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ADST
Operations Manual
AIRNET
Digital Message Communications Console

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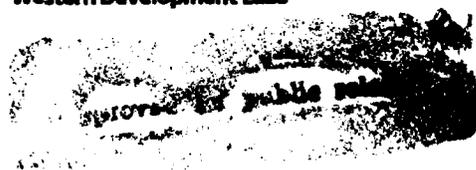
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13. ABSTRACT (Maximum 200 words)

The Operations Manual for the AIRNET Digital Message Communications Console describes the end user operational procedures for the AIRNET DMCC

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1. Overview of the Digital Message Communications Console

The Digital Message Communications Console allows a simulation participant to send and receive preformatted and free text digital messages. These messages may be sent between DMCC consoles or sent to and/or received from other digital messaging entities which share the DMCC SIMNET and DIS communications protocol. Up to 8 DMCC terminals may be connected to each DMCC workstation platform. The DMCC terminals may receive messages from other DMCC terminals and also from other simulation entities. Each DMCC may receive messages from any number of senders, within the limitations of the network.
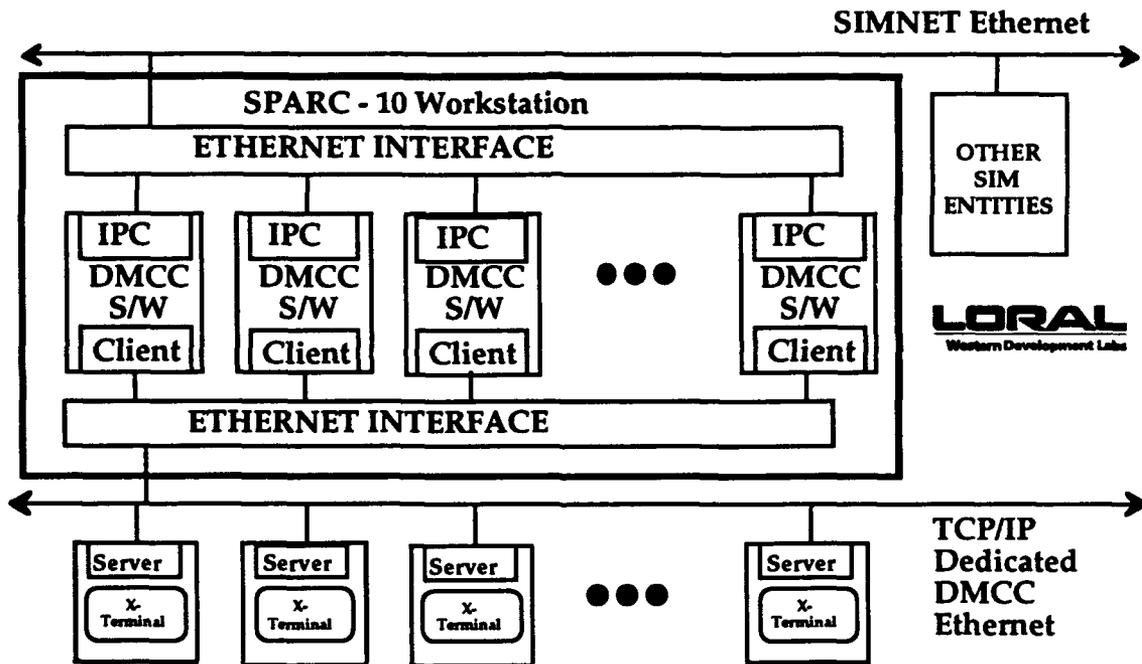
Figure 1   Software and Hardware Architecture

2. Operational Concept of the Digital Message Communications Console

Digital Messaging allows you to assemble, dispatch, receive, store, access and retrieve messages quickly and reliably. It increases your war fighting effectiveness by freeing you from the need to take extra time for voice communications, and by allowing your messages to be formatted for maximum informational content clarity. Digital Messaging increases the war fighting effectiveness of the soldier and the team.

The Digital Message Communications Console simulates generically the types of fixed and vehicular equipment used to assemble, dispatch, receive, store, access, and retrieve digital messages.

The DMCC forms a foundation for exploring the appropriateness of various battlefield digital messaging paradigms as well as provides a tool for team tactics training.

3.   Description of OSF Motif® and the X-Windows System

The Digital Message Communications Console uses the Open Software Foundation (OSF®) implementation of a graphical user interface called Motif®, which runs in a windowing environment called X-Windows, which is sometimes referred to as just X.

Motif windows are regions of the computer display screen which can contain text, graphics, and objects such as simulated buttons and switches. The windowing system allows users to interact with the DMCC software in an intuitive, simple manner, avoiding much of the difficulty associated with operating software without such a user interface.

The DMCC software uses a number of different windows to allow the user to do different functions. DMCC windows allow for

- Interactive logon, display of message queues or lists, display of the messages themselves

- Creation of lists of addresses for messages, lists of groups to which individual DMCC participants may elect to belong to, and lists of locations referred to in some messages

- Preparation, addressing, and tramsmission of outgoing pre-formatted and free-text messages

The user interacts with the windows environment by typing text, clicking on virtual control "buttons" or "switches" with the mouse, and by changing which window is active.

Only the left button of the three-button mouse device is used in the DMCC.

Only one window is active at any one time; sometimes it is said that the user is "in" that window at that time.

The following diagram illustrates the DMCC windowing system by showing bubbles for each of the different windows in the DMCC software, and arrows to

show the control pathways between the various active windows. Notations on the arrows show what switch action causes the software to transfer control among the windows.

DMCC WINDOW TOPOLOGY
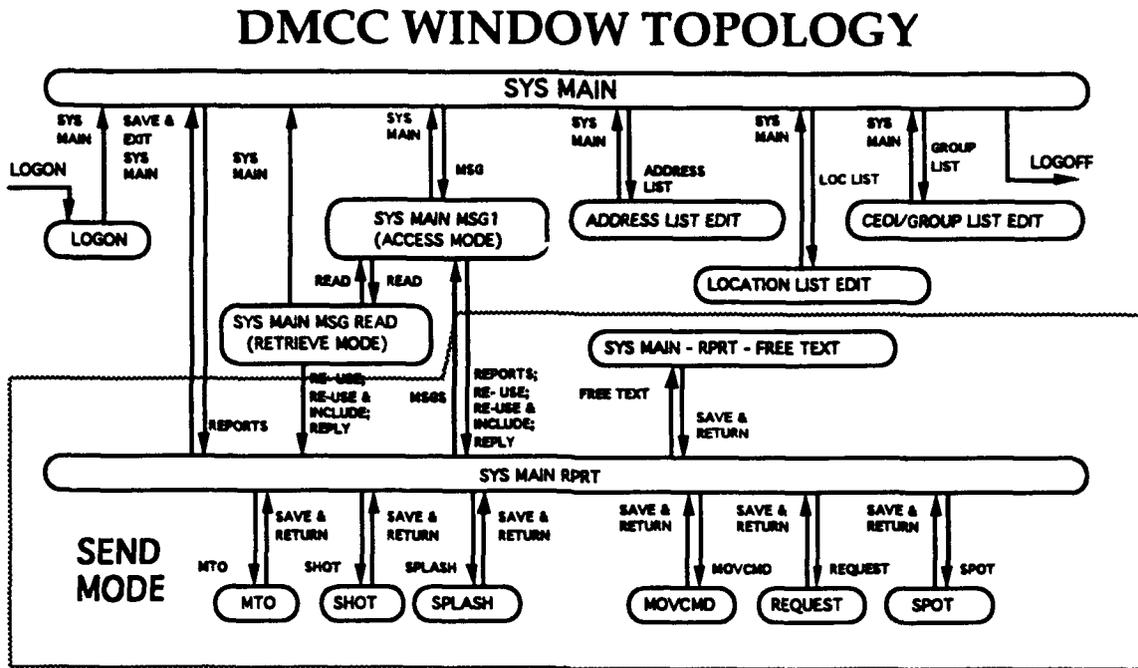
Figure 2   DMCC Window Topology

4.   Description of the DMCC Displays

The main DMCC display window contains three parts, which emulate the appearance and functionality of the message subfunction of a RAH-66 Comanche helicopter mission equipment package. These three parts include eight "buttons" called Tactile Message Indicators (TMI), the Situation Management Display, (SMD) and the Cockpit Interactive Keyboard (CIK). Please refer to Appendix C to view pictures of these windows.

The TMIs are used for different functions depending upon what window is active.

The SMD contains display information and regions of the screen called button switches which emulate the button switches on the frame of a helicopter graphical display system.

The CIK contains two 23 character fields for hand entry of text.

5.   DMCC Window Types

The DMCC has windows for six different purposes, including

     (1) Logon and Setup
     (2) Message Queue Access
     (3) Message Access/Deletion
     (4) Message Retrieval
     (5) Message Forwarding
     (6) Report Preparation and Transmission

6.   Operations: Logging On to the Digital Message Console

The following instructions assume that the Sun workstation and X-terminals have been configured and operational. For instructions on this procedure, your System Administration should refer to Appendix A of this document.

(1) When you sit down in front of the display terminal, the screen should show a small rectangualar window entitled "Welcome to the Digital Message Control Console."

(2) There is an area for entering a Login Name and a User Password. Hit the carriage return key until the underscore cursor is positioned in front of the Logina Name Entr

(3) Type in the name `dmcc'.

(4) Depress the RETURN key to move the cursor to the Password entry.

(5) Depress the Return key again, since there is no password for this account

(6) After a few seconds, the screen will go blank and the logon window will appear.

