
1. LaterallySeparated (A , B) 2. ¬ (VerticallySeparated (A , B)) 3. ¬ (LongitudinallySeparated (A , B))	1. "are separated" (A , B)

–Test Frame 3(3):

Stimuli	Response
1. LongitudinallySeparated (A , B) 2. ¬ (VerticallySeparated (A , B)) 3. ¬ (LaterallySeparated (A , B))	1. "are separated" (A , B)

D.1.1 Vertical Separation

–Test Frame 4(1):

Stimuli	Response
1. 450 < FlightLevel A 2. 450 < FlightLevel B 3. IsSupersonic A 4. 4000 < ABS (FlightLevel A − FlightLevel B) 5. ¬ (LaterallySeparated (A , B)) 6. ¬ (LongitudinallySeparated (A , B)) 7. ¬ (IsSupersonic B)	1. "are separated" (A , B)

–Test Frame 5(2):

Stimuli	Response
1. ¬ (IsSupersonic A) 2. ¬ (IsSupersonic B) 3. 2000 < ABS (FlightLevel A − FlightLevel B) 4. ¬ (LaterallySeparated (A , B)) 5. ¬ (LongitudinallySeparated (A , B)) 6. 450 < FlightLevel A 7. 450 < FlightLevel B	1. "are separated" (A , B)

–Test Frame 6(3):

Stimuli	Response
1. FlightLevel A ≤ 280 2. 1000 < ABS (FlightLevel A − FlightLevel B) 3. ¬ (LaterallySeparated (A , B)) 4. ¬ (LongitudinallySeparated (A , B))	1. "are separated" (A , B)

–Test Frame 7(4):

Stimuli	Response
1. 1000 < ABS (FlightLevel A − FlightLevel B) 2. 280 < FlightLevel A 3. FlightLevel B ≤ 280 4. ¬ (LaterallySeparated (A , B)) 5. ¬ (LongitudinallySeparated (A , B))	1. "are separated" (A , B)

–Test Frame 8(5):

Stimuli	Response
1. 280 < FlightLevel A 2. FlightLevel A ≤ 450 3. 2000 < ABS (FlightLevel A − FlightLevel B) 4. ¬ (LaterallySeparated (A , B)) 5. ¬ (LongitudinallySeparated (A , B)) 6. 450 < FlightLevel B 7. IsSupersonic A	1. "are separated" (A , B)

–Test Frame 9(6):

Stimuli	Response
1. 280 < FlightLevel B 2. FlightLevel B ≤ 450 3. 2000 < ABS (FlightLevel A − FlightLevel B) 4. ¬ (LaterallySeparated (A , B)) 5. ¬ (LongitudinallySeparated (A , B)) 6. 450 < FlightLevel A 7. IsSupersonic A	1. "are separated" (A , B)

–Test Frame 10(7):

Stimuli	Response
1. 450 < FlightLevel A 2. 450 < FlightLevel B 3. 4000 < ABS (FlightLevel A − FlightLevel B) 4. IsSupersonic B 5. ¬ (LaterallySeparated (A , B)) 6. ¬ (LongitudinallySeparated (A , B)) 7. ¬ (IsSupersonic A)	1. "are separated" (A , B)

D.1.2 Lateral Separation

–Test Frame 11(1):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. "LateralSeparation RequiredInMiles" (A , B) < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 4. ¬ (VerticallySeparated (A , B)) 5. ¬ (LongitudinallySeparated (A , B)) 6. "LatChange Per10DLong LessThanOrEq3" A 7. "LatChange Per10DLong LessThanOrEq3" B	1. "are separated" (A , B)

–Test Frame 12(2):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. "LateralSeparation RequiredInDegrees" (A , B) < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) 6. ¬ (VerticallySeparated (A , B)) 7. ¬ (LongitudinallySeparated (A , B)) 8. "RouteSegment Degrees" B < 70	1. "are separated" (A , B)

–Test Frame 13(3):

Stimuli	Response
1. 58 < "RouteSegment Degrees" A 2. "RouteSegment Degrees" A < 70 3. ¬ ("LatChange Per10DLong LessThanOrEq2" B) 4. 58 < "RouteSegment Degrees" B 5. "RouteSegment Degrees" B < 70 6. "LateralSeparation RequiredInMiles" (A , B) < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 7. ¬ (VerticallySeparated (A , B)) 8. ¬ (LongitudinallySeparated (A , B)) 9. "LatChange Per10DLong LessThanOrEq1" A	1. "are separated" (A , B)

–Test Frame 14(4):

Stimuli	Response
1. "RouteSegment Degrees" A ≤ 58 2. ¬ ("LatChange Per10DLong LessThanOrEq3" B) 3. "RouteSegment Degrees" B ≤ 58 4. "LateralSeparation RequiredInMiles" (A , B) < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LongitudinallySeparated (A , B)) 7. "LatChange Per10DLong LessThanOrEq1" A	1. "are separated" (A , B)

–Test Frame 15(5):

Stimuli	Response
1. ¬ ("LatChange Per10DLong LessThanOrEq3" A) 2. ¬ ("LatChange Per10DLong LessThanOrEq1" B) 3. "LateralSeparation RequiredInMiles" (A , B) < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 4. ¬ (VerticallySeparated (A , B)) 5. ¬ (LongitudinallySeparated (A , B)) 6. "RouteSegment Degrees" A ≤ 58 7. 58 < "RouteSegment Degrees" B 8. "LatChange Per10DLong LessThanOrEq1" A	1. "are separated" (A , B)

–Test Frame 16(6):

Stimuli	Response
1. "RouteSegment Degrees" A ≤ 58 2. "LatChange Per10DLong LessThanOrEq3" A 3. "LatChange Per10DLong LessThanOrEq3" B 4. "LateralSeparation RequiredInDegrees" (A , B) < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LongitudinallySeparated (A , B)) 7. "RouteSegment Degrees" B < 70	1. "are separated" (A , B)

–Test Frame 17(7):

Stimuli	Response
1. "LatChange Per10DLong LessThanOrEq1" A 2. "LatChange Per10DLong LessThanOrEq1" B 3. 70 $\leq$ "RouteSegment Degrees" B 4. "RouteSegment Degrees" B $\leq$ 80 5. "LateralSeparation RequiredInDegrees" (A , B) < ABS (LateralPositionInDegrees A – LateralPositionInDegrees B) 6. ¬ (VerticallySeparated (A , B)) 7. ¬ (LongitudinallySeparated (A , B)) 8. "RouteSegment Degrees" A $\leq$ 58 9. ¬ ("LatChange Per10DLong LessThanOrEq3" B)	1. "are separated" (A , B)

–Test Frame 18(8):

Stimuli	Response
1. 58 < "RouteSegment Degrees" A 2. "RouteSegment Degrees" A < 70 3. "LatChange Per10DLong LessThanOrEq2" A 4. "LatChange Per10DLong LessThanOrEq2" B 5. "LateralSeparation RequiredInDegrees" (A , B) < ABS (LateralPositionInDegrees A – LateralPositionInDegrees B) 6. ¬ (VerticallySeparated (A , B)) 7. ¬ (LongitudinallySeparated (A , B)) 8. "RouteSegment Degrees" B < 70	1. "are separated" (A , B)

–Test Frame 19(9):

Stimuli	Response
1. ¬ ("LatChange Per10DLong LessThanOrEq3" B) 2. ¬ ("LatChange Per10DLong LessThanOrEq2" A) 3. "LateralSeparation RequiredInMiles" (A , B) < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 4. ¬ (VerticallySeparated (A , B)) 5. ¬ (LongitudinallySeparated (A , B)) 6. "RouteSegment Degrees" A ≤ 58 7. "LatChange Per10DLong LessThanOrEq1" B	1. "are separated" (A , B)

–Test Frame 20(1):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. ¬ (IsOnRoute Routes1 B) 4. ¬ (IsWestOf55W B) 5. 60 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. FlightLevel A ≤ 275 7. MeetMNPS A 8. MeetMNPS B 9. HavePartOfRouteInMNPSAirspace A 10. HavePartOfRouteInMNPSAirspace B 11. ¬ (VerticallySeparated (A , B)) 12. ¬ (LongitudinallySeparated (A , B)) 13. "LatChange Per10DLong LessThanOrEq3" A 14. "LatChange Per10DLong LessThanOrEq3" B	1. "are separated" (A , B)

–Test Frame 21(2):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. IsOnRoute Routes2 A 7. IsOnRoute Routes2 B 8. IsWestOf55W A 9. IsWestOf55W B 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B	1. "are separated" (A , B)

–Test Frame 22(3):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. ¬ (IsOnRoute Routes1 A) 4. ¬ (IsWestOf55W A) 5. IsSupersonic A 6. IsSupersonic B 7. 275 < FlightLevel A 8. 275 < FlightLevel B 9. 60 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B	1. "are separated" (A , B)

–Test Frame 23(4):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. ¬ (IsOutsideMNPSAirspace B) 4. FlightLevel B ≤ 275 5. ¬ (HavePartOfRouteInMNPSAirspace B) 6. 120 < ABS (LateralPositionInMiles A – LateralPositionInMiles B) 7. ¬ (VerticallySeparated (A , B)) 8. ¬ (LongitudinallySeparated (A , B)) 9. "LatChange Per10DLong LessThanOrEq3" A 10. "LatChange Per10DLong LessThanOrEq3" B 11. IsOutsideMNPSAirspace A 12. IsOnRoute Routes1 B	1. "are separated" (A , B)

–Test Frame 24(5):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. ¬ (IsOutsideMNPSAirspace A) 4. ¬ (IsSupersonic B) 5. ¬ (HavePartOfRouteInMNPSAirspace A) 6. 120 < ABS (LateralPositionInMiles A – LateralPositionInMiles B) 7. ¬ (VerticallySeparated (A , B)) 8. ¬ (LongitudinallySeparated (A , B)) 9. "LatChange Per10DLong LessThanOrEq3" A 10. "LatChange Per10DLong LessThanOrEq3" B 11. IsOutsideMNPSAirspace B 12. IsOnRoute Routes1 B	1. "are separated" (A , B)

–Test Frame 25(6):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. ¬ (IsOnRoute Routes1 B) 4. ¬ (IsOnRoute Routes2 B) 5. ¬ (IsSupersonic A) 6. ¬ (MeetMNPS B) 7. 120 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 8. ¬ (VerticallySeparated (A , B)) 9. ¬ (LongitudinallySeparated (A , B)) 10. "LatChange Per10DLong LessThanOrEq3" A 11. "LatChange Per10DLong LessThanOrEq3" B 12. IsOutsideMNPSAirspace A 13. IsOutsideMNPSAirspace B 14. IsOnRoute Routes2 A	1. "are separated" (A , B)

