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DATA LINK SERVICE DESIGN VALIDATION MICRO STUDY TEST PLAN

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1.0 INTRODUCTION

In response to the National Airspace System (NAS) Plan to provide a digital Data Link between ground based operations and aircraft, a Data Link test bed has been constructed at the FAA Technical Center (FAATC) to support the development of en route Air Traffic Control Data Link services.

The en route Data Link test bed consists of the NAS Host Computer System (HCS) used in conjunction with other support computer systems to provide a realistic simulation facility for the development of operational and procedural concepts of the initial Data Link capabilities.

Two mini studies were conducted at the FAATC Data Link test bed during 1988 to develop an initial set of en route Data Link services. In April of 1989 an operational evaluation of the initial en route Data Link services was performed using Full Performance Level (FPL) Air Traffic Controllers. As a result of this evaluation and subsequent Air Traffic Data Link Validation Team (ATDLVT) meetings, specific enhancements and changes were made to the design of the Data Link services.

Currently a test is needed, using members of the ATDLVT and the FAATC Data Link test bed, to validate the proposed changes and enhancements to the Data Link services.

1.1 PURPOSE

The purpose of the Data Link Service Design Validation Micro Study is to verify and further refine the functional requirements for the initial en route Data Link services. The focus of this test is to address design issues that developed as a result of the Operational Evaluation and meetings of the ATDLVT in Seattle and San Diego.

1.2 OBJECTIVES

The objective of this test is to obtain input from the ATDLVT on design issues pertaining to the initial en route Data Link services and functions. The data collected will be used for input to the ERSDS contract. In addition, this test will be used to enhance the current Data Link test bed for future testing efforts planned for the fall of 1990.

2.0 TEST APPROACH

This test will consist of Data Link test runs that are designed to address specific aspects of the Data Link services. The controller team will be briefed on the Data Link functions to be examined prior to each test session. During testing, each controller will focus on the specific test features to be studied within the

particular test run. To ensure that each design feature is tested, scripted scenarios will be developed and presented to the controller team prior to testing. After every test run, each controller will fill out a questionnaire and provide comments on the specific design issues examined in the test run.

In addition to the questionnaires, a debriefing session will take place following the test runs to discuss specific design issues between the controller team and the engineers.

This test addresses a subset of the functions available in each of the areas below. These functions represent the particular areas that have changed since the operational evaluation. The specific Data Link functions to be tested fall within each of the following categories:

- Transfer of Communication
- Communications Backup Uplink
- Altitude Assignment
- Menu Text

Each test run will focus on specific test items. After all the test items have been individually tested, a final test run will take place to ensure that the services and functions work well together.

3.0 TEST CONDUCT

3.1 TEST SUBJECTS AND SCENARIOS

The four ATDLVT en route design controllers will be used as the test subjects for these tests. These controllers are needed due to their expertise in the Data Link service design. If available, additional ATDLVT team members may take part in the testing as simulation pilots.

In addition to the four controllers, there will be four facilators, one at each sector position, to help with scenario questions and to record comments and help with controller questionnaires.

DYSIM will be used as the pilot simulation method and will be manned by Technical Center personnel and/or ATDLVT controllers. DYSIM was chosen for pilot simulation since it provides an adequate level of realism for validation of the service designs. Four simulation pilots will be required, one for each of the four pilot positions.

Three test scenarios will be used. These scenarios will be the DYSIM version of the scenarios used for the Operational Evaluation. The training scenario will be used to re-familiarize the controller team with the Data Link inputs and displays. Scenario #1, using 70% Data Link equipage, will be used in the specific service validation tests and scenario #2, using 70% Data Link equipage, will be used during full testing of all services on the final day

of the study.

3.2 TEST SCRIPTS

To enable the controllers to validate each Data Link feature in question, scripted scenarios will be provided prior to each test session. These scripts will contain the procedures the controller must follow to properly evaluate each design feature. The scripts will prove to be an integral part of the test procedures since they will guide the controllers through their analysis of the Data Link design issues. Each script to be used in the tests are contained in Appendix A of this report.