(7) Position the cursor in the EXERCISE ID text field and type the exercise ID for the exercise in which you will be participating.

(8) Move the cursor to the LOGON TO NETWORK button and press the mouse button.

(9) You will see the SYS MAIN window. Before you may send digital messages, you must tell the DMCC who you will want to send messages to during the exercise.

7. Operations: List Setup

The Digital Message Communications Console uses three types of lists which may be configured before the exercise. They are the

> (1) Address List - a list of the people or <u>groups you want to be able to send messages to,</u> (this list must be configured prior to the excercise)
>
> (2) the Group List - a list of your CEOI or call sign plus the <u>groups you belong to,</u> and
>
> (3) the Location List - is a list of locations such as way points, landmarks or battle points which you want to refer to in your messages.

Please refer to Appendix C for pictures of these windows.

7.1 The Address List

During an exercise, it would be inconvenient (and would compromise mission effectiveness) to have to manually enter the destinations of each message each time you wanted to send one. Since you will be engaged in simulated battle, you must be able to reliably assemble and dispatch a digital message in the shortest possible time.

Each instantiation of the DMCC maintains a list of people or teams to whom it can send messages. You should set up the list of addresses prior to the start of the exercise, in order to quickly send messages during the exercise. You may change the list during the exercise, but normally you would not want to do this.

For example, you may want to be able to send messages during the exercise to your battalion commander, your wing man, the Fire Support Element, etc. The OPORDS for your mission will include this list. You will probably want to enter their CEOIs (call signs) in the Address List.

Setting up the Address List

> (1) Move the cursor over the ADRS LST button and depress the mouse TMI.
>
> (2) A new window, the ADDRESS LIST EDIT WINDOW, will appear, which contains an empty list of addresses, a text field, buttons for adding and deleting addresses, and a button to return to the SYS MAIN menu.
>
> (3) Move the cursor to the text field and enter the first address (CEOI or Group Name) to whom you wish to be able to send messages. This

address can be the individual CEOI of a vehicle or other battle entity, or may be the name of a group of such battle entities.

(4) Move the cursor to the ADD button and depress the mouse button.

(5) The address you entered appears in the list.

(6) Repeat steps 3 through 5 for each address you wish to add to the list.

(7) Click on Sys Main to exit the Address List Editor Window.

(8) To remove a name from the list, use the arrow buttons to move the highlight on to the name you wish to remove, and then click DELETE.

The Address List may be modified during an exercise by transferring to the SYS MAIN window and then to the Address List Edit window, and then following the above instructions.

7.2   The CEOI/Group List

Groups are collections of DMCC simulation entities. For example, several entities may be members of the same team, say TEAM A. If they wish to receive messages transmitted to TEAM A, they must tell their DMCCs to receive messages addressed to that group. Each DMCC allows its operator to be a member of up to seven groups.

Setting up the Group List

(1) Move the cursor over the CEOI/GROUP LIST button and depress the mouse button.

(2) A new window, the CEOI/GROUP LIST EDIT WINDOW, will appear, which contains a list of your CEOI and the groups of which you are a member, a text field, buttons for adding and deleting addresses, and a button to return to the SYS MAIN menu.

(3) Move the cursor to the text field, click on the test field, and enter the first group of which you wish to be a member.

(4) Move the cursor to the ADD button and depress the mouse cursor.

(5) The group you entered appear in the list.

(6) Repeat steps 3 through 5 for each group you wish to add to the list.

(7) Click on Sys Main to exit the ADDRESS LIST EDIT Window.

(8) You will now be able to receive messages addressed specifically to your CEOI, and also messages addressed to the groups you entered in the group list, provided that those messages are sent by a DMCC operating in the same exercise you are operating in.

(9) To remove a name from the list, use the arrow buttons to move the highlight on to the name you wish to remove, and then click DELETE.

7.3   The Location List

The Movement Command Report uses locations. These locations should be entered by the operator before the movement command message is transmitted. The location list is edited in the same manner as the address and group list.

Setting up the LOCATION List

(1) Move the cursor over the LOCATION LIST button and depress the mouse button.

(2) A new window, the LOCATION LIST EDIT WINDOW, will appear, which contains a list of locations which you can select from the MOVCMD report preparation window. This window also contains a text field, buttons for adding and deleting locations, and a button to return to the SYS MAIN menu.

(3) Move the cursor to the text field and enter the first location you wish to refer to when sending MOVCMD reports.

(4) Move the cursor to the ADD button and depress the mouse cursor.

(5) The location you entered appears in the list.

(6) Repeat steps 3 through 5 for each location you wish to add to the list.

(7) Click on Sys Main to exit the Location List Editor Window.

(8) You will now be able to reference the locations you entered from the MOVCMD report preparation window.

(9) To remove a name from the list, use the arrow buttons to move the highlight on to the name you wish to remove, and then click DELETE.

7.4   An Example of the Use of Address and Group Lists

The diagram in Figure XX shows, for illustration, an imaginary example of the configuration of Group and Address Lists for three simulation entities: two air vehicles and a Tactical Operations Center.

Entity 1 is an air vehicle which has A6B116 for it's CEOI/Call Sign, which appears in the first entry in the Group List. This entity is a member of a force element called TEAM A, so he has the Group Name TEAM A in his Group List, so he can receive messages addressed to TEAM A, as can everyone else who has TEAM A in his Group List. He is the wingman of Team A, so he has the Group Name WINGMANA in his list. This allows other DMCC entities to send messages to him with that address, as well. He has the group name BDE included so he can receive messages addressed to the whole brigade.

Entity 1 shows an address list with CEOI/Call signs of three team members, A6B117, A6B119, and A7A208. He can therefore SEND messages to those entities. Other entities in his address list include the TOC, the FSE, TEAM A (soe he can send messages to his whole team) and BDE (so he can send messages to the whole brigade).

Entity 2 is an air vehicle which has L4S112 for his CEOI/Call Sign, which appears in the first entry in his Group List. He is a member of Team L, so hea has the Group Name TEAM L in his Group List, and can receive messages addressed to TEAM L, as can everyone else who has TEAM L in his Group List. He is the wingman of TEAM L, and has the group name WINGMANL in his Group List, and therefor can receive messages addressed to WINGMANL. The list also has the BDE Group Name, so he can receive messages addressed to that group, too.

Entity 2's Address List contains the CEOI/Call Signs of two team members, L4S114 and L4S115, so he can send messages to those entities. Since his address list contains the Group Name TEAM L, he can send messages to those entites (who should only be members of his team) who claim membership in TEAM L by having that group name in their group lists. He can also address messages to the TOC and FSE.

Entity 3 is the tactical operations center. This TOC wants to receive messages addressed specifically to it, so the first name in its Group List is (as always is the case) TOC. The TOC wants to receive messages addressed to CINC, S3, and S2, so those names are included in the TOC's Group List. In order to observe the content of messages tranmitted to the various teams, the TOC has included TEAM A and TEAM L in the TOC's Group List as well.

Entity 3 (the TOC) wants to be able to transmit messages to all seven individual air vehicles in this exercise, so their CEOI's are included in the TOC's address list. The TOC wants to be able also to send messages to the FSE, so that name appears in the address list, too.

Remember:

The ADDRESS LIST is the list of individuals or groups to whom you want to SEND messages.

The GROUP LIST is the list which contains the CEOI and names of groups to which you wish to receive messages.

GROUP LIST	①	ADDRESS LIST	AIR VEHICLE #1 (PART OF TEAM A)
A6B116		A6B117	
TEAM A		A6B119	
WINGMANA		A7A208	
BDE		TOC	
		FSE	
		TEAM A	
		BDE	

GROUP LIST	②	ADDRESS LIST	AIR VEHICLE 2 (PART OF TEAM L)
L4S112		L4S114	
TEAM L		L4S115	
WINGMANL		TEAM L	
BDE		TOC	
		FSE	