–Test Frame 26(7):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. IsOnRoute Routes1 A 6. IsOnRoute Routes1 B 7. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 8. ¬ (VerticallySeparated (A , B)) 9. ¬ (LongitudinallySeparated (A , B)) 10. "LatChange Per10DLong LessThanOrEq3" A 11. "LatChange Per10DLong LessThanOrEq3" B 12. ¬ (IsWestOf55W B)	1. "are separated" (A , B)

–Test Frame 27(8):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. ¬ (IsOnRoute Routes2 A) 4. FlightLevel A ≤ 275 5. ¬ (MeetMNPS A) 6. 120 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 7. ¬ (VerticallySeparated (A , B)) 8. ¬ (LongitudinallySeparated (A , B)) 9. "LatChange Per10DLong LessThanOrEq3" A 10. "LatChange Per10DLong LessThanOrEq3" B 11. IsOutsideMNPSAirspace A 12. IsOutsideMNPSAirspace B 13. IsOnRoute Routes2 B	1. "are separated" (A , B)

–Test Frame 28(1):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. ¬ (IsOnRoute Routes1 B) 6. ¬ (IsWestOf55W B) 7. 1 < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) 8. FlightLevel A ≤ 275 9. MeetMNPS A 10. MeetMNPS B 11. HavePartOfRouteInMNPSAirspace A 12. HavePartOfRouteInMNPSAirspace B 13. ¬ (VerticallySeparated (A , B)) 14. ¬ (LongitudinallySeparated (A , B)) 15. "RouteSegment Degrees" B < 70	1. "are separated" (A , B)

–Test Frame 29(2):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. IsOutsideMNPSAirspace A 6. IsOutsideMNPSAirspace B 7. 1.5 < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) 8. IsOnRoute Routes2 A 9. IsOnRoute Routes2 B 10. IsWestOf55W A 11. IsWestOf55W B 12. ¬ (VerticallySeparated (A , B)) 13. ¬ (LongitudinallySeparated (A , B)) 14. "RouteSegment Degrees" B < 70	1. "are separated" (A , B)

–Test Frame 30(3):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. ¬ (IsOnRoute Routes1 A) 6. ¬ (IsWestOf55W A) 7. IsSupersonic A 8. IsSupersonic B 9. 275 < FlightLevel A 10. 275 < FlightLevel B 11. 1 < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) 12. ¬ (VerticallySeparated (A , B)) 13. ¬ (LongitudinallySeparated (A , B)) 14. "RouteSegment Degrees" B < 70	1. "are separated" (A , B)

–Test Frame 31(4):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. ¬ (IsOutsideMNPSAirspace B) 6. FlightLevel B ≤ 275 7. ¬ (HavePartOfRouteInMNPSAirspace B) 8. 2 < ABS (LateralPositionInDegrees A – LateralPositionInDegrees B) 9. ¬ (VerticallySeparated (A , B)) 10. ¬ (LongitudinallySeparated (A , B)) 11. "RouteSegment Degrees" B < 70 12. IsOutsideMNPSAirspace A 13. IsOnRoute Routes1 B	1. "are separated" (A , B)

–Test Frame 32(5):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. ¬ (IsOutsideMNPSAirspace A) 6. ¬ (IsSupersonic B) 7. ¬ (HavePartOfRouteInMNPSAirspace A) 8. 2 < ABS (LateralPositionInDegrees A – LateralPositionInDegrees B) 9. ¬ (VerticallySeparated (A , B)) 10. ¬ (LongitudinallySeparated (A , B)) 11. "RouteSegment Degrees" B < 70 12. IsOutsideMNPSAirspace B 13. IsOnRoute Routes1 B	1. "are separated" (A , B)

–Test Frame 33(6):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. ¬ (IsOnRoute Routes1 B) 6. ¬ (IsOnRoute Routes2 B) 7. ¬ (IsSupersonic A) 8. ¬ (MeetMNPS B) 9. 2 < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "RouteSegment Degrees" B < 70 13. IsOutsideMNPSAirspace A 14. IsOutsideMNPSAirspace B 15. IsOnRoute Routes2 A	1. "are separated" (A , B)

–Test Frame 34(7):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. IsOutsideMNPSAirspace A 6. IsOutsideMNPSAirspace B 7. IsOnRoute Routes1 A 8. IsOnRoute Routes1 B 9. 1.5 < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "RouteSegment Degrees" B < 70 13. ¬ (IsWestOf55W B)	1. "are separated" (A , B)

–Test Frame 35(8):

Stimuli	Response
1. 70 ≤ "RouteSegment Degrees" A 2. "RouteSegment Degrees" A ≤ 80 3. "LatChange Per10DLong LessThanOrEq1" A 4. "LatChange Per10DLong LessThanOrEq1" B 5. ¬ (IsOnRoute Routes2 A) 6. FlightLevel A ≤ 275 7. ¬ (MeetMNPS A) 8. 2 < ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) 9. ¬ (VerticallySeparated (A , B)) 10. ¬ (LongitudinallySeparated (A , B)) 11. "RouteSegment Degrees" B < 70 12. IsOutsideMNPSAirspace A 13. IsOutsideMNPSAirspace B 14. IsOnRoute Routes2 B	1. "are separated" (A , B)

–Test Frame 36(1):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. RouteDeparture A = USA 7. RouteDestination A = Caribbean 8. RouteDeparture B = USA 9. RouteDestination B = Caribbean 10. IsWestOf55W A 11. IsWestOf55W B 12. ¬ (VerticallySeparated (A , B)) 13. ¬ (LongitudinallySeparated (A , B)) 14. "LatChange Per10DLong LessThanOrEq3" A 15. "LatChange Per10DLong LessThanOrEq3" B	1. "are separated" (A , B)

–Test Frame 37(2):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. RouteDestination A = USA 7. RouteDeparture A = Caribbean 8. RouteDestination B = USA 9. RouteDeparture B = Caribbean 10. IsWestOf55W A 11. IsWestOf55W B 12. ¬ (VerticallySeparated (A , B)) 13. ¬ (LongitudinallySeparated (A , B)) 14. "LatChange Per10DLong LessThanOrEq3" A 15. "LatChange Per10DLong LessThanOrEq3" B	1. "are separated" (A , B)

–Test Frame 38(3):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. RouteDeparture A = Caribbean 7. RouteDestination A = CAN 8. RouteDeparture B = Caribbean 9. RouteDestination B = CAN 10. IsWestOf55W A 11. IsWestOf55W B 12. ¬ (VerticallySeparated (A , B)) 13. ¬ (LongitudinallySeparated (A , B)) 14. "LatChange Per10DLong LessThanOrEq3" A 15. "LatChange Per10DLong LessThanOrEq3" B	1. "are separated" (A , B)

–Test Frame 39(4):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. RouteDeparture A = Caribbean 7. RouteDestination A = BDA 8. RouteDeparture B = Caribbean 9. RouteDestination B = BDA 10. IsWestOf55W A 11. IsWestOf55W B 12. ¬ (VerticallySeparated (A , B)) 13. ¬ (LongitudinallySeparated (A , B)) 14. "LatChange Per10DLong LessThanOrEq3" A 15. "LatChange Per10DLong LessThanOrEq3" B	1. "are separated" (A , B)

–Test Frame 40(5):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. RouteDestination A = Caribbean 7. RouteDeparture A = CAN 8. RouteDestination B = Caribbean 9. RouteDeparture B = CAN 10. IsWestOf55W A 11. IsWestOf55W B 12. ¬ (VerticallySeparated (A , B)) 13. ¬ (LongitudinallySeparated (A , B)) 14. "LatChange Per10DLong LessThanOrEq3" A 15. "LatChange Per10DLong LessThanOrEq3" B	1. "are separated" (A , B)

–Test Frame 41(6):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 6. RouteDestination A = Caribbean 7. RouteDeparture A = BDA 8. RouteDestination B = Caribbean 9. RouteDeparture B = BDA 10. IsWestOf55W A 11. IsWestOf55W B 12. ¬ (VerticallySeparated (A , B)) 13. ¬ (LongitudinallySeparated (A , B)) 14. "LatChange Per10DLong LessThanOrEq3" A 15. "LatChange Per10DLong LessThanOrEq3" B	1. "are separated" (A , B)

–Test Frame 42(1):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDeparture A = IberianPeninsula 6. RouteDestination A = Azores 7. RouteDeparture B = IberianPeninsula 8. RouteDestination B = Azores 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B 14. ¬ (IsWestOf55W B)	1. "are separated" (A , B)

–Test Frame 43(2):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDestination A = IberianPeninsula 6. RouteDeparture A = Azores 7. RouteDestination B = IberianPeninsula 8. RouteDeparture B = Azores 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B 14. ¬ (IsWestOf55W B)	1. "are separated" (A , B)

–Test Frame 44(3):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDeparture A = USA 6. RouteDestination A = BDA 7. RouteDeparture B = USA 8. RouteDestination B = BDA 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B 14. ¬ (IsWestOf55W B)	1. "are separated" (A , B)

–Test Frame 45(4):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDeparture A = Iceland 6. RouteDestination A = Scandinavia 7. RouteDeparture B = Iceland 8. RouteDestination B = Scandinavia 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B 14. ¬ (IsWestOf55W B)	1. "are separated" (A , B)

–Test Frame 46(5):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDestination A = USA 6. RouteDeparture A = BDA 7. RouteDestination B = USA 8. RouteDeparture B = BDA 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B 14. ¬ (IsWestOf55W B)	1. "are separated" (A , B)

–Test Frame 47(6):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDestination A = Iceland 6. RouteDeparture A = Scandinavia 7. RouteDestination B = Iceland 8. RouteDeparture B = Scandinavia 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B 14. ¬ (IsWestOf55W B)	1. "are separated" (A , B)

–Test Frame 48(7):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDeparture A = Iceland 6. RouteDestination A = UnitedKingdom 7. RouteDeparture B = Iceland 8. RouteDestination B = UnitedKingdom 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B 14. ¬ (IsWestOf55W B)	1. "are separated" (A , B)

–Test Frame 49(8):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDestination A = Iceland 6. RouteDeparture A = UnitedKingdom 7. RouteDestination B = Iceland 8. RouteDeparture B = UnitedKingdom 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B 14. ¬ (IsWestOf55W B)	1. "are separated" (A , B)

–Test Frame 50(9):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDeparture A = BDA 6. RouteDestination A = CAN 7. RouteDeparture B = BDA 8. RouteDestination B = CAN 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B 14. ¬ (IsWestOf55W B)	1. "are separated" (A , B)