Prior to testing, each script will be reviewed with the controller team. Questions and answers will be provided to ensure each controller knows what has to be accomplished in the test session. During testing, facilators, well versed with the scripts, will be present at each sector to help the controllers if there are any further questions.

3.3 DATA COLLECTION

Different methods will be used for collection of data from the ATDLVT members. The first is the use of questionnaires immediately following every test run. Each controller will answer specific questions and provide comments about each design issue. The questionnaires will be completed in the test laboratory at the sector position. Additionally, a facilator, present at each sector position, will be available during and after the tests to record the controller comments and help in case of controller questions. A detailed description of the questionnaires is provided in Appendix B of this report.

After the test runs, the ATDLVT members will be taken to a debriefing room where each design issue will be discussed among the group members and engineering staff. During these discussions the individual questionnaire results collected during the test runs will be presented to the team for discussion among all group members. Upon mutual agreement between the team members and engineering staff, answers to design issues will be resolved. During these discussions, a designated recorder (one of the engineering staff) will take notes and record decisions reached by both groups.

4.0 TEST ITEMS

Contained in the following section is a description of each of the specific design areas to be validated during the test. Included with each item is a description, an input format (if appropriate), and examples of relevant issues to be considered during testing of the item.

4.1 TRANSFER OF COMMUNICATION

4.1.1 AUTOMATIC TRANSFER OF COMMUNICATION

This function allows the controller to automatically uplink a Data Link transfer of communication message to an aircraft upon acceptance of handoff by the receiving sector. The TOC is not placed in a held status as is done during the normal handoff sequence. Instead, it is sent upon handoff acceptance.

Input Format:

Receiving sector number, S, FLID

Relevant Issues:

1. Under what operational situations would this capability be used?

2. Is the input format acceptable?

4.1.2 TRANSFER OF COMMUNICATION SECTOR BYPASS

This capability allows the controller to send Data Link eligibility to another sector regardless of a held Data Link message. If a held Data Link message exists, the capability is provided to send the Data Link eligibility to a sector other than the sector specified in the held Data Link TOC message (the sector specified in the held message is identified by the frequency contained in the status list entry Data area).

In the current design, when an aircraft is handed off to another sector and the initiating sector has Data Link eligibility, the frequency contained in the held Data Link message is the frequency for the sector specified in the initiate handoff message. Subsequently, the Data Link held TOC message is built upon acceptance of track control and the appropriate frequency is contained in the held TOC message.

If track control is handed off to another sector and the initiating sector does not have Data Link eligibility, no TOC message is built.

The following format is used regardless if there is a pending held TOC message or not.

Input Format:

D/L QAK, Sector number, Optional S, FLID

Relevant Issues:

1. How often will this function be needed?

2. Is the sector bypass input action needed or could this activity be accomplished with coordination and procedures using the /OK design?

4.2 COMMUNICATIONS BACKUP UPLINK

4.2.1 RECALL FUNCTION

This Data Link function allows the controller to recall the previously uplinked communications backup message in the preview area of the CRD. Only the most recent communications backup message is recallable. After the controller reviews the message, it may be uplinked to another or the same aircraft.

Input Format to Recall Text:

DL QAK, T, Up Arrow

Input Format to Send Message:

DL QAK, T, FLID

Relevant Issues:

1. Is this the best input sequence?

2. If the controller knows what was previously uplinked can the step to recall be eliminated?

4.2.2 STATUS LIST WIDTH AND NUMBER OF LINES

The status list data field may have a variable number of characters and lines. The default during previous evaluations has been six characters and one line. These defaults have been insufficient for some communications backup uplink messages.

Relevant Issues:

1. What are the best default values for the number of characters and lines in the data field of the status list entry?

4.3 ALTITUDE ASSIGNMENT

4.3.1 FAILED MESSAGES

Bolding, or double bright, of the Full Data Block and the Status List Entries is used as a generic failure indication which tells the controller that a Data Link message has failed.

Relevant Issues:

1. Is the Full Data Block bold indication acceptable?

2. Is the status list entry quickly identifiable?

3. Will this method of identifying failed messages work for all the initial Data Link services? What about future services?