GROUP LIST	③	ADDRESS LIST	TACTICAL OPERATIONS CENTER
TOC		A6B117	
CINC		A6B119	
S3		A7A208	
TEAM A		L4S112	
S2		A6B120	
TEAM L		L4S114	
		L42115	
		FSE	
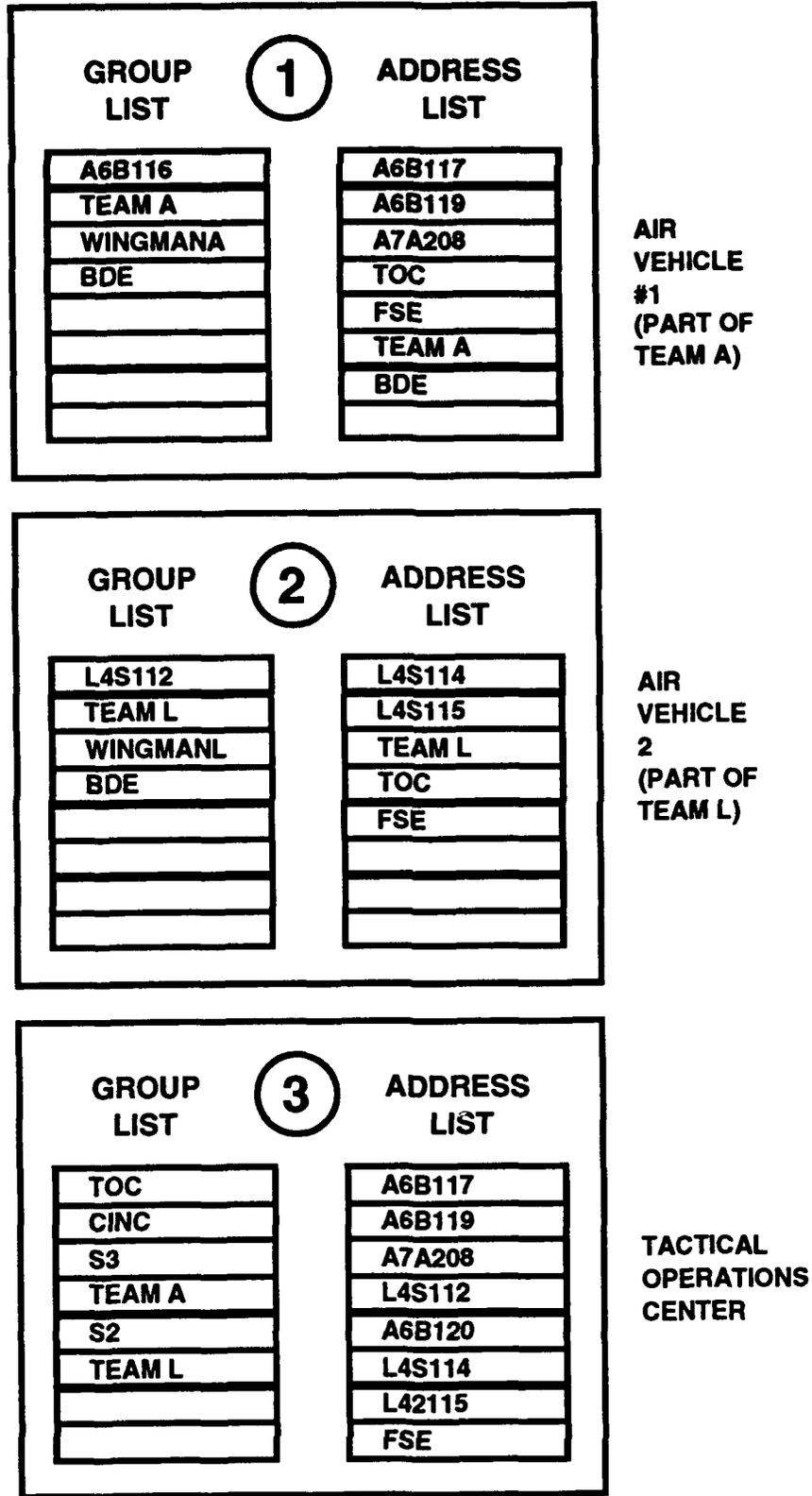
Figure 3   Address & Group List Example

You are now ready to send and receive messages.

8.   Operations: Sending Messages (Reports)

The Digital Message Communications Console is designed to be used at Tactical Operations Center stations, Fire Support Element stations, and to allow future growth into other simulation entity stations, including air and ground vehicle crew stations. The following table details the intended initial sources and destinations of the various message types in the initial AIRNET implementation.

It is important to note that this implementation of the AIRNET DMCC is intended for operation in a network simulation environment which contains other simulation enties which can send messages to and receive messages from DMCC entities. The following table depicts ONE CONFIGURATION of message senders and receivers; others are possible

Table 1   Preformatted Message Class Senders and Recipients

MSGS RECEIVED BY FSE DMCC	MSGS RECEIVED BY TOC DMCC	MSGS SENT FROM TOC DMCC	MSGS SENT FROM FSC DMCC
SPOT	SPOT		SPOT
BDA	*BDA*		
RECON	*RECON*		
ARTY:	ARTY:		
Repeat	*Repeat*		
Cancel	*Cancel*		
Check	*Check*		
CNO	*CNO*		
Shift	*Shift*		
New Msn.	*New Msn.*		
End Msn.	*End Msn.*		
			MTO
			Shot
			Splash
		REQUEST	REQUEST
STATUS	*STATUS*		
MOVCMD	MOVCMD	MOVCMD	MOVCMD
	NBC		
	PIREP		
	DNAV		
FREE TEXT	FREE TEXT	FREE TEXT	FREE TEXT
	MIJI		

In the above table, message types which are shown in italics may be received, queued, accessed and retrieved for display to the operator. In the context of the initial DMCC software delivery, those message types which are shown in regular type can be created and transmitted by the DMCC as well.

Digital Messages are sent in the form of REPORTS. Your DMCC is capable of sending several types of reports, and is capable of receiving those reports plus other reports which the DMCC is not capable of transmitting. These other message types are sent by digital message entities other than the DMCC.

Reports are prepared using a dedicated window for each report type. Depending on the type of message to be prepared and sent, each window contains switches for making selections and fields for entering text.

Note: It is not necessary to make each selection or fill in every text field in a report preparation window. Fields may be left blank, and selections may be not entered. In the case where a field is left blank or a selection is not made, no information will be transmitted with the message, and when the message is

retrieved and read by the recipient(s), the field will be blank or the text "Not Entered" will be displayed.

Preparing Reports

1. To send a report, first transfer to the SYS MAIN RPRTS window, which may be accomplished by selecting the RPTS button from the SYS MAIN window or the RPRTS button from the SYS MAIN MSG window. You will see a blank list, unless you received a message since you logged on. If messages have been received, they will appear with the PRIORITY messages listed above the ROUTINE ones, and with each the PRIORITY and ROUTINE ones arranged in order of their receipt, with the more recent ones towards the top of the list.

2. Now transfer to the REPORTS window by clicking RPRTS. You will see another window which has button buttons to click for each of the different reports types. Note: you may also transfer directly from the SYS MAIN window to the REPORTS window.

3. You will now select which type of report to prepare and send.

8.1   SPOT REPORT

1. To send a SPOT report, click on the SPOT button. The window for preparing SPOT reports will appear.

The SPOT report screen contains five enumerated selection fields: ADRS, ENEMY TYPE, ENEMY ACTIVITY, DIREC, and OBS INT . These selection fields operate by clicking the button next to each.

Initially, none of the selections are highlighted, except for the first address in the address selection field. When you click on the button next to one of the selection fields, the first selection becomes highlighted. Each additional time you click on that button, the highlight moves to the right one selection, When the last selection is highlighted and you click the button again, the highlight goes back to the first selection.

The ADRS and ENEMY ACTIVITY selection fields contain more choices than can all be displayed at the same time, so the MORE button allows you to access another set of selections. Clicking the MORE button again brings back the first set of selections.

The ADRS selection field contains the addresses you entered in the ADDRESS LIST EDIT window.

The ENEMY TYPE selection field contains selections for different types of enemy as shown in the table below:

Table 2   Spot Report Enemy Types

ENEMY TYPE	MEANING
ADA	Air Defense Artillery Battery
SAM	Surface to Air Missile Battery
TANK	Tanks
WHLD	Wheeled Vehicle
TRKD	Tracked Vehicle
ACFT	Aircraft
TRPS	Troops
UNCL	Unclear

The ENEMY ACTIVITY selection field contains selections for different types of enemy activities as shown in the table below:

Table 3   Spot Report Enemy Activity

ENEMY ACTIVITY	MEANING
NONE	No Activity
STATION	Stationary
MVNG	MOVING
DUG-IN	Dug In
RETREATING	Retreating
ADVANCING	Advancing
ATTACKING	Attacking
DAMAGED	Damaged
KILLED	Killed
MOBIL KILL	Mobile Kill

The Direction selection field contains selections for the eight cardinal points of the compass, North, North-East, East, South-East, South, South-West, West, and North-West. This indicates the direction of travel of the enemy force.

The OBS INT (Observer Intent) selection field contains selections for different types of intended activity on the part of the person who is making the report.

Table 4   Spot Report Enemy Types

OBS INT	MEANING
CONT MSN	Continue Mission
ENGA	Engage the Enemy
RTS IHLD	
OBSV TGT	Observe Target

The SPOT REPORT window contains three small text fields for entering enemy SPEED, NUMBER and UNIT. These text fields are used by moving the cursor with the mouse to the field, until the cursor shape changes to a text insertion cursor, which appears as an "I-beam" shape. Cicking on the text field then causes a small vertical "caret" text cursor to appear, marking the point of insertion.

There is a TMI button for switching back and forth between Miles Per Hour and Kilometers Per Hour for the SPEED field. If you enter a speed in MPH and then click the MPH/KPH button, the value will not be converted to KPH and vice versa.

The TOP CIK TEXT FIELD is for entry of free text information of up to 23 characters. This free text annotation can be used to provide any additional information which is desired to be included with the message, up to a limit of 23 characters. This free text annotation is optional for all report message types, and need not be filled in order to transmit a message.

The BOTTOM CIK TEXT FIELD is for entry of the location of the enemy force element in Universal Transverse Mercator coordinates.

8.1.1 Universal Transverse Mercator (UTM) Coordinates

Universal Transverse Mercator coordinates consist of two letters followed by an even number of numerals. The two letter designator describes which sector in the UTM map system is being referred to, and the numbers describe where in the sector the point of interest is located. The number field is partitioned into two parts, with the first half, called the "easting", describing the east-west location of the point of interest with respect to the southwest corner of the sector, and the second half, called the "northing," describing the north-south location of the point of interest with respect to the southwest corner of the sector. Thus, an example of a UTM coordinate would be

NB44445555

where the sector is NB, the easting is 4444, and the northing is 5555.

The actual number of digits in the easting and northing fields may vary, depending on the desired resolution of the location information. The more digits used, the more precise the position information.

The DMCC can handle UTM coordinates with up to seven digits for both easting and northing, allowing sub-meter location precision. This resolution is impractical for manual entry, and is provided to allow the DMCC to be compatible with automatic targeting systems of high resolution.