–Test Frame 51(10):

Stimuli	Response
1. 80 < "RouteSegment Degrees" A 2. 80 < "RouteSegment Degrees" B 3. IsOutsideMNPSAirspace A 4. IsOutsideMNPSAirspace B 5. RouteDestination A = BDA 6. RouteDeparture A = CAN 7. RouteDestination B = BDA 8. RouteDeparture B = CAN 9. 90 < ABS (LateralPositionInMiles A − LateralPositionInMiles B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B 14. ¬ (IsWestOf55W B)	1. "are separated" (A , B)

D.1.3 Longitudinal Separation

–Test Frame 52(1):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 2. IsSupersonic A 3. IsSupersonic B 4. IsLevel A 5. IsLevel B 6. SameMachNumber (A , B) 7. "SameOr Diverging Tracks" (A , B) 8. 10 < ABS (TimeAtPosition A − TimeAtPosition B) 9. "Appropriate TimeSep AtCommon Point" (A , B) 10. ¬ (VerticallySeparated (A , B)) 11. ¬ (LaterallySeparated (A , B))	1. "are separated" (A , B)

–Test Frame 53(2):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (IsTurbojet B)	
4. ¬ ("SameOr Diverging Tracks" (A , B))	
5. IsOnRoute Routes3 A	
6. IsOnRoute Routes3 B	
7. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	
8. ¬ (VerticallySeparated (A , B))	
9. ¬ (LaterallySeparated (A , B))	

–Test Frame 54(3):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. IsSupersonic A	
3. IsSupersonic B	
4. ReportedOverCommonPoint (A , B)	
5. SameType (A , B)	
6. InCruiseClimb A	
7. InCruiseClimb B	
8. "SameOr Diverging Tracks" (A , B)	
9. 10 < ABS (TimeAtPosition A − TimeAtPosition B)	
10. ¬ (VerticallySeparated (A , B))	
11. ¬ (LaterallySeparated (A , B))	
12. ¬ ("Appropriate TimeSep AtCommon Point" (A , B))	

–Test Frame 55(4):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (ReportedOverCommonPoint (A , B))	
4. ¬ (IsTurbojet A)	
5. ¬ (IsOnRoute Routes3 B)	
6. 30 < ABS (TimeAtPosition A − TimeAtPosition B)	
7. ¬ (VerticallySeparated (A , B))	
8. ¬ (LaterallySeparated (A , B))	
9. IsTurbojet B	

–Test Frame 56(5):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. IsSupersonic A	
3. IsSupersonic B	
4. ¬ (SameMachNumber (A , B))	
5. 15 < ABS (TimeAtPosition A − TimeAtPosition B)	
6. ¬ (VerticallySeparated (A , B))	
7. ¬ (LaterallySeparated (A , B))	
8. ReportedOverCommonPoint (A , B)	
9. IsLevel A	
10. IsLevel B	

–Test Frame 57(6):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. IsSupersonic A	
3. IsSupersonic B	
4. ¬ (IsLevel B)	
5. 15 < ABS (TimeAtPosition A − TimeAtPosition B)	
6. ¬ (VerticallySeparated (A , B))	
7. ¬ (LaterallySeparated (A , B))	
8. ReportedOverCommonPoint (A , B)	
9. IsLevel A	
10. SameMachNumber (A , B)	

–Test Frame 58(7):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. IsSupersonic A	
3. IsSupersonic B	
4. ¬ (IsLevel A)	
5. ¬ (SameType (A , B))	
6. 15 < ABS (TimeAtPosition A − TimeAtPosition B)	
7. ¬ (VerticallySeparated (A , B))	
8. ¬ (LaterallySeparated (A , B))	
9. ReportedOverCommonPoint (A , B)	
10. IsLevel B	
11. SameMachNumber (A , B)	

–Test Frame 59(8):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. "separation check time" < ept (A , B) 4. "separation check time" < StartTime ("turbojetOppDir NoLongSepPeriod" (A , B)) 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LaterallySeparated (A , B)) 7. IsSupersonic B 8. IsTurbojet B	1. "are separated" (A , B)

–Test Frame 60(9):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (ReportedOverCommonPoint (A , B)) 3. "separation check time" < ept (A , B) − 15 4. "separation check time" < StartTime ("turbojetOppDir NoLongSepPeriod" (A , B)) 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LaterallySeparated (A , B)) 7. IsSupersonic B 8. IsTurbojet B	1. "are separated" (A , B)

–Test Frame 61(10):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. EndTime ("turbojetOppDir NoLongSepPeriod" (A , B)) < "separation check time" 6. ¬ (VerticallySeparated (A , B)) 7. ¬ (LaterallySeparated (A , B)) 8. StartTime ("turbojetOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 62(11):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. ¬ (IsTurbojet B) 4. ept (A , B) + 10 < "separation check time" 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LaterallySeparated (A , B)) 7. StartTime ("turbojetOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 63(12):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (ReportedOverCommonPoint (A , B)) 3. ¬ (IsTurbojet B) 4. ept (A , B) + 15 < "separation check time" 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LaterallySeparated (A , B)) 7. StartTime ("turbojetOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 64(13):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. "turbojetSameDir LongSep" (A , B) < ABS (TimeAtPosition A − TimeAtPosition B) 6. ¬ (VerticallySeparated (A , B)) 7. ¬ (LaterallySeparated (A , B))	1. "are separated" (A , B)

–Test Frame 65(14):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (IsTurbojet B)	
4. ¬ ("SameOr Diverging Tracks" (A , B))	
5. ¬ (IsOnRoute Routes3 A)	
6. 30 < ABS (TimeAtPosition A − TimeAtPosition B)	
7. ¬ (VerticallySeparated (A , B))	
8. ¬ (LaterallySeparated (A , B))	
9. ReportedOverCommonPoint (A , B)	

–Test Frame 66(15):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. IsSupersonic A	
3. IsSupersonic B	
4. ¬ (ReportedOverCommonPoint (A , B))	
5. ¬ ("Appropriate TimeSep AtCommon Point" (A , B))	
6. 15 < ABS (TimeAtPosition A − TimeAtPosition B)	
7. ¬ (VerticallySeparated (A , B))	
8. ¬ (LaterallySeparated (A , B))	
9. IsLevel A	
10. IsLevel B	
11. SameMachNumber (A , B)	

–Test Frame 67(1):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (IsTurbojet B)	
4. ¬ ("SameOr Diverging Tracks" (A , B))	
5. RouteDeparture A = USA	
6. RouteDestination A = Caribbean	
7. RouteDeparture B = USA	
8. RouteDestination B = Caribbean	
9. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	
10. ¬ (VerticallySeparated (A , B))	
11. ¬ (LaterallySeparated (A , B))	

–Test Frame 68(2):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (IsTurbojet B)	
4. ¬ ("SameOr Diverging Tracks" (A , B))	
5. RouteDeparture A = BDA	
6. RouteDestination A = USA	
7. RouteDeparture B = BDA	
8. RouteDestination B = USA	
9. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	
10. ¬ (VerticallySeparated (A , B))	
11. ¬ (LaterallySeparated (A , B))	

–Test Frame 69(3):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (IsTurbojet B)	
4. ¬ ("SameOr Diverging Tracks" (A , B))	
5. RouteDeparture A = Caribbean	
6. RouteDestination A = CAN	
7. RouteDeparture B = Caribbean	
8. RouteDestination B = CAN	
9. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	
10. ¬ (VerticallySeparated (A , B))	
11. ¬ (LaterallySeparated (A , B))	

–Test Frame 70(4):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. ¬ (IsTurbojet B)	
4. ¬ ("SameOr Diverging Tracks" (A , B))	
5. RouteDeparture A = CAN	
6. RouteDestination A = BDA	
7. RouteDeparture B = CAN	
8. RouteDestination B = BDA	
9. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	
10. ¬ (VerticallySeparated (A , B))	
11. ¬ (LaterallySeparated (A , B))	

–Test Frame 71(1):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. "separation check time" < ept (A , B) 4. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 5. "separation check time" < StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 6. ¬ (VerticallySeparated (A , B)) 7. ¬ (LaterallySeparated (A , B)) 8. IsSupersonic B 9. IsTurbojet B 10. MeetMNPS A 11. MeetMNPS B 12. HavePartOfRouteInMNPSAirspace A 13. HavePartOfRouteInMNPSAirspace B 14. EnterWATRSAirspaceAtSomeTime A 15. EnterWATRSAirspaceAtSomeTime B 16. IsWestOf60W A 17. IsWestOf60W B 18. MachTechniqueUsed A 19. MachTechniqueUsed B 20. OnPublishedRoute A 21. OnPublishedRoute B 22. "SameOr Diverging Tracks" (A , B)	1. "are separated" (A , B)

–Test Frame 72(2):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. "separation check time" < ept (A , B) 4. ¬ (IsWestOf60W B) 5. ¬ (InWATRSAirspace B) 6. ¬ (VerticallySeparated (A , B)) 7. ¬ (LaterallySeparated (A , B)) 8. IsSupersonic B 9. IsTurbojet B 10. EnterWATRSAirspaceAtSomeTime A 11. EnterWATRSAirspaceAtSomeTime B 12. IsWestOf60W A 13. MachTechniqueUsed A 14. MachTechniqueUsed B 15. OnPublishedRoute A 16. OnPublishedRoute B 17. "SameOr Diverging Tracks" (A , B) 18. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 19. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 73(3):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. "separation check time" < ept (A , B) 4. ¬ (IsWestOf60W A) 5. ¬ (InWATRSAirspace A) 6. ¬ (VerticallySeparated (A , B)) 7. ¬ (LaterallySeparated (A , B)) 8. IsSupersonic B 9. IsTurbojet B 10. EnterWATRSAirspaceAtSomeTime A 11. EnterWATRSAirspaceAtSomeTime B 12. IsWestOf60W B 13. MachTechniqueUsed A 14. MachTechniqueUsed B 15. OnPublishedRoute A 16. OnPublishedRoute B 17. "SameOr Diverging Tracks" (A , B) 18. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 19. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 74(4):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. "separation check time" < ept (A , B) 4. ept (A , B) ≤ StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LaterallySeparated (A , B)) 7. IsSupersonic B 8. IsTurbojet B 9. EnterWATRSAirspaceAtSomeTime A 10. EnterWATRSAirspaceAtSomeTime B 11. IsWestOf60W A 12. IsWestOf60W B 13. MachTechniqueUsed A 14. MachTechniqueUsed B 15. OnPublishedRoute A 16. OnPublishedRoute B 17. "SameOr Diverging Tracks" (A , B)	1. "are separated" (A , B)