4. What other displays could be used for a generic fail indication?

4.3.2 TIMESHARE FEATURE/FAILURE INDICATION

This Data Link display feature timeshares the uplinked altitude and status of the Data Link transaction with the altitude and conformance indicator currently displayed in the full data block. The previous design featured the uplinked altitude and transaction status displayed in place of the currently assigned altitude and conformance indicator.

Additionally, if the Data Link transaction Fails, the uplinked altitude and the word FAIL are timeshared with the currently displayed altitude, conformance indicator, and Mode C altitude.

Relevant Issues:

1. Is the timesharing of this data appropriate? Does the data block become too cluttered?

2. Is the timeshare interval acceptable? What is an acceptable timshare interval?

3. Does the word FAIL during an altitude transaction failure obstruct the Mode C data to an unacceptable level? Is the whole word FAIL necessary? Are the generic failure indications sufficient to indicate that the message has failed?

4.4 MENU TEXT

4.4.1 Z MENU ENTRY

The Z menu entry allows the controller to uplink the altitude currently displayed in the full data block. This was done to accommodate the Cleveland Air Route Traffic Control Center (ARTCC). The special case occurs when track control handoff has occurred but the controller is still in contact with the aircraft via voice and Data Link. The controller with track control updates the aircraft full data block by entering the new altitude into the Host

Computer. The controller with voice and Data Link eligibility uplinks, via Data Link, the altitude using the Z menu entry.

Relevant Issues:

1. Can the controller with track control change the altitude in the full data block prior to issuing the clearance?

2. What if the Z menu entry Fails? The data block contains the wrong altitude.

3. Can this function be used to confirm an altitude assignment?

4.4.2 MENU TEXT VARIABLE FIELD

This input action allows the controller to change the altitude field in a menu text entry for a single uplink (substitution) or for all subsequent uplinks (menu change). This capability is necessary to allow the controller to change the critical data in a menu text message at the sector position.

Note that variable field substitutions are only valid for menu text entries which update the database and full data block.

Input Format for a single uplink (substitution):

QQ, Menu Text Message Referent, Substitute Altitude, FLID

Input Format for a menu change:

DL QAK, Menu Change CRD Input, Menu Text Message Referent, New Altitude

Relevant Issues:

1. Are the input formats acceptable? How should they be changed?

2. Originally, certain menu text entries were designated to update or not update the NAS database and full data block. Since menu text has the capability to automatically update the NAS database and the full data block, why don't all menu text entries update?

4.4.3 MENU TEXT SUPPRESSION

This Data Link input action enables the controller to suppress the display of any menu text entries on the PVD display. This capability is available to reduce clutter in the menu text on the PVD.

Input Format:

DL QAK, Menu Suppress CRD Input, Menu Text Message Referent

Relevant Issues:

1. Should there be an input action that displays only one suppressed menu text entry? Currently, the only way to unsupress a menu text entry that has been suppressed is to use the return to default action.

4.4.4 MENU TEXT RETURN TO DEFAULT

This Data Link input action will enable the controller to return all menu text variable field entries to their default values (i.e., the values assigned when the menu text was built at the supervisory position). In addition, this input action will display all menu text entries assigned to the sector position and deletes any indication of a suppressed menu text entry.

Input Format:

DL QAK, Menu Return To Default CRD Input

Relevant Issues:

1. Are the input actions acceptable?

2. Should this action perform both redisplaying suppressed menu entries and returning the default menu text altitudes? Should these functions have different inputs?

4.4.5 MENU TEXT ENTRIES, CLASSIFICATION

During the operational evaluation only interim altitude menu text entries were used. Now the design allows a menu entry to be assigned to a current NAS function. In this test two types of menu text entries are included, interim altitude and communications backup entries.