It is not necessary to enter seven digits for easting or northing. You could enter

NB2244

with 2 digits of easting and northing, for example, or

NB22004400, with 4 digits of easting and northing, or

NB22000004400000

with seven digits of easting and northing. These entries are equivalent.

The DMCC software automatically determines the resolution of the entry, and packages the numerals in the message accordingly. To do this, it counts the number of numerals entered, and uses the first half of them for easting and the second half for northing. In order for the DMCC software to parse the UTM data, it is required that the number of easting and northing digits taken together is EVEN. The DMCC will ignore UTM information which has an odd number of easting and northing digits, since it cannot parse an odd number of digits in half. In this case, no UTM information will be transmitted. No warning of this condition is given by the DMCC software to the user, so care must be taken to ensure UTM information is entered properly.

8.1.2 Priority

The DMCC is capable of sending messages of a routine and urgent nature. Each message can only be routine or urgent. The urgent messages are marked with the letter U by the receiving DMCC and are listed at the top of the list of messages. Routine messages are marked by the receiving DMCC with the letter R and are listed below the urgent messages.

The SPOT REPORT window contains two TMI buttons for transmission of messages: SEND URGENT and SEND ROUTINE. Clicking on one of these buttons transmits the message.

The SAVE & RETURN key saves the message being prepared and returns to the REPORTS screen. If the SPOT REPORT window is activated again, its contents

will be the same as they were before SAVE & RETURN was chosen. In this way, a person can be in the middle of preparing a report, leave the report (to, say, for example, access another type of report which has just arrived) and then continue preparing the first report where he left off.

The CLEAR & RETURN key returns control to the REPORTS screen and also deletes or clears any message which was being prepared when the CLEAR & RETURN key was selected. Any message deleted accidentally in this manner is unrecoverable.

8.2   FREE TEXT Report

The DMCC has the capability of transmitting a FREE TEXT REPORT which is a character string of up to 255 alphanumeric characters. The FREE TEXT REPORT is used for sending orders, advisories or other messages which do not fall neatly into any of the other message categories.

It is important to distinguish between the FREE TEXT ANNOTATION which is sent with every message type, and the actual FREE TEXT REPORT which contains much more text, and is used to send more detailed information.

The free text report screen contains the ADRS selection field and button button, an area for entry of the textual data, and the two 23 character CIK text fields. Only the top CIK text field is used for free text annotation.

The area for entry of text can accommodate up to 255 characters. Automatic word-wrapping is used, so that the user does not need to worry about inserting carriage return characters. The insertion point may be moved around the field of text by clicking the mouse cursor at the text insertion point. The mouse cursor must be within the free text area in order to enter text.

The top 23 character CIK text field is provided here in the FREE TEXT MESSAGE report to maintain consistency with other report types. Some mission management models call for use of these secondary textual data as keys to information in the message itself. It might be considered a message title, a message descriptor, or simply a place to put different kinds of short textual data.

The SAVE & RETURN key saves the message being prepared and returns control to the REPORTS screen. If the FREE TEXT REPORT window is activated again, its contents will be the same as they were before SAVE & RETURN was chosen. In this way, a person can be in the middle of preparing a report, leave the report (to, say, for example, access another type of report which has just arrived) and then continue preparing the first report where he left off.

The CLEAR & RETURN key returns control to the REPORTS screen and also deletes or clears any message which was being prepared when the CLEAR & RETURN key was selected. Any message deleted accidentally in this manner is unrecoverable.

8.3   MOVEMENT COMMAND (MOVCMD) Report

The Movement Command report is used to direct units to a particular location to perform a particular activity, or to inform others of one's intent to move somewhere. It is intended to replace the traditional verbal or written FRAGO (Fragmentary Order) which has been used to convey timely changes to missions which were previously outlined in Operational Orders (OPORDs).

The MOVCMD REPORT preparation window is accessed from the REPORTS window. The MOVCMD REPORT contain selection fields for ADRS (address), TASK, WHEN (Time), and LCTN (Location).

The TASK selection field contains the following selections:

Table 5   MOVCMD Task Types

TASK	MEANING
MOV TO	Move to Specified location
HOLD AT	Hold at Specified location
CONT MSN	Continue mission
RENDEZ AT	Rendezvous at Specified location.
ENGAGE TGT AT	Engage the target at Specified location
MVNG TO	Moving to Specified location
HLDG AT	Holding At Specified Location
ARRVG AT	Arriving At Specified location
PASSG THRU	Passing Through this Location
DEPRTG FROM	Departing From Specified Location

The WHEN selection field contains the following selections:

Table 6   MOVCMD When Types

WHEN	MEANING
IMMED	Immediately
WHN RDY	When Ready
A M C	At My Command
DTG	Date Time Group...

The Date Time Group allows you to enter the time in the lower CIK field. The time is entered in the following format, where HH is the hours and MM is the minutes, using 24 hour military time:

Table 7   Date Time Group Types

HH:MM L	for entry in Local time or
HH:MM Z	for entry in Zulu time.

The LOCN (Location) selection field contains MY POSN (My Position) and other location designators which are entered in the LOCATION LIST EDIT Window. The Location Selection Field allows you to select the location designator from the list of locations.

The MOVCMD report preparation window also contains a 23-character free text annotation field which may optionally be used to enter up to 23 characters of free text for transmission with the message.

The SAVE & RETURN key saves the message being prepared and returns control to the REPORTS screen. If the MOVCMD REPORT window is activated again, its contents will be the same as they were before SAVE & RETURN was chosen. In this way, a person can be in the middle of preparing a report, leave the report (for example, to access another type of report which has just arrived) and then continue preparing the first report where he left off.

The CLEAR & RETURN key returns control to the REPORTS screen and deletes or clears any message which was being prepared when the CLEAR & RETURN key was selected. Any message deleted accidentally in this manner is unrecoverable.

8.4   MESSAGE TO OBSERVER (MTO) Report

The MESSAGE TO OBSERVER (MTO) REPORT may be one of three types: Request Adjust, Enter as Target, and End Mission. The MTO window has three TMI buttons for selecting which of the three types of Message To Observer to

send. Once one of these has been selected, the SEND ROUTINE and SEND URGENT TMI text will change to reflect the message type selected. When, after optionally entering a free-text annotation, the operator clicks SEND EAT ROUTINE, a Enter As Target? message is transmitted with ROUTINE priority.

The MTO report window contains a selection field for the addressee which operates in the same manner as the address selection field in the other reports.

The SAVE & RETURN key saves the message being prepared and returns control to the REPORTS screen. If the MTO REPORT window is activated again, its contents will be the same as they were before SAVE & RETURN was chosen. In this way, a person can be in the middle of preparing a report, leave the report (to, say, for example, access another type of report which has just arrived) and then continue preparing the first report where he left off.

The CLEAR & RETURN key returns control to the REPORTS screen and also deletes or clears any message which was being prepared when the CLEAR & RETURN key was selected. Any message deleted accidentally in this manner is unrecoverable.

8.5   REQUEST Report

The REQUEST REPORT is not really a report as such, but rather is a message asking for a report. This window contains the usual CIK features and a selection field to select the type of report to be requested from the recipient, NONE, STATUS, SPOT, RECON, MVMNT, PIREP, MIJI. If the operator selects the RECON option, he may choose the kind of RECON report he is requesting by use of the third selection field.

The REQUEST Report window contains an address selection field, the 23 character appended free text field, and buttons for transmitting the message as urgent or routine. The appended free text field may be used to enter any information deemed by the operator to be of value to the entity receiving the REQUEST, or may be used to indicate in further detail exactly what information is required by the sender.

The SAVE & RETURN key saves the message being prepared and returns control to the REPORTS screen. If the REQUEST REPORT window is activated again, its contents will be the same as they were before SAVE & RETURN was chosen. In this way, a person can be in the middle of preparing a report, leave the report (to, say, for example, access another type of report which has just arrived) and then continue preparing the first report where he left off.

The CLEAR & RETURN key returns control to the REPORTS screen and also deletes or clears any message which was being prepared when the CLEAR &

RETURN key was selected. Any message deleted accidentally in this manner is
unrecoverable.

8.6   SHOT Report

The SHOT REPORT is used by fire support elements to advise another simulation entity that a shot has been fired from artillery or indirect fire weapons. It is used to alert the entity, usually an observer directing indirect fires, that a shot has been fired.

The SHOT REPORT window contains an address selection field, the 23 character appended free text field, and buttons for transmitting the message as urgent or routine. The appended free text field may be used to enter the number of rounds, the type of round, or any other information deemed by the operator to be of value to the entity receiving the SHOT report.

8.7   SPLASH Report

The SPLASH report is used by fire support elements to alert other simulation entities as to the imminence of rounds hitting the ground. It is usually transmitted five seconds before the anticipated impact of the round with the terrain. It is used to provide warning to observers of incoming nearby indirect fires.

The SPLASH report contains an address selection field, the 23 character appended free text field, and buttons for transmitting the SPLASH message as urgent or routine. The appended free text field may be used to enter the number of rounds, the type of rounds, the number of seconds until anticipated impact of the rounds, if different from the default 5 second-to-impact interval, or any other information deemed by the operator to be of value to the entity receiving the SPLASH report.