–Test Frame 75(5):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. "separation check time" < ept (A , B) 4. ¬ ("SameOr Diverging Tracks" (A , B)) 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LaterallySeparated (A , B)) 7. IsSupersonic B 8. IsTurbojet B 9. EnterWATRSAirspaceAtSomeTime A 10. EnterWATRSAirspaceAtSomeTime B 11. IsWestOf60W A 12. IsWestOf60W B 13. MachTechniqueUsed A 14. MachTechniqueUsed B 15. OnPublishedRoute A 16. OnPublishedRoute B 17. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 18. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 76(6):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. "separation check time" < ept (A , B) 4. ¬ (OnPublishedRoute B) 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LaterallySeparated (A , B)) 7. IsSupersonic B 8. IsTurbojet B 9. EnterWATRSAirspaceAtSomeTime A 10. EnterWATRSAirspaceAtSomeTime B 11. IsWestOf60W A 12. IsWestOf60W B 13. MachTechniqueUsed A 14. MachTechniqueUsed B 15. OnPublishedRoute A 16. "SameOr Diverging Tracks" (A , B) 17. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 18. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 77(7):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. "separation check time" < ept (A , B) 4. ¬ (OnPublishedRoute A) 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LaterallySeparated (A , B)) 7. IsSupersonic B 8. IsTurbojet B 9. EnterWATRSAirspaceAtSomeTime A 10. EnterWATRSAirspaceAtSomeTime B 11. IsWestOf60W A 12. IsWestOf60W B 13. MachTechniqueUsed A 14. MachTechniqueUsed B 15. OnPublishedRoute B 16. "SameOr Diverging Tracks" (A , B) 17. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 18. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 78(8):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. "separation check time" < ept (A , B) 4. ¬ (MachTechniqueUsed B) 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LaterallySeparated (A , B)) 7. IsSupersonic B 8. IsTurbojet B 9. EnterWATRSAirspaceAtSomeTime A 10. EnterWATRSAirspaceAtSomeTime B 11. IsWestOf60W A 12. IsWestOf60W B 13. MachTechniqueUsed A 14. OnPublishedRoute A 15. OnPublishedRoute B 16. "SameOr Diverging Tracks" (A , B) 17. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 18. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 79(9):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. "separation check time" < ept (A , B) 4. ¬ (MachTechniqueUsed A) 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LaterallySeparated (A , B)) 7. IsSupersonic B 8. IsTurbojet B 9. EnterWATRSAirspaceAtSomeTime A 10. EnterWATRSAirspaceAtSomeTime B 11. IsWestOf60W A 12. IsWestOf60W B 13. MachTechniqueUsed B 14. OnPublishedRoute A 15. OnPublishedRoute B 16. "SameOr Diverging Tracks" (A , B) 17. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 18. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 80(10):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. "separation check time" < ept (A , B) 4. ¬ (EnterWATRSAirspaceAtSomeTime B) 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LaterallySeparated (A , B)) 7. IsSupersonic B 8. IsTurbojet B 9. EnterWATRSAirspaceAtSomeTime A 10. IsWestOf60W A 11. IsWestOf60W B 12. MachTechniqueUsed A 13. MachTechniqueUsed B 14. OnPublishedRoute A 15. OnPublishedRoute B 16. "SameOr Diverging Tracks" (A , B) 17. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 18. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 81(11):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ReportedOverCommonPoint (A , B) 3. "separation check time" < ept (A , B) 4. ¬ (EnterWATRSAirspaceAtSomeTime A) 5. ¬ (VerticallySeparated (A , B)) 6. ¬ (LaterallySeparated (A , B)) 7. IsSupersonic B 8. IsTurbojet B 9. EnterWATRSAirspaceAtSomeTime B 10. IsWestOf60W A 11. IsWestOf60W B 12. MachTechniqueUsed A 13. MachTechniqueUsed B 14. OnPublishedRoute A 15. OnPublishedRoute B 16. "SameOr Diverging Tracks" (A , B) 17. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 18. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 82(1):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. EnterWATRSAirspaceAtSomeTime A 6. EnterWATRSAirspaceAtSomeTime B 7. IsWestOf60W A 8. IsWestOf60W B 9. MachTechniqueUsed A 10. MachTechniqueUsed B 11. OnPublishedRoute A 12. OnPublishedRoute B 13. "SameOr Diverging Tracks" (A , B) 14. ReportedOverCommonPoint (A , B) 15. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 16. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < "separation check time" 17. ¬ (VerticallySeparated (A , B)) 18. ¬ (LaterallySeparated (A , B)) 19. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 20. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 83(2):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. EnterWATRSAirspaceAtSomeTime A 6. EnterWATRSAirspaceAtSomeTime B 7. MachTechniqueUsed A 8. MachTechniqueUsed B 9. OnPublishedRoute A 10. OnPublishedRoute B 11. "SameOr Diverging Tracks" (A , B) 12. InWATRSAirspace A 13. InWATRSAirspace B 14. ¬ (ReportedOverCommonPoint (A , B)) 15. ept (A , B) + 15 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 16. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < "separation check time" 17. ¬ (VerticallySeparated (A , B)) 18. ¬ (LaterallySeparated (A , B)) 19. ept (A , B) − 15 ≤ StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 20. ept (A , B) − 15 ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 84(3):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (IsWestOf60W B) 6. ¬ (InWATRSAirspace B) 7. ReportedOverCommonPoint (A , B) 8. ept (A , B) + 10 < "separation check time" 9. ¬ (VerticallySeparated (A , B)) 10. ¬ (LaterallySeparated (A , B)) 11. EnterWATRSAirspaceAtSomeTime A 12. EnterWATRSAirspaceAtSomeTime B 13. IsWestOf60W A 14. MachTechniqueUsed A 15. MachTechniqueUsed B 16. OnPublishedRoute A 17. OnPublishedRoute B 18. "SameOr Diverging Tracks" (A , B) 19. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 85(4):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. EnterWATRSAirspaceAtSomeTime A 6. EnterWATRSAirspaceAtSomeTime B 7. IsWestOf60W A 8. IsWestOf60W B 9. MachTechniqueUsed A 10. MachTechniqueUsed B 11. OnPublishedRoute A 12. OnPublishedRoute B 13. "SameOr Diverging Tracks" (A , B) 14. ¬ (ReportedOverCommonPoint (A , B)) 15. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ ept (A , B) + 15 16. ept (A , B) + 15 < "separation check time" 17. ¬ (VerticallySeparated (A , B)) 18. ¬ (LaterallySeparated (A , B)) 19. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) − 15 20. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 86(5):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (IsWestOf60W A) 6. ¬ (InWATRSAirspace A) 7. ReportedOverCommonPoint (A , B) 8. ept (A , B) + 10 < "separation check time" 9. ¬ (VerticallySeparated (A , B)) 10. ¬ (LaterallySeparated (A , B)) 11. EnterWATRSAirspaceAtSomeTime A 12. EnterWATRSAirspaceAtSomeTime B 13. IsWestOf60W B 14. MachTechniqueUsed A 15. MachTechniqueUsed B 16. OnPublishedRoute A 17. OnPublishedRoute B 18. "SameOr Diverging Tracks" (A , B) 19. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 87(6):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ReportedOverCommonPoint (A , B) 6. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) ≤ ept (A , B) + 10 7. ept (A , B) + 10 < "separation check time" 8. ¬ (VerticallySeparated (A , B)) 9. ¬ (LaterallySeparated (A , B)) 10. ept (A , B) ≤ StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 11. EnterWATRSAirspaceAtSomeTime A 12. EnterWATRSAirspaceAtSomeTime B 13. IsWestOf60W A 14. IsWestOf60W B 15. MachTechniqueUsed A 16. MachTechniqueUsed B 17. OnPublishedRoute A 18. OnPublishedRoute B 19. "SameOr Diverging Tracks" (A , B)	1. "are separated" (A , B)

–Test Frame 88(7):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ ("SameOr Diverging Tracks" (A , B)) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time" 8. ¬ (VerticallySeparated (A , B)) 9. ¬ (LaterallySeparated (A , B)) 10. EnterWATRSAirspaceAtSomeTime A 11. EnterWATRSAirspaceAtSomeTime B 12. IsWestOf60W A 13. IsWestOf60W B 14. MachTechniqueUsed A 15. MachTechniqueUsed B 16. OnPublishedRoute A 17. OnPublishedRoute B 18. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 89(8):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (OnPublishedRoute B) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time" 8. ¬ (VerticallySeparated (A , B)) 9. ¬ (LaterallySeparated (A , B)) 10. EnterWATRSAirspaceAtSomeTime A 11. EnterWATRSAirspaceAtSomeTime B 12. IsWestOf60W A 13. IsWestOf60W B 14. MachTechniqueUsed A 15. MachTechniqueUsed B 16. OnPublishedRoute A 17. "SameOr Diverging Tracks" (A , B) 18. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 90(9):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (OnPublishedRoute A) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time" 8. ¬ (VerticallySeparated (A , B)) 9. ¬ (LaterallySeparated (A , B)) 10. EnterWATRSAirspaceAtSomeTime A 11. EnterWATRSAirspaceAtSomeTime B 12. IsWestOf60W A 13. IsWestOf60W B 14. MachTechniqueUsed A 15. MachTechniqueUsed B 16. OnPublishedRoute B 17. "SameOr Diverging Tracks" (A , B) 18. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 91(10):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (MachTechniqueUsed B) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time" 8. ¬ (VerticallySeparated (A , B)) 9. ¬ (LaterallySeparated (A , B)) 10. EnterWATRSAirspaceAtSomeTime A 11. EnterWATRSAirspaceAtSomeTime B 12. IsWestOf60W A 13. IsWestOf60W B 14. MachTechniqueUsed A 15. OnPublishedRoute A 16. OnPublishedRoute B 17. "SameOr Diverging Tracks" (A , B) 18. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 92(11):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (MachTechniqueUsed A) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time" 8. ¬ (VerticallySeparated (A , B)) 9. ¬ (LaterallySeparated (A , B)) 10. EnterWATRSAirspaceAtSomeTime A 11. EnterWATRSAirspaceAtSomeTime B 12. IsWestOf60W A 13. IsWestOf60W B 14. MachTechniqueUsed B 15. OnPublishedRoute A 16. OnPublishedRoute B 17. "SameOr Diverging Tracks" (A , B) 18. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 93(12):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (EnterWATRSAirspaceAtSomeTime B) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time" 8. ¬ (VerticallySeparated (A , B)) 9. ¬ (LaterallySeparated (A , B)) 10. EnterWATRSAirspaceAtSomeTime A 11. IsWestOf60W A 12. IsWestOf60W B 13. MachTechniqueUsed A 14. MachTechniqueUsed B 15. OnPublishedRoute A 16. OnPublishedRoute B 17. "SameOr Diverging Tracks" (A , B) 18. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 94(13):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (EnterWATRSAirspaceAtSomeTime A) 6. ReportedOverCommonPoint (A , B) 7. ept (A , B) + 10 < "separation check time" 8. ¬ (VerticallySeparated (A , B)) 9. ¬ (LaterallySeparated (A , B)) 10. EnterWATRSAirspaceAtSomeTime B 11. IsWestOf60W A 12. IsWestOf60W B 13. MachTechniqueUsed A 14. MachTechniqueUsed B 15. OnPublishedRoute A 16. OnPublishedRoute B 17. "SameOr Diverging Tracks" (A , B) 18. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B))	1. "are separated" (A , B)