Input Format for interim altitude menu text entries:

QQ, Menu Text Message Referent, FLID

Input Format for communications backup menu text entries:

DL QAK, Menu Text Message Referent, FLID

Relevant Issues:

1. How does the controller distinguish between different types of menu text entries?

2. What other services can be used with menu text?

5.0 TEST SCHEDULE

Day 1

Test Plan Overview	1 Hr
Objectives of the First Run	1/3 Hr
Airspace Familiarization (Scenario #1)	1/3 Hr
Scripted Scenario Briefing	1/3 Hr
First Test Bed Run	
Training Run (Training Scenario)	1 Hr
Transfer of Communication (Scenario #1)	1 Hr
Communications Backup Uplink (Scenario #1)	1 Hr
Debriefing and Discussion	3 Hr

Day 2

Objectives of the Second Run	1/3 Hr
Scripted Scenario Briefing	1/3 Hr
Second Test Bed Run	
Altitude Assignment/Failures (Scenario #1)	1 Hr
Menu Text (Scenario #1)	2 Hr
Debriefing and Discussion	3 Hr
CDI Discussions	1 Hr
Airspace Familiarization (Scenario #2)	1/3 Hr

Day 3

Third Test Bed Run	
Full Testing of All Services (Scenario #2)	2 Hr
Discussion and Wrap-up of Testing	1 Hr
Narrative/Discussion of Fall Test Items	2 Hr
Review of Downlink Design	2 Hr
CDI Discussions	2 Hr

APPENDIX A

TEST SCRIPTS

A.1 INTRODUCTION

The purpose of the test scripts is to provide a structured exercise, during the Data Link scenario runs, to enable the controller team to focus on the specific Data Link service and function issues. There are ten different events that are designed to direct the controller's attention on specific design features of Data Link. Each scripted event contains a purpose, and instructions on how to conduct the event. Before the start of a scenario run, the scripted events to be conducted during the scenario run will be read and understood by all participates.

A.2 AUTOMATIC TRANSFER OF COMMUNICATION

A.2.1 PURPOSE

To validate the design of the Automatic Transfer of Communication.

A.2.2 SCRIPT

Initiating Sector	(1)	Use the input sequence (Sector Number, S, FLID) to initiate: (1) a handoff of a Data Link eligible aircraft to the next sector and (2) an automatic uplink of the TOC message upon receipt of track control.
Receiving Sector	(1)	Accept the handoff of the aircraft in handoff status.
Initiating Sector	(1)	Observe that the Status List contains no HELD TOC message. Instead, observe that the TOC message contains a SENT status for that aircraft.
	(2)	When the SIM pilot WILCOs the TOC message, observe the changes to the aircraft's DL eligibility symbol (up arrow changes to a diamond.)
Receiving Sector	(1)	Observe the change to the aircraft's DL symbol from an up arrow to an hourglass.

A.3 TRANSFER OF COMMUNICATION SECTOR BYPASS USING "DL /OK" OPTION

A.3.1 PURPOSE

To validate the capability of a sector to acquire Data Link eligibility of an aircraft using "DL /OK" option.

Note: This test requires the participation of controllers at sectors 03, 07, and 10.

A.3.2 SCRIPT

Sector 03	(1)	Coordinate with Sectors 07 and 10 to handoff an aircraft from 03 to 07 to 10.
	(2)	Handoff a Data Link eligible aircraft to Sector 07 but do NOT uplink the TOC message to the aircraft when the handoff is accepted.
Sector 07	(1)	Accept the handoff of the aircraft in handoff status.
	(2)	Immediately handoff the aircraft to Sector 10.
Sector 10	(1)	Accept the handoff of the aircraft in handoff status.
Sector 07	(1)	Coordinate with Sector 03 to switch the aircraft's frequency. And acquire Data Link eligibility of the aircraft (DL key, /OK, FLID).
Sector 03	(1)	Using voice, instruct the pilot to switch to Sector 07's frequency.
Sector 10	(1)	Coordinate with Sector 07 to acquire Data Link eligibility of the aircraft. Then, send the TOC message to the aircraft (DL key, /OK, S, FLID).

A.4 TRANSFER OF COMMUNICATION SECTOR BYPASS USING "DL /OK" OPTION

A.4.1 PURPOSE

To validate the capability of a sector to acquire Data Link eligibility of an aircraft using "DL /OK" option.

Note: This test requires the participation of controllers at sectors 17, 10, and 07.