9.   Operations: Receiving Messages

When operational , the Digital Message Communications Console software continuously monitors the SIMNET ethernet network for incoming digital messages. A portion of the software called the Digital Message Server is alerted by the ethernet software when a message is received. The Digital Message Server examines the message to determine if it is addressed individually to any of the active DMCC client entities or to a group of which any of the active DMCC client entities is a member. If the message is not addressed to any of the individual, active DMCC client entities or to a group of which any of the client entities is a member, then the Digital Message Server software discards the message. If the message is addressed to one of the individual active DMCC client entities, or to a group of which one or more of the client entities is a member, then the message is stored in memory and the individual client software entities to which it is

addressed are informed of the message arrival and its location in the shared memory. The client entities then automatically retrieve the message from shared memory and place it in their respective message queues. The client entities then display a pop-up alert box or window to alert the operator of the client station that a message has been received and is available in the message queue for access and display.

The above process takes place without any intervention by the operator. No operator action is necessary for a message to be received by the ethernet software, passed to the digital message server, and queued by the client entities to which it is addressed.

10.   Operations: Accessing Received Messages

When a message is received by a DMCC client entity, a pop-up alert window will appear announcing the arrival of the message. This window is dismissed from the screen of the terminal by clicking the mouse pointer on the DISMISS button in the alert window. It may also be dismissed by depressing the RETURN key while the mouse cursor is within the alert window boundary.

After this pop-up alert window is dismissed, the DMCC software will store the message in its message queue.

The DMCC client message queue will accumulate up to 15 messages. The number of unread messages is shown on the envelope idon at the bottom of the SYS MAIN MSGS window.

The list of messages is displayed in the SYS MAIN MSG window. To activate this window from the SYS MAIN window, click on the MSGS button. To activate this window from the REPORTS window, click on the MSGS TMI.

. The SYS MAIN MSGS window (sometimes called simply the MSGS window or the queue window) displays a list of the messages in the client message queue, listing them with their sender, message type, time of transmission, and priority.

The message queue displays the list of messages with the URGENT ones at the top of the list, followed by ROUTINE messages.

The URGENT messages, if any, are arranged in the order received, with the most recent messages listed at the top.

The ROUTINE messages, if any, are arranged with the most recent ROUTINE message just after the oldest URGENT message, and with the rest of the

ROUTINE messages arranged in the order received, with the most recent messages listed at the topmost position of the ROUTINE messages.

11. Operations: Retrieving a Message

11.1 READ

To retrieve a message for display, click on the message title with the mouse cursor. This message will then be highlighted by the graphical user interface in the MSGS window and is said to be SELECTED. To read the message, click the mouse cursor in the READ TMI. When this occurs, the window will change to show the message.

When a message is accessed for reading in the above manner, the DMCC software automatically sends and ACKNOWLEDGE message to the sender DMCC entity. The originating terminal will display a pop-up alert window to indicate that the message was accessed and retrieved for display by the receiving person.

Note that the acknowledgment message is not sent when the message is received, but when it is actually selected and displayed.

To exit the READ window, click on the READ button again and control will return to the SYS MAIN MSGS window's list of received messages.

11.2 RE-USE; RE-USE & INCLUDE

While in the SYS MAIN MSGS or READ window, you may elect to re-transmit a message to another simulation entity. This forwarding feature is activated by clicking on the RE-USE TMI or the RE-USE & INCLUDE TMI. If you click on RE-USE, the DMCC software will bring up a window which contains the address selection region. To re-transmit a message, select the addressee CEOI or group name from the address selector and then click SEND ROUTINE or SEND URGENT. The message will be forwarded to the new recipient.

If you desire to enter a new message to be appended to the original message for transmission to the new recipient, click RE-USE & INCLUDE from the SYS MAIN MSGS or READ window. This will transfer control to the REPORTS window where you may select the type of message you wish to prepare for inclusion with the forwarded (or RE-USE-ed) report message. After choosing which type of report to include, and preparing the new message in the normal manner, both it and the old message will be transmitted to the new addressee.

11.3 REPLY

While in the SYS MAIN MSGS window or the READ window, you may elect to reply directly to the sender. To do this, you click on the REPLY TMI, which passes control into the REPORTS window where you can select the type of message for reply. When you enter the message preparation window for that type of message, the address field will already contain the name of the sender, and will be highlighted. This way, you do not need to explicitly enter the address of the reply message.

12. Operations: Logging Off

To terminate operation of the DMCC software for a particular client entity, proceed to the SYS MAIN window and click the LOGOFF button with the mouse cursor. The client process will inform the message router that it is going to shut down. Then, the client process halts operation. Other client processes may still be active in the workstation, however. To effect a complete shutdown of the DMCC software, each client entity must terminate its activity.

13.   Appendix A: DMCC Startup/Shutdown Procedures

Please refer to the DMCC Cold Start Procedures, ADST .... for information on loading and confuguring the DMCC software.

The following describes how to configure the operational environment of the workstation to run the DMCC software and how to turn on the DMCC software manually. This procedure is normally carried out by simulation laboratory support personnel. This procedure will be supplanted by a more automated method which will be described here when it becomes available.

There are 3 software programs that must be started before the X-window operator interface program can be started. These 3 programs receive, transmit and disperse DMCC messages from the ethernet interface to any operator running the interface program. Once started they will not need any further intervention and can be left running even after all operators have logged out.

1. Log-in to host computer using a root account.
   - Start the appropriate window desktop, if it does not start automatically.

2. Cleanup any previously running programs
   - Enter the command 'ps augxw' and determine if the following programs are already running:

    dms
    dmcc_sim_rx
    dmcc_sim_tx
    dmcc
   (there might be many copies of the **dmcc** program)
   If they are running, then stop them using the 'kill -9 pid' command, where pid is the process id from the output of the ps command.

3. Start message server and network interface programs
   - Change directory to the dmcc directory (as of 1/18/93 this is /dmcc/dmcc)
   - To start the dmcc programs as stand-alone enter the following commands in any window

    dms >/dev/null &
    dmcc_sim_rx le0 >/dev/null &
    dmcc_sim_tx le0 >/dev/null &

   - le0 above is the device name of the ethernet interface running simnet on a Sparc2.
   - You can also start the programs in separate windows to view the debug output, or you can pipe the output to a file.

4. Start operator interface program
- Change directory to gui directory (as of 1/18/93 this is
    dmcc/dmcc/gui).
- The dms program must be running before starting the dmcc program.
- Enter the following command in any window:
    dmcc >/dev/null &
- Up to 8 copies of the dmcc operator interface program can be run
    simultaneously one one host
- Login using the operator login procedure

5. Shutdown programs
- Logging out of the dmcc program will shut it down.
- There is no need to stop the other 3 programs, and there is no automated
    way of stopping them. To stop, them get their pid's from the ps
    command, and then enter
    kill -9 pid

14. Appendix B: DMCC Software Architecture

The DMCC operational hardware environment is a Sun Microsystems SPARCstation Model 10 workstation, configured in an isolated ethernet with one or more Wyse X-terminals. In addition, the workstation is connected via a second ethernet interface to the SIMNET simulation network. The DMCC uses a custom protocol of single-data unit digital messages.

DMCC software is divided into two parts, the ethernet interface and message server software on the one hand, and the X-Windows client application software on the other. Only one copy of the ethernet/digital message server software is active at any one time for normal operation. Up to eight client applications may be running at the same time, one for each Digital Message Communications Console entity existing in an exercise.

The DMCC software runs in the Sun workstation, and the X-terminals allow more than one user to run separate simultaneous instances of the DMCC Client software.

The following diagram illustrates the software and hardware architecture of the DMCC system.
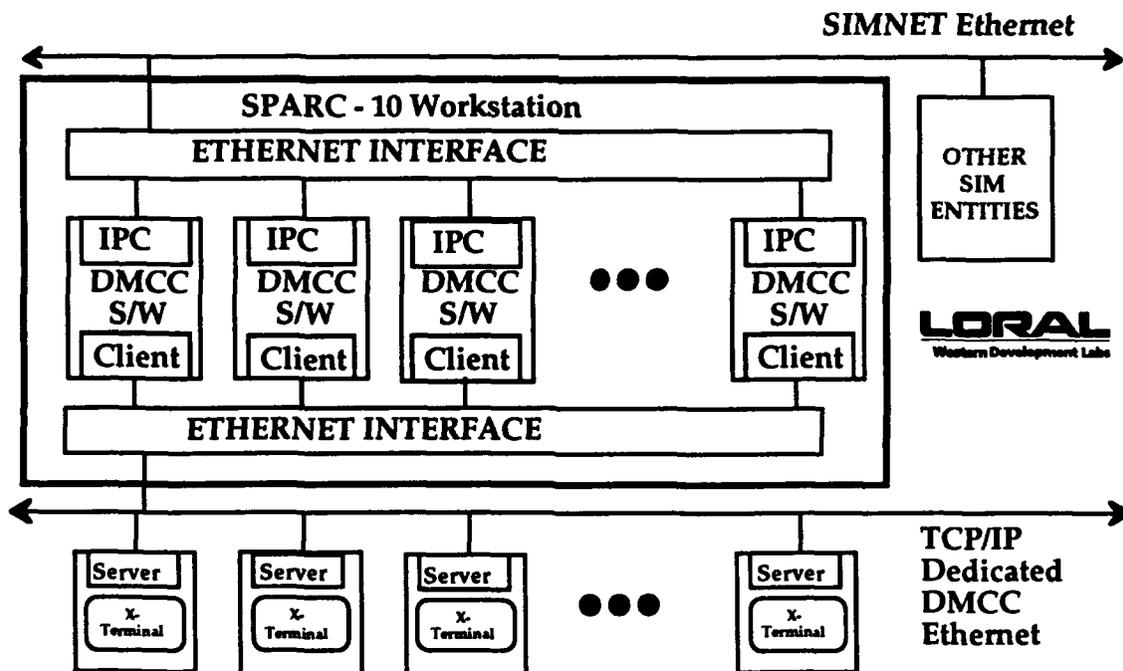
Figure 4   Software and Hardware Architecture

15. Appendix C: Acronyms

APDU:	Association Layer Protocol Data Unit
ARTY:	Artillery
BDA:	Battle Damage Assessment
BX	Builder's Xcessory
CEOI:	Communications Electronic Operational Identifier (Call Sign)
CIK:	Cockpit Interactive Keyboard
CNO:	Can Not Observe
DMC:	Digital Message Communications
DMCC:	Digital Message Communications Console
DMCS:	Digital Message Communications System
ENET:	Ethernet
GUI:	Graphical User Interface
MOVCMD:	Movement Command
MTO:	Message To Observer
OSF	Open Software Foundation
PDU:	Protocol Data Unit
PIREP:	Pilot Report
SIMNET:	Simulation Network
SMD:	Situation Management Display
Sys Main:	System Main
TMI:	Tactile Message Indicator
X	X-Windows Windowing System

16. Appendix D: DMCC Window Diagrams

Included in the folder in which this document exists are several Microsoft Word documents which contain "screen shots" of the DMCC windows. These files contain Embedded PostScript commands formatted as hidden text PostScript. They are not viewable as images in the Word application, but will print on a printer such as the LaserWriter, provided that the **PRINT HIDDEN TEXT** function is DISABLED.