–Test Frame 95(14):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. EnterWATRSAirspaceAtSomeTime A 6. EnterWATRSAirspaceAtSomeTime B 7. IsWestOf60W A 8. IsWestOf60W B 9. MachTechniqueUsed A 10. MachTechniqueUsed B 11. OnPublishedRoute A 12. OnPublishedRoute B 13. "SameOr Diverging Tracks" (A , B) 14. ReportedOverCommonPoint (A , B) 15. ept (A , B) + 10 < EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 16. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < "separation check time" 17. ¬ (VerticallySeparated (A , B)) 18. ¬ (LaterallySeparated (A , B)) 19. ept (A , B) ≤ StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) 20. ept (A , B) ≤ "separation check time"	1. "are separated" (A , B)

–Test Frame 96(15):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (HavePartOfRouteInMNPSAirspace B) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ReportedOverCommonPoint (A , B) 16. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) $\leq$ ept (A , B) + 10 17. ept (A , B) + 10 < "separation check time" 18. ¬ (VerticallySeparated (A , B)) 19. ¬ (LaterallySeparated (A , B)) 20. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 21. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) $\leq$ "separation check time" 22. MeetMNPS A 23. MeetMNPS B 24. HavePartOfRouteInMNPSAirspace A	1. "are separated" (A , B)

–Test Frame 97(16):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (HavePartOfRouteInMNPSAirspace A) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ReportedOverCommonPoint (A , B) 16. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) $\leq$ ept (A , B) + 10 17. ept (A , B) + 10 < "separation check time" 18. ¬ (VerticallySeparated (A , B)) 19. ¬ (LaterallySeparated (A , B)) 20. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) < ept (A , B) 21. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) $\leq$ "separation check time" 22. MeetMNPS A 23. MeetMNPS B 24. HavePartOfRouteInMNPSAirspace B	1. "are separated" (A , B)

–Test Frame 98(17):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (MeetMNPS B) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ReportedOverCommonPoint (A , B) 16. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) $\leq$ ept (A , B) + 10 17. ept (A , B) + 10 $<$ "separation check time" 18. ¬ (VerticallySeparated (A , B)) 19. ¬ (LaterallySeparated (A , B)) 20. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) $<$ ept (A , B) 21. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) $\leq$ "separation check time" 22. MeetMNPS A 23. HavePartOfRouteInMNPSAirspace A 24. HavePartOfRouteInMNPSAirspace B	1. "are separated" (A , B)

–Test Frame 99(18):

Stimuli	Response
1. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (MeetMNPS A) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ReportedOverCommonPoint (A , B) 16. EndTime ("WATRSOppDir NoLongSepPeriod" (A , B)) $\leq$ ept (A , B) + 10 17. ept (A , B) + 10 $<$ "separation check time" 18. ¬ (VerticallySeparated (A , B)) 19. ¬ (LaterallySeparated (A , B)) 20. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) $<$ ept (A , B) 21. StartTime ("WATRSOppDir NoLongSepPeriod" (A , B)) $\leq$ "separation check time" 22. MeetMNPS B 23. HavePartOfRouteInMNPSAirspace A 24. HavePartOfRouteInMNPSAirspace B	1. "are separated" (A , B)

–Test Frame 100(1):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (HavePartOfRouteInMNPSAirspace B) 6. EnterWATRSAirspaceAtSomeTime A 7. EnterWATRSAirspaceAtSomeTime B 8. IsWestOf60W A 9. IsWestOf60W B 10. MachTechniqueUsed A 11. MachTechniqueUsed B 12. OnPublishedRoute A 13. OnPublishedRoute B 14. "SameOr Diverging Tracks" (A , B) 15. ¬ (InCruiseClimb A) 16. ¬ (InCruiseClimb B) 17. "Appropriate TimeSep AtCommon Point" (A , B) 18. Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B)) $\leq$ 0.6 19. 0.3 < Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B)) 20. "WATRSSameDir LongSep" (A , B) < 10 21. "WATRSSameDir LongSep" (A , B) < ABS (TimeAtPosition A − TimeAtPosition B) 22. ¬ (VerticallySeparated (A , B)) 23. ¬ (LaterallySeparated (A , B))	1. "are separated" (A , B)

–Test Frame 101(2):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. ¬ (IsWestOf60W B)	
10. ¬ (InWATRSAirspace B)	
11. InCruiseClimb A	
12. 10 < ABS (TimeAtPosition A − TimeAtPosition B)	
13. Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B)) ≤ 0.02	
14. ¬ (VerticallySeparated (A , B))	
15. ¬ (LaterallySeparated (A , B))	

–Test Frame 102(3):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. ¬ (IsWestOf60W A)	
10. "SameOr Diverging Tracks" (A , B)	
11. ¬ (InWATRSAirspace A)	
12. InCruiseClimb B	
13. "Appropriate TimeSep AtCommon Point" (A , B)	
14. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.03	
15. 0.02 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
16. 9 $<$ ABS (TimeAtPosition A – TimeAtPosition B)	
17. ¬ (VerticallySeparated (A , B))	
18. ¬ (LaterallySeparated (A , B))	

–Test Frame 103(4):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. MeetMNPS A 6. MeetMNPS B 7. HavePartOfRouteInMNPSAirspace A 8. HavePartOfRouteInMNPSAirspace B 9. ¬ (OnPublishedRoute B) 10. "SameOr Diverging Tracks" (A , B) 11. "Appropriate TimeSep AtCommon Point" (A , B) 12. Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B)) $\leq$ 0.04 13. 0.03 < Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B)) 14. 8 < ABS (TimeAtPosition A − TimeAtPosition B) 15. ¬ (VerticallySeparated (A , B)) 16. ¬ (LaterallySeparated (A , B))	1. "are separated" (A , B)

–Test Frame 104(5):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. ¬ (OnPublishedRoute A)	
10. "SameOr Diverging Tracks" (A , B)	
11. "Appropriate TimeSep AtCommon Point" (A , B)	
12. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.05	
13. 0.04 < Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
14. 7 < ABS (TimeAtPosition A – TimeAtPosition B)	
15. ¬ (VerticallySeparated (A , B))	
16. ¬ (LaterallySeparated (A , B))	

–Test Frame 105(6):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (HavePartOfRouteInMNPSAirspace A)	
6. EnterWATRSAirspaceAtSomeTime A	
7. EnterWATRSAirspaceAtSomeTime B	
8. MachTechniqueUsed A	
9. MachTechniqueUsed B	
10. OnPublishedRoute A	
11. OnPublishedRoute B	
12. "SameOr Diverging Tracks" (A , B)	
13. InWATRSAirspace A	
14. InWATRSAirspace B	
15. ¬ ("Appropriate TimeSep AtCommon Point" (A , B))	
16. "WATRSSameDir LongSep" (A , B) < 20	
17. "WATRSSameDir LongSep" (A , B) < ABS (TimeAtPosition A – TimeAtPosition B)	
18. ¬ (VerticallySeparated (A , B))	
19. ¬ (LaterallySeparated (A , B))	

–Test Frame 106(7):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. ¬ (EnterWATRSAirspaceAtSomeTime B)	
10. "SameOr Diverging Tracks" (A , B)	
11. "Appropriate TimeSep AtCommon Point" (A , B)	
12. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.06	
13. 0.05 < Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
14. 6 < ABS (TimeAtPosition A – TimeAtPosition B)	
15. ¬ (VerticallySeparated (A , B))	
16. ¬ (LaterallySeparated (A , B))	

–Test Frame 107(8):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (MeetMNPS B)	
6. ¬ (MachTechniqueUsed B)	
7. ¬ (ReportedOverCommonPoint (A , B))	
8. 20 < ABS (TimeAtPosition A − TimeAtPosition B)	
9. ¬ (VerticallySeparated (A , B))	
10. ¬ (LaterallySeparated (A , B))	
11. HavePartOfRouteInMNPSAirspace B	

–Test Frame 108(9):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (MeetMNPS A)	
6. ¬ (MachTechniqueUsed A)	
7. "SameOr Diverging Tracks" (A , B)	
8. ¬ (InCruiseClimb A)	
9. ¬ (InCruiseClimb B)	
10. ReportedOverCommonPoint (A , B)	
11. 15 < ABS (TimeAtPosition A − TimeAtPosition B)	
12. ¬ (VerticallySeparated (A , B))	
13. ¬ (LaterallySeparated (A , B))	

–Test Frame 109(10):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. ¬ (EnterWATRSAirspaceAtSomeTime A)	
10. "SameOr Diverging Tracks" (A , B)	
11. "Appropriate TimeSep AtCommon Point" (A , B)	
12. 0.6 < Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
13. 5 < ABS (TimeAtPosition A – TimeAtPosition B)	
14. ¬ (VerticallySeparated (A , B))	
15. ¬ (LaterallySeparated (A , B))	
16. MachTechniqueUsed B	

–Test Frame 110(11):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (HavePartOfRouteInMNPSAirspace B)	
6. MachTechniqueUsed A	
7. MachTechniqueUsed B	
8. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.3	
9. 20 $\leq$ "WATRSSameDir LongSep" (A , B)	
10. 20 < ABS (TimeAtPosition A – TimeAtPosition B)	
11. ¬ (VerticallySeparated (A , B))	
12. ¬ (LaterallySeparated (A , B))	
13. "SameOr Diverging Tracks" (A , B)	

–Test Frame 111(12):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (HavePartOfRouteInMNPSAirspace B)	
6. ¬ ("SameOr Diverging Tracks" (A , B))	
7. 20 < ABS (TimeAtPosition A – TimeAtPosition B)	
8. ¬ (VerticallySeparated (A , B))	
9. ¬ (LaterallySeparated (A , B))	
10. MeetMNPS B	
11. 0.6 < Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	