A.4.2 SCRIPT

Sector 17	(1)	Coordinate with Sectors 07 and 10 to handoff an aircraft from 17 to 10 to 07.
	(2)	Handoff a Data Link eligible aircraft to Sector 10 but do NOT uplink the TOC message to the aircraft when the handoff is accepted.
Sector 10	(1)	Accept the handoff of the aircraft in handoff status.
	(2)	Immediately handoff the aircraft to Sector 07.
Sector 07	(1)	Accept the handoff of the aircraft in handoff status.
Sector 10	(1)	Coordinate with Sector 17 to have the aircraft's frequency switched to your frequency. Then, acquire Data Link eligibility of the aircraft (DL key, /OK, FLID).
Sector 17	(1)	Using voice, instruct the pilot to switch to Sector 10's frequency.
Sector 07	(1)	Coordinate with Sector 10 to acquire Data Link eligibility of the aircraft. Then, send the TOC message to the aircraft (DL key, /OK, S, FLID).

A.5 TRANSFER OF COMMUNICATION SECTOR BYPASS NOT USING "DL /OK" OPTION

A.5.1 PURPOSE

To validate the capability of a sector to send Data Link eligibility to another sector and uplink a TOC message to the aircraft.

Note: This test requires the participation of controllers at sectors 03, 07, and 10.

A.5.2 SCRIPT

Sector 03	(1)	Coordinate with Sectors 07 and 10 to handoff an aircraft from 03 to 07 to 10.
	(2)	Handoff a Data Link eligible aircraft to Sector 07 but do NOT uplink the TOC message to the aircraft when the handoff is accepted.
Sector 07	(1)	Accept the handoff of the aircraft in handoff status.
	(2)	Immediately handoff the aircraft to Sector 10.
Sector 10	(1)	Accept the handoff of the aircraft in handoff status.
Sector 07	(1)	Coordinate with Sector 03 to switch the aircraft's frequency and send Data Link eligibility to your sector.
Sector 03	(1)	Using voice, instruct the pilot to switch frequency to Sector 07's frequency. Then, send Data Link eligibility to Sector 07 (DL key, Sector Number, FLID).
Sector 10	(1)	Coordinate with Sector 07 to have the Data Link eligibility for the aircraft sent to your sector.
Sector 07	(1)	Send the Data Link eligibility for the aircraft to Sector 10 and uplink the TOC message to the aircraft (DL key, Sector Number, S, FLID).

A.6 TRANSFER OF COMMUNICATION SECTOR BYPASS NOT USING "DL /OK" OPTION

A.6.1 PURPOSE

To validate the capability of a sector to send Data Link eligibility to another sector and uplink a TOC message to the aircraft.

Note: This test requires the participation of controllers at sectors 17, 10, and 07.

A.6.2 SCRIPTS

Sector 17	(1)	Coordinate with Sectors 07 and 10 to handoff a aircraft from 17 to 10 to 07.
	(2)	Handoff a Data Link eligible aircraft to Sector 10 but do NOT uplink the TOC message to the aircraft when the handoff is accepted.
Sector 10	(1)	Accept the handoff of the aircraft in handoff status.
	(2)	Immediately handoff the aircraft to Sector 07.
Sector 07	(1)	Accept the handoff of the aircraft in handoff status.
Sector 10	(1)	Coordinate with Sector 17 to switch the aircraft's frequency and send Data Link eligibility to your sector.
Sector 17	(1)	Using voice, instruct the pilot to switch frequency to Sector 10's frequency. Then, send Data Link eligibility to Sector 10 (DL key, Sector Number, FLID).
Sector 07	(1)	Coordinate with Sector 10 to have the Data Link eligibility for the aircraft sent to your sector.
Sector 10	(1)	Send the Data Link eligibility to Sector 07 and uplink the TOC message to the aircraft (DL key, Sector Number, S, FLID).

A.7 COMMUNICATIONS BACKUP UPLINK/STATUS LIST WIDTH AND LINES

A.7.1 PURPOSE

To validate the Communications Backup Uplink Recall function and the capability to uplink the recalled message to an aircraft.

To validate the use of the Data Link Status List with variable data field widths and multiple lines.

A.7.2 SCRIPTS

Controller

(1) Identify the aircraft that is to receive the Data Link message.