The window diagrams constitute Figures 3A through 3P.

The following pages contain page headers and footers along with legends for these drawings.
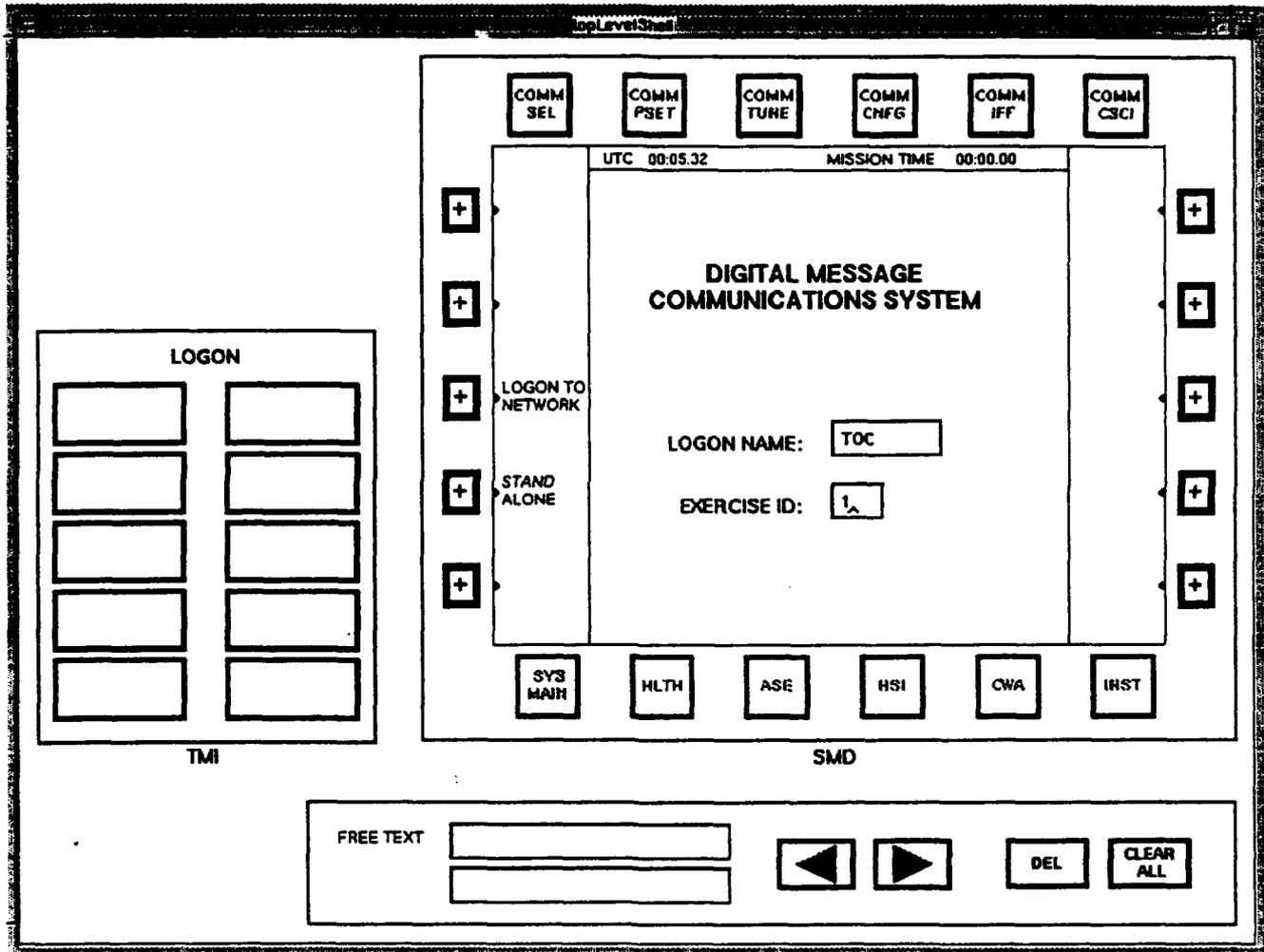
Figure 5 LOGON WINDOW