–Test Frame 112(13):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (HavePartOfRouteInMNPSAirspace B)	
6. MachTechniqueUsed A	
7. MachTechniqueUsed B	
8. "SameOr Diverging Tracks" (A , B)	
9. ¬ (InCruiseClimb A)	
10. ¬ (InCruiseClimb B)	
11. "Appropriate TimeSep AtCommon Point" (A , B)	
12. 0.6 < Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B))	
13. 5 ≤ "WATRSSameDir LongSep" (A , B)	
14. 5 < ABS (TimeAtPosition A − TimeAtPosition B)	
15. ¬ (VerticallySeparated (A , B))	
16. ¬ (LaterallySeparated (A , B))	

–Test Frame 113(14):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. ¬ (HavePartOfRouteInMNPSAirspace B)	
6. EnterWATRSAirspaceAtSomeTime A	
7. EnterWATRSAirspaceAtSomeTime B	
8. IsWestOf60W A	
9. IsWestOf60W B	
10. MachTechniqueUsed A	
11. MachTechniqueUsed B	
12. OnPublishedRoute A	
13. OnPublishedRoute B	
14. "SameOr Diverging Tracks" (A , B)	
15. ¬ (InCruiseClimb A)	
16. ¬ (InCruiseClimb B)	
17. "Appropriate TimeSep AtCommon Point" (A , B)	
18. 0.6 < Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B))	
19. "WATRSSameDir LongSep" (A , B) < 5	
20. "WATRSSameDir LongSep" (A , B) < ABS (TimeAtPosition A − TimeAtPosition B)	
21. ¬ (VerticallySeparated (A , B))	
22. ¬ (LaterallySeparated (A , B))	

–Test Frame 114(15):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. ¬ (HavePartOfRouteInMNPSAirspace B) 6. MachTechniqueUsed A 7. MachTechniqueUsed B 8. "SameOr Diverging Tracks" (A , B) 9. ¬ (InCruiseClimb A) 10. ¬ (InCruiseClimb B) 11. "Appropriate TimeSep AtCommon Point" (A , B) 12. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.6 13. 0.3 < Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) 14. 10 $\leq$ "WATRSSameDir LongSep" (A , B) 15. 10 < ABS (TimeAtPosition A – TimeAtPosition B) 16. ¬ (VerticallySeparated (A , B)) 17. ¬ (LaterallySeparated (A , B))	1. "are separated" (A , B)

–Test Frame 115(16):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. MinAll (A , B) < ABS (TimeAtPosition A – TimeAtPosition B)	
19. ¬ (VerticallySeparated (A , B))	
20. ¬ (LaterallySeparated (A , B))	

–Test Frame 116(17):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 2. ¬ (IsSupersonic B) 3. IsTurbojet A 4. IsTurbojet B 5. MeetMNPS A 6. MeetMNPS B 7. HavePartOfRouteInMNPSAirspace A 8. HavePartOfRouteInMNPSAirspace B 9. ¬ (MachTechniqueUsed B) 10. "SameOr Diverging Tracks" (A , B) 11. "Appropriate TimeSep AtCommon Point" (A , B) 12. 5 < ABS (TimeAtPosition A − TimeAtPosition B) 13. 0.06 < Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B)) 14. ¬ (VerticallySeparated (A , B)) 15. ¬ (LaterallySeparated (A , B)) 16. EnterWATRSAirspaceAtSomeTime A	1. "are separated" (A , B)

–Test Frame 117(1):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.03	
20. 0.02 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. "WATRSSameDir LongSep" (A , B) $\leq$ 9	
22. "WATRSSameDir LongSep" (A , B) $<$ ABS (TimeAtPosition A – TimeAtPosition B)	
23. ¬ (VerticallySeparated (A , B))	
24. ¬ (LaterallySeparated (A , B))	

–Test Frame 118(2):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.02	
19. 10 < "WATRSSameDir LongSep" (A , B)	
20. 10 < ABS (TimeAtPosition A – TimeAtPosition B)	
21. ¬ (VerticallySeparated (A , B))	
22. ¬ (LaterallySeparated (A , B))	

–Test Frame 119(3):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.04	
20. 0.03 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. 8 $<$ "WATRSSameDir LongSep" (A , B)	
22. 8 $<$ ABS (TimeAtPosition A – TimeAtPosition B)	
23. ¬ (VerticallySeparated (A , B))	
24. ¬ (LaterallySeparated (A , B))	

–Test Frame 120(4):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. ¬ (InCruiseClimb A)	
20. ¬ (InCruiseClimb B)	
21. $0.6 <$ Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B))	
22. $5 <$ ABS (TimeAtPosition A − TimeAtPosition B)	
23. "WATRSSameDir LongSep" (A , B) ≤ 5	
24. $5 \leq$ "WATRSSameDir LongSep" (A , B)	
25. ¬ (VerticallySeparated (A , B))	
26. ¬ (LaterallySeparated (A , B))	

–Test Frame 121(5):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.05	
20. 0.04 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. 7 $<$ "WATRSSameDir LongSep" (A , B)	
22. 7 $<$ ABS (TimeAtPosition A – TimeAtPosition B)	
23. ¬ (VerticallySeparated (A , B))	
24. ¬ (LaterallySeparated (A , B))	

–Test Frame 122(6):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.06	
20. 0.05 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. 6 $<$ "WATRSSameDir LongSep" (A , B)	
22. 6 $<$ ABS (TimeAtPosition A – TimeAtPosition B)	
23. ¬ (VerticallySeparated (A , B))	
24. ¬ (LaterallySeparated (A , B))	

–Test Frame 123(7):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. 0.06 < Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
20. 5 < "WATRSSameDir LongSep" (A , B)	
21. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) ≤ 0.3	
22. 5 < ABS (TimeAtPosition A – TimeAtPosition B)	
23. ¬ (VerticallySeparated (A , B))	
24. ¬ (LaterallySeparated (A , B))	

–Test Frame 124(8):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. ¬ ("Appropriate TimeSep AtCommon Point" (A , B))	
19. "WATRSSameDir LongSep" (A , B) $\leq$ 10	
20. "WATRSSameDir LongSep" (A , B) $<$ ABS (TimeAtPosition A – TimeAtPosition B)	
21. ¬ (VerticallySeparated (A , B))	
22. ¬ (LaterallySeparated (A , B))	

–Test Frame 125(9):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.06	
20. 0.05 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. InCruiseClimb A	
22. "WATRSSameDir LongSep" (A , B) $\leq$ 6	
23. "WATRSSameDir LongSep" (A , B) $<$ ABS (TimeAtPosition A – TimeAtPosition B)	
24. ¬ (VerticallySeparated (A , B))	
25. ¬ (LaterallySeparated (A , B))	

–Test Frame 126(10):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.05	
20. 0.04 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. InCruiseClimb B	
22. "WATRSSameDir LongSep" (A , B) $\leq$ 7	
23. "WATRSSameDir LongSep" (A , B) $<$ ABS (TimeAtPosition A – TimeAtPosition B)	
24. ¬ (VerticallySeparated (A , B))	
25. ¬ (LaterallySeparated (A , B))	

–Test Frame 127(11):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. ¬ (InCruiseClimb A)	
20. ¬ (InCruiseClimb B)	
21. Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B)) $\leq$ 0.6	
22. 0.3 $<$ Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B))	
23. "WATRSSameDir LongSep" (A , B) $\leq$ 5	
24. "WATRSSameDir LongSep" (A , B) $<$ ABS (TimeAtPosition A − TimeAtPosition B)	
25. ¬ (VerticallySeparated (A , B))	
26. ¬ (LaterallySeparated (A , B))	

–Test Frame 128(12):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.04	
20. 0.03 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. InCruiseClimb A	
22. "WATRSSameDir LongSep" (A , B) $\leq$ 8	
23. "WATRSSameDir LongSep" (A , B) $<$ ABS (TimeAtPosition A – TimeAtPosition B)	
24. ¬ (VerticallySeparated (A , B))	
25. ¬ (LaterallySeparated (A , B))	

–Test Frame 129(13):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B)) $\leq$ 0.03	
20. 0.02 $<$ Mach (FirstAircraft (A , B)) – Mach (SecondAircraft (A , B))	
21. 9 $<$ "WATRSSameDir LongSep" (A , B)	
22. InCruiseClimb A	
23. 9 $<$ ABS (TimeAtPosition A – TimeAtPosition B)	
24. ¬ (VerticallySeparated (A , B))	
25. ¬ (LaterallySeparated (A , B))	

–Test Frame 130(14):

Stimuli	Response
1. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B))	1. "are separated" (A , B)
2. ¬ (IsSupersonic B)	
3. IsTurbojet A	
4. IsTurbojet B	
5. MeetMNPS A	
6. MeetMNPS B	
7. HavePartOfRouteInMNPSAirspace A	
8. HavePartOfRouteInMNPSAirspace B	
9. EnterWATRSAirspaceAtSomeTime A	
10. EnterWATRSAirspaceAtSomeTime B	
11. IsWestOf60W A	
12. IsWestOf60W B	
13. MachTechniqueUsed A	
14. MachTechniqueUsed B	
15. OnPublishedRoute A	
16. OnPublishedRoute B	
17. "SameOr Diverging Tracks" (A , B)	
18. "Appropriate TimeSep AtCommon Point" (A , B)	
19. ¬ (InCruiseClimb A)	
20. ¬ (InCruiseClimb B)	
21. 0.6 < Mach (FirstAircraft (A , B)) − Mach (SecondAircraft (A , B))	
22. "WATRSSameDir LongSep" (A , B) < 5	
23. "WATRSSameDir LongSep" (A , B) < ABS (TimeAtPosition A − TimeAtPosition B)	
24. ¬ (VerticallySeparated (A , B))	
25. ¬ (LaterallySeparated (A , B))	

D.2 Test Frames for "Separation Does Not Exist"

–Test Frame 131(1):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

D.2.1 Vertical Separation

–Test Frame 132(1):

Stimuli	Response
1. 450 < FlightLevel A 2. 450 < FlightLevel B 3. IsSupersonic A 4. ABS (FlightLevel A − FlightLevel B) ≤ 4000 5. ¬ (LaterallySeparated (A , B)) 6. ¬ (LongitudinallySeparated (A , B)) 7. ¬ (IsSupersonic B)	1. ¬ ("are separated" (A , B))

–Test Frame 133(2):

Stimuli	Response
1. ¬ (IsSupersonic A) 2. ¬ (IsSupersonic B) 3. ABS (FlightLevel A − FlightLevel B) ≤ 2000 4. ¬ (LaterallySeparated (A , B)) 5. ¬ (LongitudinallySeparated (A , B)) 6. 450 < FlightLevel A 7. 450 < FlightLevel B	1. ¬ ("are separated" (A , B))