(2) Enter the following inputs: DL key, T, Check For Stuck Mike, FLID; to compose the free message. Then, depress the keyboard ENTER key to uplink the message to the aircraft.

(3) Observe the uplinked the message in the Status List.

(4) After the message is WILCOed, recall the uplinked message (DL key, T, Up Arrow).

(5) Observed the recalled message in CRD.

(6) Resend the recalled message to a different aircraft (DL key, T, FLID).

(7) Observe the uplinked the message in the Status List.

Controller

(1) Send different types of Data Link messages (especially long free text messages) to various aircraft.

(2) Observed the display of the messages in the Status List.

A.8 ALTITUDE ASSIGNMENT AND FAILED DATA LINK MESSAGE

A.8.1 PURPOSE

To validate the timeshare feature of an uplink altitude and the Data Link transaction status with the altitude and conformance indicator in the Full Data Block.

To validate the second line of the FDB format for Failed altitude messages.

To validate the technique used to emphasize a failed Data Link message (Bolding of the FBD and Status List entry).

A.8.2 SCRIPTS

Controller:

(1) Uplink an altitude assignment message to a Data Link eligible aircraft.

(2) Observe the timesharing of the uplinked altitude assignment and the Data Link transaction status (i.e., S) with the altitude and conformance indicator in the FBD.

(3) After the pilot WILCOs the message, repeat the above two steps and continue with the steps below.

Facilitator:

(1) Note the aircraft ID of the aircraft that is to receive the uplink message.

(2) Inform the appropriate SIM pilot of the aircraft ID for which a failed response is to be made.

Controller:

(1) Observe the timesharing of the uplinked altitude assignment and the word FAIL with the altitude, conformance indicator and the Mode C altitude in the FBD.

(2) Observed the emphasizing of the FDB and the message in the Status List.

(3) Delete the failed Data Link message from the Status List (D, Trackball Failed Message in Status List).

A.9 Z MENU TEXT ENTRY

A.9.1 PURPOSE

To validate the design of the Z Menu Text entry.

Note: Coordinate with an adjacent sector before conducting this test.

A.9.2 SCRIPTS

Initiating Sector	(1)	Handoff a Data Link eligible aircraft to an adjacent sector but do NOT uplink the TOC message to the aircraft when the handoff is accepted.
Receiving Sector	(1)	Accept the handoff of the aircraft in handoff status.
	(2)	Coordinate with the initiating controller to change the altitude of the aircraft by sending a new altitude to the pilot.
	(3)	Update the FDB of the aircraft with the new altitude.
Initiating Sector	(1)	Using the Z Menu Text entry (QQ, Z, FLID) uplink the new altitude assignment to the aircraft.
	(2)	Uplink the TOC message to the pilot.

A.10 CHANGE AN INTERIM ALTITUDE MENU TEXT VARIABLE FIELD AND RETURN THE VARIABLE FIELD(S) TO DEFAULT

A.10.1 PURPOSE

To validate the design to change the altitude field in a menu text entry for a single uplink (substitution).

To validate the design to change the altitude field in a menu text entry for a single uplink (substitution).

To validate the design that allows all Menu Text variable field entries to be returned to their default values.

A.10.2 SCRIPTS

Controller:

(1) Identify an Interim Altitude Menu Text message (with a leading plus sign) that a substitute altitude value will be made and the entry uplinked to the aircraft.

(2) Enter the desired change to the Menu Text entry (QQ, Menu Text Message Referent, Substitute Altitude Value, FLID). This will also cause the message to be sent to the aircraft.

(3) Observe the substituted altitude in the aircraft FDB.

(4) After the uplinked message is WILCOed, make a permanent change to an Interim Altitude Menu Text message (DL key, Menu Change CRD Input, Menu Text Message Referent, New Altitude Value).

(5) Observed the change to the Menu Text message variable field in the Menu Text list.

(6) Return the variable field(s) in the Menu Text message(s) to their default value(s) (DL key, Menu Text To Default CRD Input).

(7) Observed the change to the variable field in the Menu Text message(s).

A.11 MENU TEXT ENTRIES, CLASSIFICATION

A.11.1 PURPOSE

To validate the design of classifying the Menu Text entries with the type of NAS function selected.