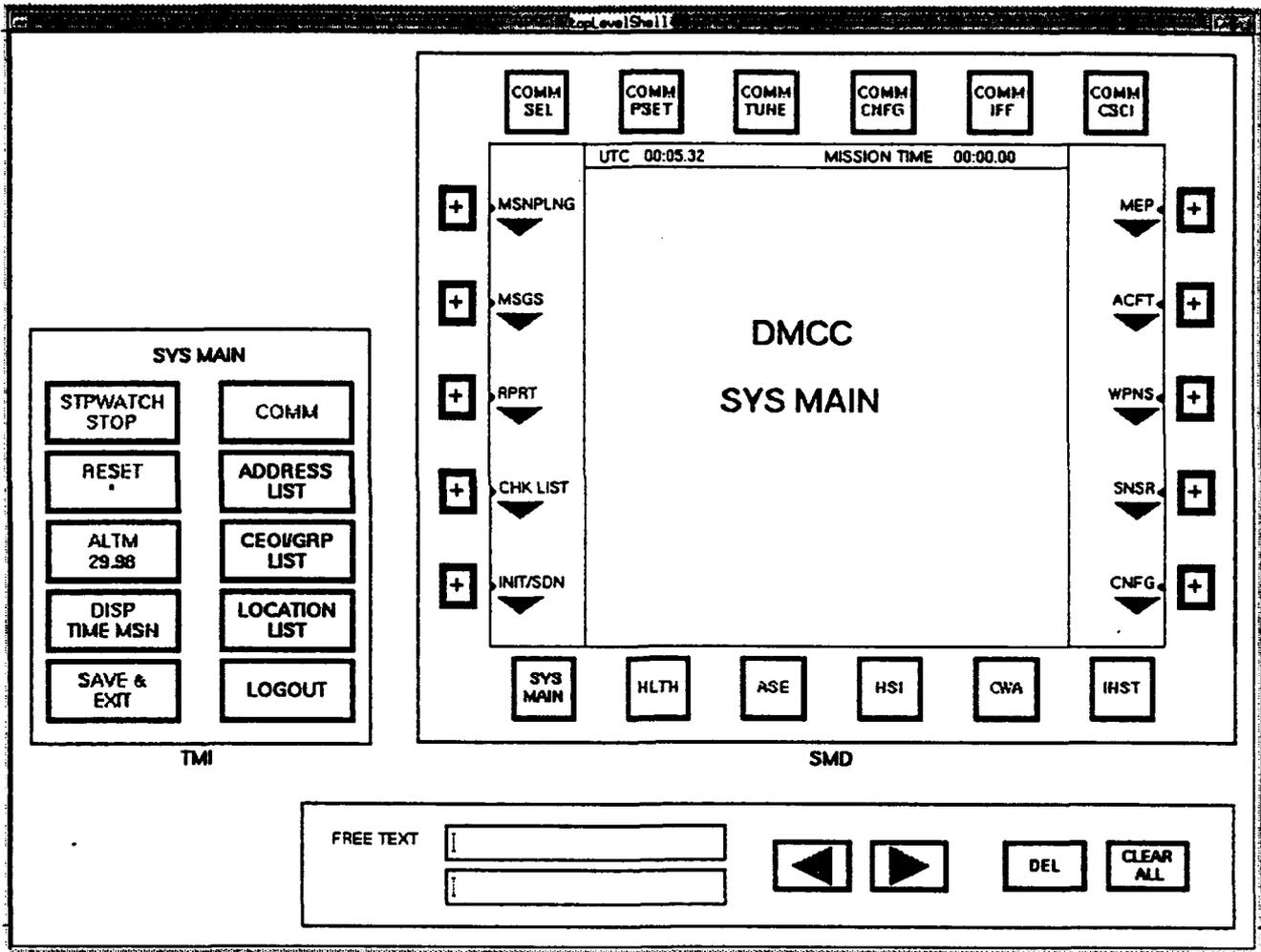
Figure 6   SYS MAIN WINDOW
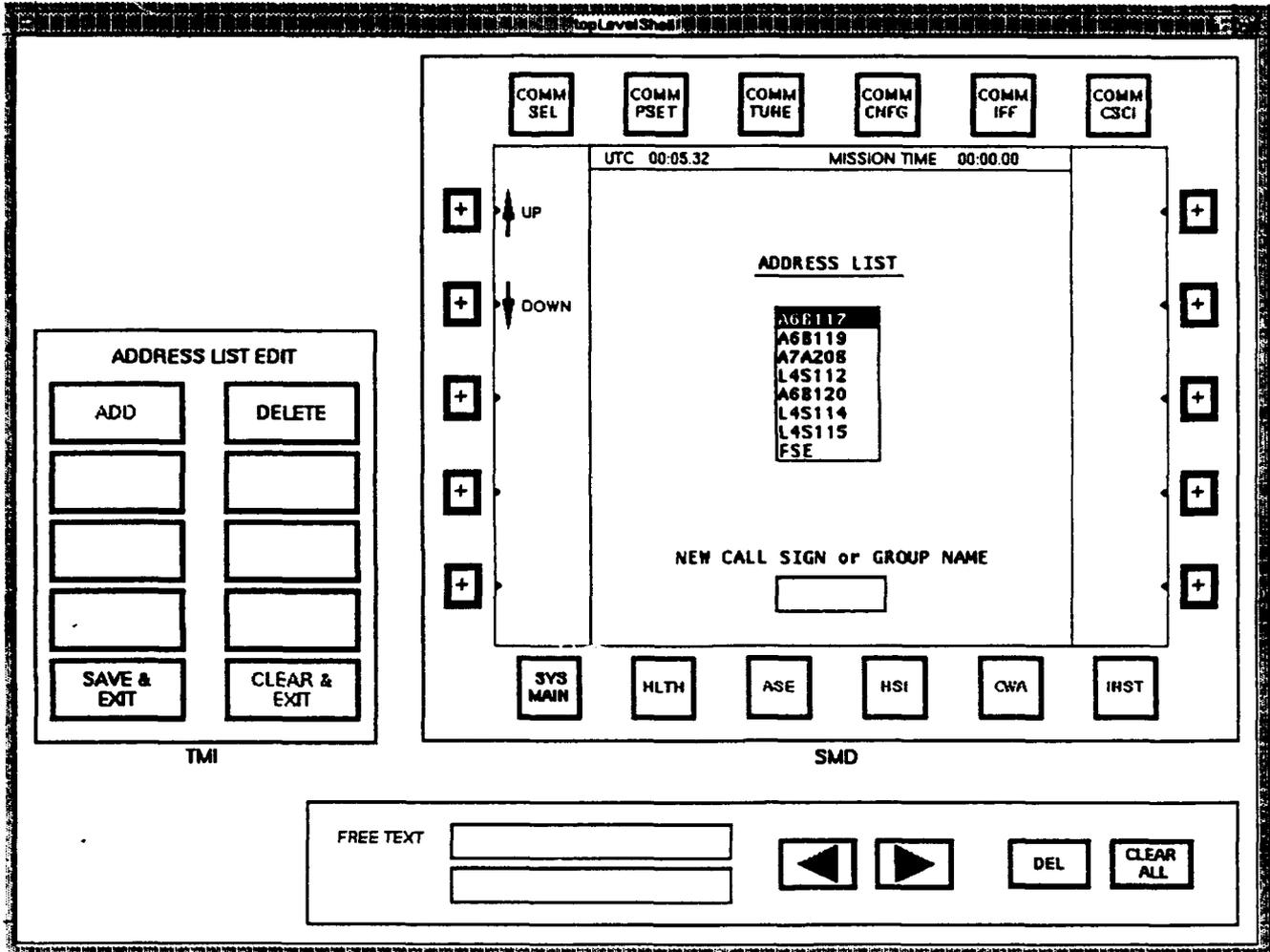
Figure 7   ADDRESS LIST EDIT WINDOW
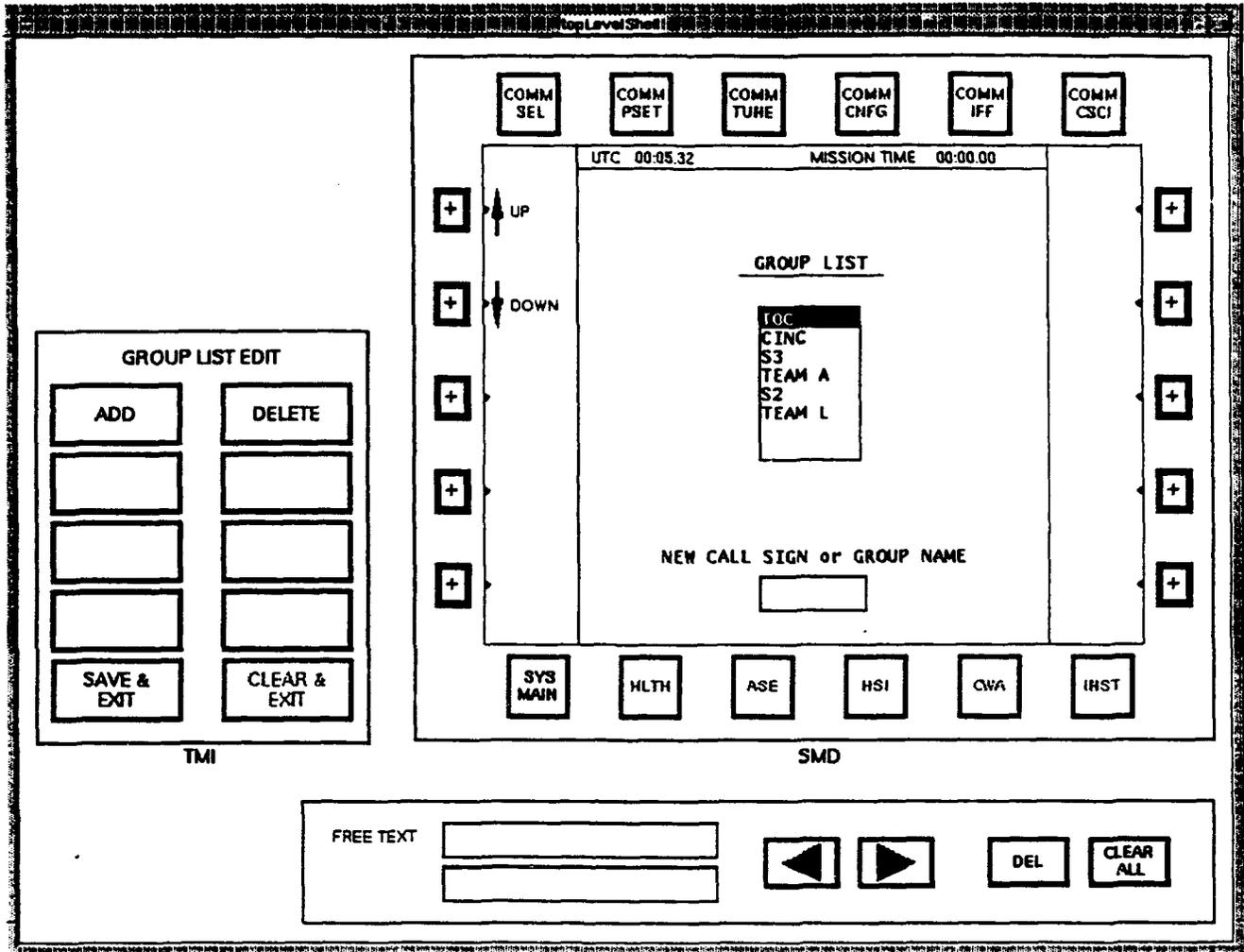
Figure 8   GROUP LIST EDIT WINDOW