–Test Frame 134(3):

Stimuli	Response
1. FlightLevel A ≤ 280 2. ABS (FlightLevel A − FlightLevel B) ≤ 1000 3. ¬ (LaterallySeparated (A , B)) 4. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 135(4):

Stimuli	Response
1. ABS (FlightLevel A − FlightLevel B) ≤ 1000 2. 280 < FlightLevel A 3. FlightLevel B ≤ 280 4. ¬ (LaterallySeparated (A , B)) 5. ¬ (LongitudinallySeparated (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 136(5):

Stimuli	Response
1. 280 < FlightLevel A 2. FlightLevel A ≤ 450 3. ABS (FlightLevel A − FlightLevel B) ≤ 2000 4. ¬ (LaterallySeparated (A , B)) 5. ¬ (LongitudinallySeparated (A , B)) 6. 450 < FlightLevel B 7. IsSupersonic A	1. ¬ ("are separated" (A , B))

–Test Frame 137(6):

Stimuli	Response
1. 280 < FlightLevel B 2. FlightLevel B ≤ 450 3. ABS (FlightLevel A − FlightLevel B) ≤ 2000 4. ¬ (LaterallySeparated (A , B)) 5. ¬ (LongitudinallySeparated (A , B)) 6. 450 < FlightLevel A 7. IsSupersonic A	1. ¬ ("are separated" (A , B))

–Test Frame 138(7):

Stimuli	Response
1. 450 < FlightLevel A 2. 450 < FlightLevel B 3. ABS (FlightLevel A − FlightLevel B) ≤ 4000 4. IsSupersonic B 5. ¬ (LaterallySeparated (A , B)) 6. ¬ (LongitudinallySeparated (A , B)) 7. ¬ (IsSupersonic A)	1. ¬ ("are separated" (A , B))

D.2.2 Lateral Separation

–Test Frame 139(1):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ "LateralSeparation RequiredInMiles" (A , B) 5. ¬ (LongitudinallySeparated (A , B)) 6. "LatChange Per10DLong LessThanOrEq3" A 7. "LatChange Per10DLong LessThanOrEq3" B	1. ¬ ("are separated" (A , B))

–Test Frame 140(2):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 70 ≤ "RouteSegment Degrees" A 3. "RouteSegment Degrees" A ≤ 80 4. "LatChange Per10DLong LessThanOrEq1" A 5. "LatChange Per10DLong LessThanOrEq1" B 6. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ "LateralSeparation RequiredInDegrees" (A , B) 7. ¬ (LongitudinallySeparated (A , B)) 8. "RouteSegment Degrees" B < 70	1. ¬ ("are separated" (A , B))

–Test Frame 141(3):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 58 < "RouteSegment Degrees" A 3. "RouteSegment Degrees" A < 70 4. ¬ ("LatChange Per10DLong LessThanOrEq2" B) 5. 58 < "RouteSegment Degrees" B 6. "RouteSegment Degrees" B < 70 7. ABS (LateralPositionInMiles A – LateralPositionInMiles B) ≤ "LateralSeparation RequiredInMiles" (A , B) 8. ¬ (LongitudinallySeparated (A , B)) 9. "LatChange Per10DLong LessThanOrEq1" A	1. ¬ ("are separated" (A , B))

–Test Frame 142(4):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. "RouteSegment Degrees" A ≤ 58 3. ¬ ("LatChange Per10DLong LessThanOrEq3" B) 4. "RouteSegment Degrees" B ≤ 58 5. ABS (LateralPositionInMiles A – LateralPositionInMiles B) ≤ "LateralSeparation RequiredInMiles" (A , B) 6. ¬ (LongitudinallySeparated (A , B)) 7. "LatChange Per10DLong LessThanOrEq1" A	1. ¬ ("are separated" (A , B))

–Test Frame 143(5):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ ("LatChange Per10DLong LessThanOrEq3" A) 3. ¬ ("LatChange Per10DLong LessThanOrEq1" B) 4. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ "LateralSeparation RequiredInMiles" (A , B) 5. ¬ (LongitudinallySeparated (A , B)) 6. "RouteSegment Degrees" A ≤ 58 7. 58 < "RouteSegment Degrees" B 8. "LatChange Per10DLong LessThanOrEq1" A	1. ¬ ("are separated" (A , B))

–Test Frame 144(6):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. "RouteSegment Degrees" A ≤ 58 3. "LatChange Per10DLong LessThanOrEq3" A 4. "LatChange Per10DLong LessThanOrEq3" B 5. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ "LateralSeparation RequiredInDegrees" (A , B) 6. ¬ (LongitudinallySeparated (A , B)) 7. "RouteSegment Degrees" B < 70	1. ¬ ("are separated" (A , B))

–Test Frame 145(7):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. "LatChange Per10DLong LessThanOrEq1" A 3. "LatChange Per10DLong LessThanOrEq1" B 4. 70 ≤ "RouteSegment Degrees" B 5. "RouteSegment Degrees" B ≤ 80 6. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ "LateralSeparation RequiredInDegrees" (A , B) 7. ¬ (LongitudinallySeparated (A , B)) 8. "RouteSegment Degrees" A ≤ 58 9. ¬ ("LatChange Per10DLong LessThanOrEq3" B)	1. ¬ ("are separated" (A , B))

–Test Frame 146(8):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 58 < "RouteSegment Degrees" A 3. "RouteSegment Degrees" A < 70 4. "LatChange Per10DLong LessThanOrEq2" A 5. "LatChange Per10DLong LessThanOrEq2" B 6. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ "LateralSeparation RequiredInDegrees" (A , B) 7. ¬ (LongitudinallySeparated (A , B)) 8. "RouteSegment Degrees" B < 70	1. ¬ ("are separated" (A , B))

–Test Frame 147(9):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ ("LatChange Per10DLong LessThanOrEq3" B) 3. ¬ ("LatChange Per10DLong LessThanOrEq2" A) 4. ABS (LateralPositionInMiles A – LateralPositionInMiles B) ≤ "LateralSeparation RequiredInMiles" (A , B) 5. ¬ (LongitudinallySeparated (A , B)) 6. "RouteSegment Degrees" A ≤ 58 7. "LatChange Per10DLong LessThanOrEq1" B	1. ¬ ("are separated" (A , B))

–Test Frame 148(1):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. ¬ (IsOnRoute Routes1 B) 5. ¬ (IsWestOf55W B) 6. ABS (LateralPositionInMiles A – LateralPositionInMiles B) ≤ 60 7. FlightLevel A ≤ 275 8. MeetMNPS A 9. MeetMNPS B 10. HavePartOfRouteInMNPSAirspace A 11. HavePartOfRouteInMNPSAirspace B 12. ¬ (LongitudinallySeparated (A , B)) 13. "LatChange Per10DLong LessThanOrEq3" A 14. "LatChange Per10DLong LessThanOrEq3" B	1. ¬ ("are separated" (A , B))

–Test Frame 149(2):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. IsOutsideMNPSAirspace A 5. IsOutsideMNPSAirspace B 6. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ 90 7. IsOnRoute Routes2 A 8. IsOnRoute Routes2 B 9. IsWestOf55W A 10. IsWestOf55W B 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B	1. ¬ ("are separated" (A , B))

–Test Frame 150(3):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. ¬ (IsOnRoute Routes1 A) 5. ¬ (IsWestOf55W A) 6. IsSupersonic A 7. IsSupersonic B 8. 275 < FlightLevel A 9. 275 < FlightLevel B 10. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ 60 11. ¬ (LongitudinallySeparated (A , B)) 12. "LatChange Per10DLong LessThanOrEq3" A 13. "LatChange Per10DLong LessThanOrEq3" B	1. ¬ ("are separated" (A , B))

–Test Frame 151(4):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. ¬ (IsOutsideMNPSAirspace B) 5. FlightLevel B ≤ 275 6. ¬ (HavePartOfRouteInMNPSAirspace B) 7. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ 120 8. ¬ (LongitudinallySeparated (A , B)) 9. "LatChange Per10DLong LessThanOrEq3" A 10. "LatChange Per10DLong LessThanOrEq3" B 11. IsOutsideMNPSAirspace A 12. IsOnRoute Routes1 B	1. ¬ ("are separated" (A , B))

–Test Frame 152(5):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. ¬ (IsOutsideMNPSAirspace A) 5. ¬ (IsSupersonic B) 6. ¬ (HavePartOfRouteInMNPSAirspace A) 7. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ 120 8. ¬ (LongitudinallySeparated (A , B)) 9. "LatChange Per10DLong LessThanOrEq3" A 10. "LatChange Per10DLong LessThanOrEq3" B 11. IsOutsideMNPSAirspace B 12. IsOnRoute Routes1 B	1. ¬ ("are separated" (A , B))

–Test Frame 153(6):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B))	1. ¬ ("are separated" (A , B))
2. 80 < "RouteSegment Degrees" A	
3. 80 < "RouteSegment Degrees" B	
4. ¬ (IsOnRoute Routes1 B)	
5. ¬ (IsOnRoute Routes2 B)	
6. ¬ (IsSupersonic A)	
7. ¬ (MeetMNPS B)	
8. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ 120	
9. ¬ (LongitudinallySeparated (A , B))	
10. "LatChange Per10DLong LessThanOrEq3" A	
11. "LatChange Per10DLong LessThanOrEq3" B	
12. IsOutsideMNPSAirspace A	
13. IsOutsideMNPSAirspace B	
14. IsOnRoute Routes2 A	

–Test Frame 154(7):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B))	1. ¬ ("are separated" (A , B))
2. 80 < "RouteSegment Degrees" A	
3. 80 < "RouteSegment Degrees" B	
4. IsOutsideMNPSAirspace A	
5. IsOutsideMNPSAirspace B	
6. IsOnRoute Routes1 A	
7. IsOnRoute Routes1 B	
8. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ 90	
9. ¬ (LongitudinallySeparated (A , B))	
10. "LatChange Per10DLong LessThanOrEq3" A	
11. "LatChange Per10DLong LessThanOrEq3" B	
12. ¬ (IsWestOf55W B)	

–Test Frame 155(8):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 80 < "RouteSegment Degrees" A 3. 80 < "RouteSegment Degrees" B 4. ¬ (IsOnRoute Routes2 A) 5. FlightLevel A ≤ 275 6. ¬ (MeetMNPS A) 7. ABS (LateralPositionInMiles A − LateralPositionInMiles B) ≤ 120 8. ¬ (LongitudinallySeparated (A , B)) 9. "LatChange Per10DLong LessThanOrEq3" A 10. "LatChange Per10DLong LessThanOrEq3" B 11. IsOutsideMNPSAirspace A 12. IsOutsideMNPSAirspace B 13. IsOnRoute Routes2 B	1. ¬ ("are separated" (A , B))