A.11.2 SCRIPTS

Facilitator: (1) Inform the SIM pilot to delay in responding to the uplinked messages in this test. This will give the controller time to look at the messages.

Controller: (1) Uplink an Interim Altitude Menu Text message to a Data Link eligible aircraft (QQ, Menu Text Message Referent, FLID).

(2) Uplink the Communications Backup Menu Text entry (DL key, Menu Text Message Referent, FLID) to another Data Link eligible aircraft.

(3) Observe both Data Link messages in the Data Link Status list.

APPENDIX B

DATA COLLECTION MATERIALS

B.1 INTRODUCTION

The purpose of the Data Link questionnaires is to solicit the opinions of the controllers participating in the Data Link Service Design Validation Micro Study. The questionnaires are designed to ask pertinent questions about the specific Data Link design issues. The questionnaires will be completed by each controller after each test run. If a controller has any questions, a facilitator present at the sector position, will be available to help.

After the test runs and before the group discussions, the questionnaires will be studied and the results compiled into a summary format. The comments and ratings will be presented during the group discussions to allow everyone involved to know how each design issue was rated. The compiled results will be used to stimulate group discussions and help the controllers and engineers to reach a consensus on design issues.

DATA LINK SERVICE DESIGN VALIDATION QUESTIONNAIRE

This questionnaire is designed to obtain feedback from each controller concerning recent software upgrades to the en route data link design. Please circle the rating for each aspect of a design issue. VG=very good, G=good, SG=slightly good, F=fair, SP=slightly poor, P=poor, VP=very poor, ?=undecided or not enough information or not applicable.

Additionally, questions and comment areas are included with each design issue. Please take time to read each question and provide the best answer possible. Also, if you have any further comments or issues which are not included, please write them down in the comment area.

Name_____

Date_____ Sector_____

B.2 AUTOMATIC TRANSFER OF COMMUNICATION

1.	Entries "Receiving Sector Number, S, FLID"	VG	G	SG	F	SP	P	VP	?
2.	FDB indications/status	VG	G	SG	F	SP	P	VP	?
3.	Status list operation	VG	G	SG	F	SP	P	VP	?
4.	Resend operation	VG	G	SG	F	SP	P	VP	?
5.	Block operation	VG	G	SG	F	SP	P	VP	?
6.	Overall Rating	VG	G	SG	F	SP	P	VP	?

When would this be used?_____

Comments_____

B.3 TRANSFER OF COMMUNICATION SECTOR BYPASS

1.	Entries "D/L QAK, Sector Number, Optional S, FLID"	VG	G	SG	F	SP	P	VP	?
2.	FDB indications/status	VG	G	SG	F	SP	P	VP	?
3.	Status list operation	VG	G	SG	F	SP	P	VP	?
4.	Resend operation	VG	G	SG	F	SP	P	VP	?
5.	Block operation	VG	G	SG	F	SP	P	VP	?
6.	Overall Rating	VG	G	SG	F	SP	P	VP	?

Are both methods (DL /OK and Sector Bypass) needed? _____

_____

Do you prefer one method over the other? Why?_____

_____

_____

Can one method be used and the process be governed by procedures?

_____

_____

Comments_____

_____

_____

B.4 COMMUNICATIONS BACKUP - RECALL FUNCTION

1.	Recall entries "DL T Up Arrow"	VG	G	SG	F	SP	P	VP	?
2.	Send entries "DL T FLID"	VG	G	SG	F	SP	P	VP	?
3.	FDB indications/status	VG	G	SG	F	SP	P	VP	?
4.	Status list operation	VG	G	SG	F	SP	P	VP	?
5.	Resend operation	VG	G	SG	F	SP	P	VP	?
6.	Block operation	VG	G	SG	F	SP	P	VP	?
7.	Overall Rating	VG	G	SG	F	SP	P	VP	?