–Test Frame 156(1):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 70 ≤ "RouteSegment Degrees" A 3. "RouteSegment Degrees" A ≤ 80 4. "LatChange Per10DLong LessThanOrEq1" A 5. "LatChange Per10DLong LessThanOrEq1" B 6. ¬ (IsOnRoute Routes1 B) 7. ¬ (IsWestOf55W B) 8. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 1 9. FlightLevel A ≤ 275 10. MeetMNPS A 11. MeetMNPS B 12. HavePartOfRouteInMNPSAirspace A 13. HavePartOfRouteInMNPSAirspace B 14. ¬ (LongitudinallySeparated (A , B)) 15. "RouteSegment Degrees" B < 70	1. ¬ ("are separated" (A , B))

–Test Frame 157(2):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B))	1. ¬ ("are separated" (A , B))
2. 70 ≤ "RouteSegment Degrees" A	
3. "RouteSegment Degrees" A ≤ 80	
4. "LatChange Per10DLong LessThanOrEq1" A	
5. "LatChange Per10DLong LessThanOrEq1" B	
6. IsOutsideMNPSAirspace A	
7. IsOutsideMNPSAirspace B	
8. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 1.5	
9. IsOnRoute Routes2 A	
10. IsOnRoute Routes2 B	
11. IsWestOf55W A	
12. IsWestOf55W B	
13. ¬ (LongitudinallySeparated (A , B))	
14. "RouteSegment Degrees" B < 70	

–Test Frame 158(3):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B))	1. ¬ ("are separated" (A , B))
2. 70 ≤ "RouteSegment Degrees" A	
3. "RouteSegment Degrees" A ≤ 80	
4. "LatChange Per10DLong LessThanOrEq1" A	
5. "LatChange Per10DLong LessThanOrEq1" B	
6. ¬ (IsOnRoute Routes1 A)	
7. ¬ (IsWestOf55W A)	
8. IsSupersonic A	
9. IsSupersonic B	
10. 275 < FlightLevel A	
11. 275 < FlightLevel B	
12. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 1	
13. ¬ (LongitudinallySeparated (A , B))	
14. "RouteSegment Degrees" B < 70	

–Test Frame 159(4):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B))	1. ¬ ("are separated" (A , B))
2. 70 ≤ "RouteSegment Degrees" A	
3. "RouteSegment Degrees" A ≤ 80	
4. "LatChange Per10DLong LessThanOrEq1" A	
5. "LatChange Per10DLong LessThanOrEq1" B	
6. ¬ (IsOutsideMNPSAirspace B)	
7. FlightLevel B ≤ 275	
8. ¬ (HavePartOfRouteInMNPSAirspace B)	
9. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 2	
10. ¬ (LongitudinallySeparated (A , B))	
11. "RouteSegment Degrees" B < 70	
12. IsOutsideMNPSAirspace A	
13. IsOnRoute Routes1 B	

–Test Frame 160(5):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B))	1. ¬ ("are separated" (A , B))
2. 70 ≤ "RouteSegment Degrees" A	
3. "RouteSegment Degrees" A ≤ 80	
4. "LatChange Per10DLong LessThanOrEq1" A	
5. "LatChange Per10DLong LessThanOrEq1" B	
6. ¬ (IsOutsideMNPSAirspace A)	
7. ¬ (IsSupersonic B)	
8. ¬ (HavePartOfRouteInMNPSAirspace A)	
9. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 2	
10. ¬ (LongitudinallySeparated (A , B))	
11. "RouteSegment Degrees" B < 70	
12. IsOutsideMNPSAirspace B	
13. IsOnRoute Routes1 B	

–Test Frame 161(6):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B))	1. ¬ ("are separated" (A , B))
2. 70 ≤ "RouteSegment Degrees" A	
3. "RouteSegment Degrees" A ≤ 80	
4. "LatChange Per10DLong LessThanOrEq1" A	
5. "LatChange Per10DLong LessThanOrEq1" B	
6. ¬ (IsOnRoute Routes1 B)	
7. ¬ (IsOnRoute Routes2 B)	
8. ¬ (IsSupersonic A)	
9. ¬ (MeetMNPS B)	
10. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 2	
11. ¬ (LongitudinallySeparated (A , B))	
12. "RouteSegment Degrees" B < 70	
13. IsOutsideMNPSAirspace A	
14. IsOutsideMNPSAirspace B	
15. IsOnRoute Routes2 A	

–Test Frame 162(7):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B))	1. ¬ ("are separated" (A , B))
2. 70 ≤ "RouteSegment Degrees" A	
3. "RouteSegment Degrees" A ≤ 80	
4. "LatChange Per10DLong LessThanOrEq1" A	
5. "LatChange Per10DLong LessThanOrEq1" B	
6. IsOutsideMNPSAirspace A	
7. IsOutsideMNPSAirspace B	
8. IsOnRoute Routes1 A	
9. IsOnRoute Routes1 B	
10. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 1.5	
11. ¬ (LongitudinallySeparated (A , B))	
12. "RouteSegment Degrees" B < 70	
13. ¬ (IsWestOf55W B)	

–Test Frame 163(8):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. 70 ≤ "RouteSegment Degrees" A 3. "RouteSegment Degrees" A ≤ 80 4. "LatChange Per10DLong LessThanOrEq1" A 5. "LatChange Per10DLong LessThanOrEq1" B 6. ¬ (IsOnRoute Routes2 A) 7. FlightLevel A ≤ 275 8. ¬ (MeetMNPS A) 9. ABS (LateralPositionInDegrees A − LateralPositionInDegrees B) ≤ 2 10. ¬ (LongitudinallySeparated (A , B)) 11. "RouteSegment Degrees" B < 70 12. IsOutsideMNPSAirspace A 13. IsOutsideMNPSAirspace B 14. IsOnRoute Routes2 B	1. ¬ ("are separated" (A , B))

D.2.3 Longitudinal Separation

–Test Frame 164(1):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. IsSupersonic A 5. IsSupersonic B 6. IsLevel A 7. IsLevel B 8. SameMachNumber (A , B) 9. "SameOr Diverging Tracks" (A , B) 10. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 10 11. "Appropriate TimeSep AtCommon Point" (A , B)	1. ¬ ("are separated" (A , B))

–Test Frame 165(2):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 4. ¬ (IsSupersonic B) 5. IsTurbojet A 6. IsTurbojet B 7. StartTime ("turbojetOppDir NoLongSepPeriod" (A , B)) ≤ "separation check time" 8. "separation check time" ≤ EndTime ("turbojetOppDir NoLongSepPeriod" (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 166(3):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. ¬ (IsSupersonic A) 5. ¬ (IsTurbojet B) 6. ¬ ("SameOr Diverging Tracks" (A , B)) 7. IsOnRoute Routes3 A 8. IsOnRoute Routes3 B 9. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 20	1. ¬ ("are separated" (A , B))

–Test Frame 167(4):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 4. ReportedOverCommonPoint (A , B) 5. ept (A , B) ≤ "separation check time" 6. ¬ (IsTurbojet A) 7. "separation check time" ≤ ept (A , B) + 10	1. ¬ ("are separated" (A , B))

–Test Frame 168(5):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B) 4. ¬ (ReportedOverCommonPoint (A , B)) 5. ept (A , B) − 15 ≤ "separation check time" 6. ¬ (IsTurbojet B) 7. "separation check time" ≤ ept (A , B) + 15	1. ¬ ("are separated" (A , B))

–Test Frame 169(6):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. IsSupersonic A 5. IsSupersonic B 6. SameType (A , B) 7. InCruiseClimb A 8. InCruiseClimb B 9. "SameOr Diverging Tracks" (A , B) 10. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 10 11. "Appropriate TimeSep AtCommon Point" (A , B) 12. ¬ (SameMachNumber (A , B))	1. ¬ ("are separated" (A , B))

–Test Frame 170(7):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. IsSupersonic A 5. IsSupersonic B 6. ¬ (SameMachNumber (A , B)) 7. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 15 8. ReportedOverCommonPoint (A , B) 9. IsLevel A 10. IsLevel B	1. ¬ ("are separated" (A , B))

–Test Frame 171(8):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. IsSupersonic A 5. IsSupersonic B 6. ¬ (IsLevel B) 7. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 15 8. ReportedOverCommonPoint (A , B) 9. IsLevel A 10. SameMachNumber (A , B)	1. ¬ ("are separated" (A , B))

–Test Frame 172(9):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. IsSupersonic A 5. IsSupersonic B 6. ¬ (IsLevel A) 7. ¬ (SameType (A , B)) 8. ABS (TimeAtPosition A − TimeAtPosition B) $\leq$ 15 9. ReportedOverCommonPoint (A , B) 10. IsLevel B 11. SameMachNumber (A , B)	1. ¬ ("are separated" (A , B))

–Test Frame 173(10):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. ¬ (IsSupersonic B) 5. ¬ (IsTurbojet B) 6. ¬ ("SameOr Diverging Tracks" (A , B)) 7. ¬ (IsOnRoute Routes3 B) 8. ABS (TimeAtPosition A − TimeAtPosition B) $\leq$ 30 9. IsOnRoute Routes3 A	1. ¬ ("are separated" (A , B))

–Test Frame 174(11):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. ¬ (IsSupersonic B) 5. IsTurbojet A 6. IsTurbojet B 7. ABS (TimeAtPosition A − TimeAtPosition B) ≤ "turbojetSameDir LongSep" (A , B)	1. ¬ ("are separated" (A , B))

–Test Frame 175(12):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. ¬ (IsSupersonic B) 5. ¬ (IsTurbojet B) 6. ¬ ("SameOr Diverging Tracks" (A , B)) 7. ¬ (IsOnRoute Routes3 A) 8. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 30 9. IsOnRoute Routes3 B	1. ¬ ("are separated" (A , B))

–Test Frame 176(13):

Stimuli	Response
1. ¬ (VerticallySeparated (A , B)) 2. ¬ (LaterallySeparated (A , B)) 3. ¬ (AngularDifferenceGreaterThan90Degrees (RouteSegment A , RouteSegment B)) 4. IsSupersonic A 5. IsSupersonic B 6. ¬ (ReportedOverCommonPoint (A , B)) 7. ¬ ("Appropriate TimeSep AtCommon Point" (A , B)) 8. ABS (TimeAtPosition A − TimeAtPosition B) ≤ 15 9. IsLevel A 10. IsLevel B 11. SameMachNumber (A , B)	1. ¬ ("are separated" (A , B))