If the controller knows what was previously uplinked, can the recall step be eliminated? _____

_____

Comments_____

_____

_____

B.5 STATUS LIST WIDTH

What are the best default values for the number of characters and lines in the data field of the status list entry? _____

_____

Should different types of Data Link messages (i.e., by service) have different field widths and number of lines? _____

_____

Comments_____

_____

Any other ideas from today's tests?_____

_____

_____

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B.6 TIMESHARE FEATURE

1.	FDB indications/status	VG	G	SG	F	SP	P	VP	?
2.	Status list operation	VG	G	SG	F	SP	P	VP	?
3.	Resend operation	VG	G	SG	F	SP	P	VP	?
4.	Block operation	VG	G	SG	F	SP	P	VP	?
5.	Overall Rating	VG	G	SG	F	SP	P	VP	?

Is the timeshare interval acceptable? What interval would you suggest? _____

_____

Is the data being timeshared correct? Other suggestions?_____

_____

_____

Is the altitude Failure indication acceptable? Should anything be changed? _____

_____

_____

Comments_____

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B.7 FAILED MESSAGES

1.	FDB indications/status	VG	G	SG	F	SP	P	VP	?
2.	Status list operation	VG	G	SG	F	SP	P	VP	?
3.	Resend operation	VG	G	SG	F	SP	P	VP	?
4.	Block operation	VG	G	SG	F	SP	P	VP	?
5.	Overall Rating	VG	G	SG	F	SP	P	VP	?

Is the Full Data Block bold indication acceptable? _____

_____

Is the status list entry quickly identifiable? _____

_____

What other Failure indications would you suggest? _____

_____

_____

Is the Fail indication good for all services?_____

_____

_____

Comments_____

_____

_____

B.7 Z MENU ENTRY

1.	Entries "Z FLID"	VG	G	SG	F	SP	P	VP	?
2.	FDB indications/status	VG	G	SG	F	SP	P	VP	?
3.	Status list operation	VG	G	SG	F	SP	P	VP	?
4.	Resend operation	VG	G	SG	F	SP	P	VP	?
5.	Block operation	VG	G	SG	F	SP	P	VP	?
6.	Overall Rating	VG	G	SG	F	SP	P	VP	?

Can the controller with track control change the altitude in the full data block prior to issuing the clearance?_____

_____

_____

What if the Z menu entry fails? The data block contains the wrong altitude._____

_____

Can this function be used to confirm an altitude assignment?_____

_____

Comments_____

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B.8 MENU TEXT VARIABLE FIELD

B.8.1 VARIABLE FIELD SUBSTITUTION

1. Entries "QQ, Menu Text Message Referent, Substitute Altitude, FLID"

	VG	G	SG	F	SP	P	VP	?
2. FDB indications/status	VG	G	SG	F	SP	P	VP	?
3. Status list operation	VG	G	SG	F	SP	P	VP	?
4. Resend operation	VG	G	SG	F	SP	P	VP	?
5. Block operation	VG	G	SG	F	SP	P	VP	?
6. Overall Rating	VG	G	SG	F	SP	P	VP	?

Comment_____

_____

_____

B.8.2 CHANGE A MENU ENTRY

Entries "D/L QAK, Menu Change CRD Input, Menu Text Message Referent, New Altitude"

VG	G	SG	F	SP	P	VP	?

Comment_____

_____

B.9 MENU SUPPRESSION AND RETURN TO DEFAULT

B.9.1 MENU TEXT SUPPRESSION

Entries "D/L QAK, Menu Suppress CRD Input, Menu Text Message Referent" VG G SG F SP P VP ?

Should there be an input action that displays only one suppressed menu text entry? Currently, the only way to unsuppress a menu text entry that has been suppressed is to use the return to default action. _____

_____

Comment_____

_____

B.9.2 MENU TEXT RETURN TO DEFAULT

Entries "D/L QAK, Menu Return To Default CRD Input"

VG G SG F SP P VP ?

Should this action perform both redisplaying suppressed menu entries and returning the default menu text altitudes? Should these functions have different inputs? _____

_____

Comments_____

_____

B.10 MENU TEXT ENTRIES CLASSIFICATION

Entries "QQ, Interim Altitude, FLID"

VG G SG F SP P VP ?

How will the controller distinguish between different types of menu text entries? _____

_____

_____

Comments_____

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Any other ideas from today's tests?_____

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