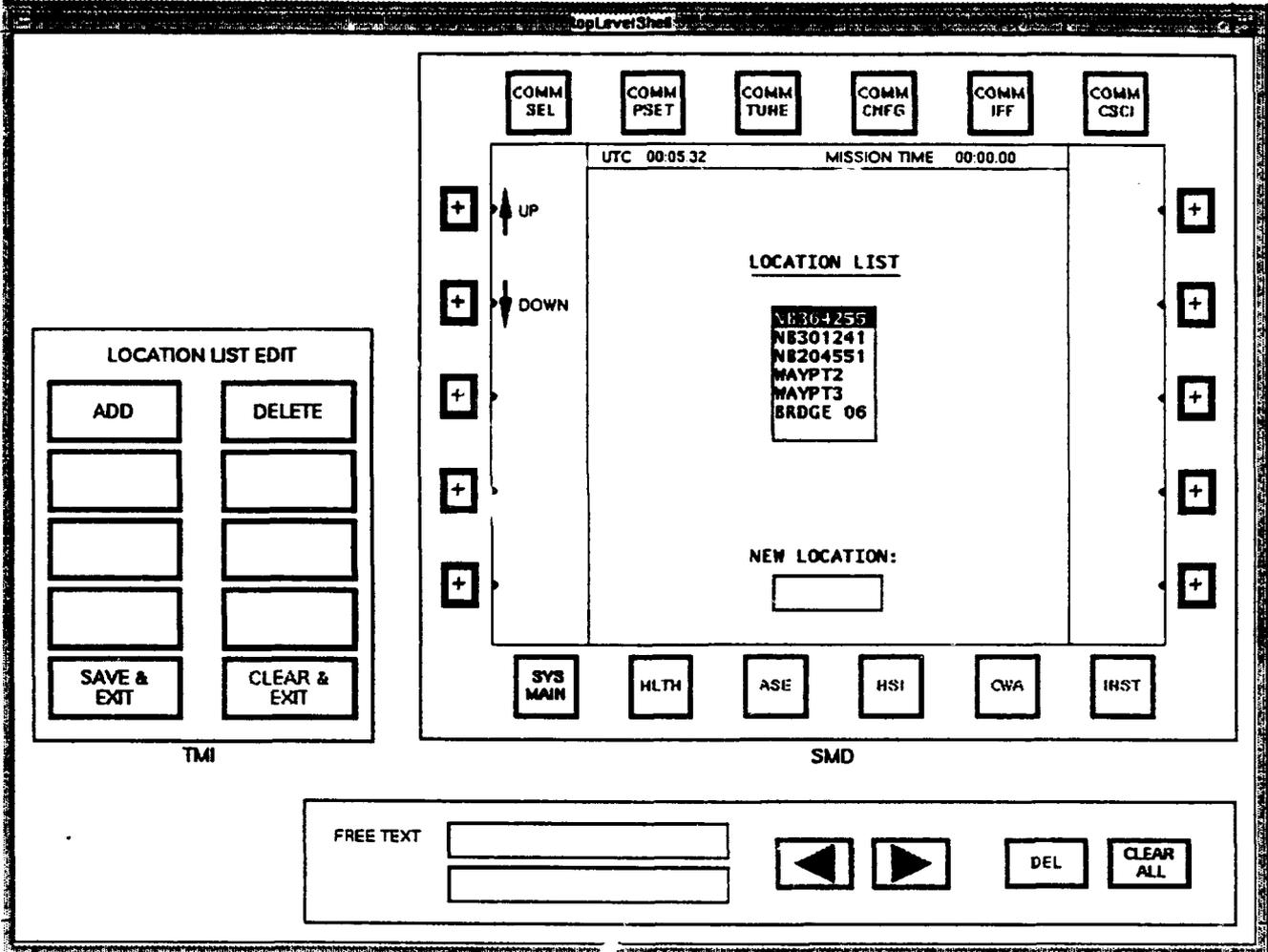
Figure 9 LOCATION LIST EDIT WINDOW
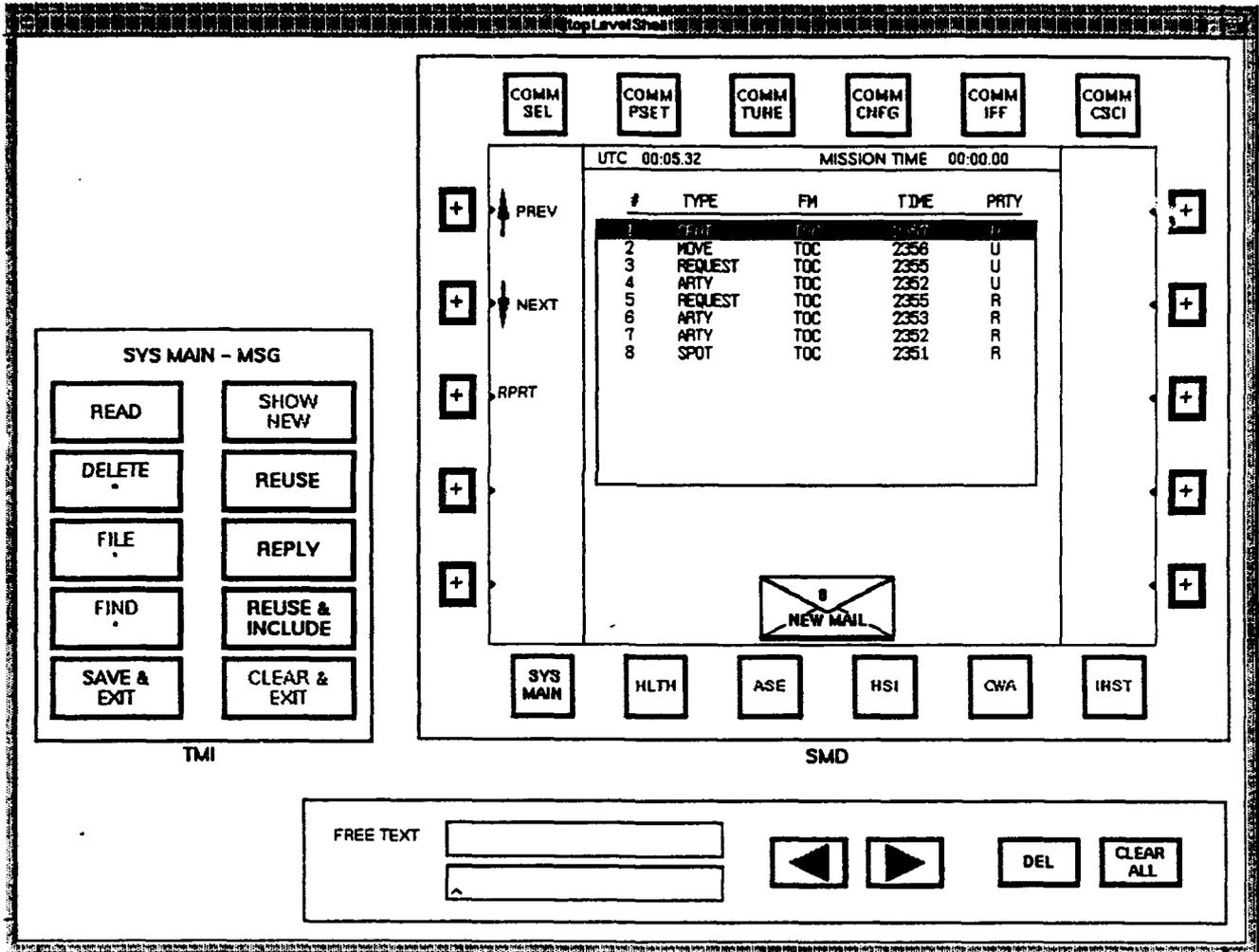
Figure 10 SYS MAIN MSG WINDOW
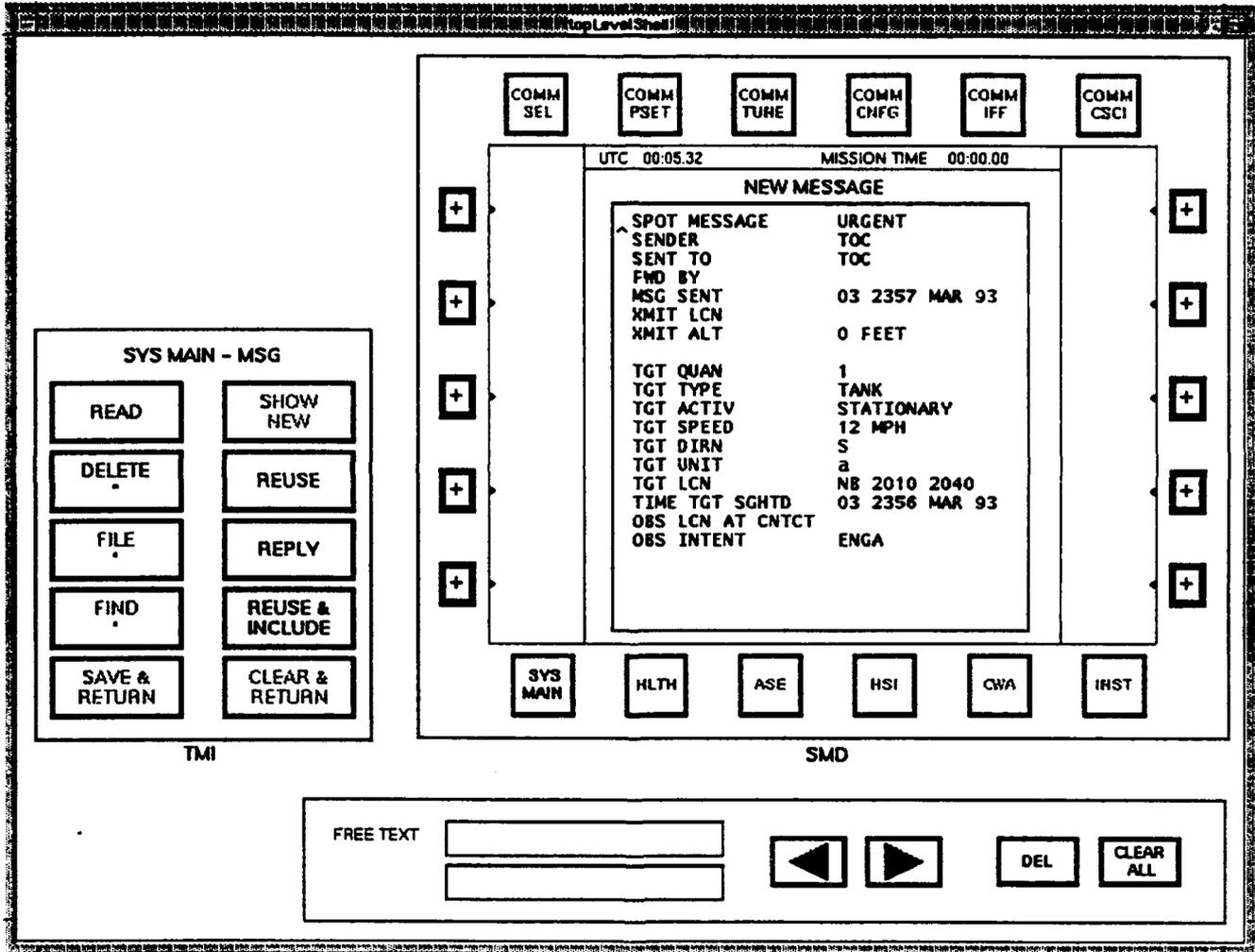
Figure 11 SYS MAIN MSG READ WINDOW
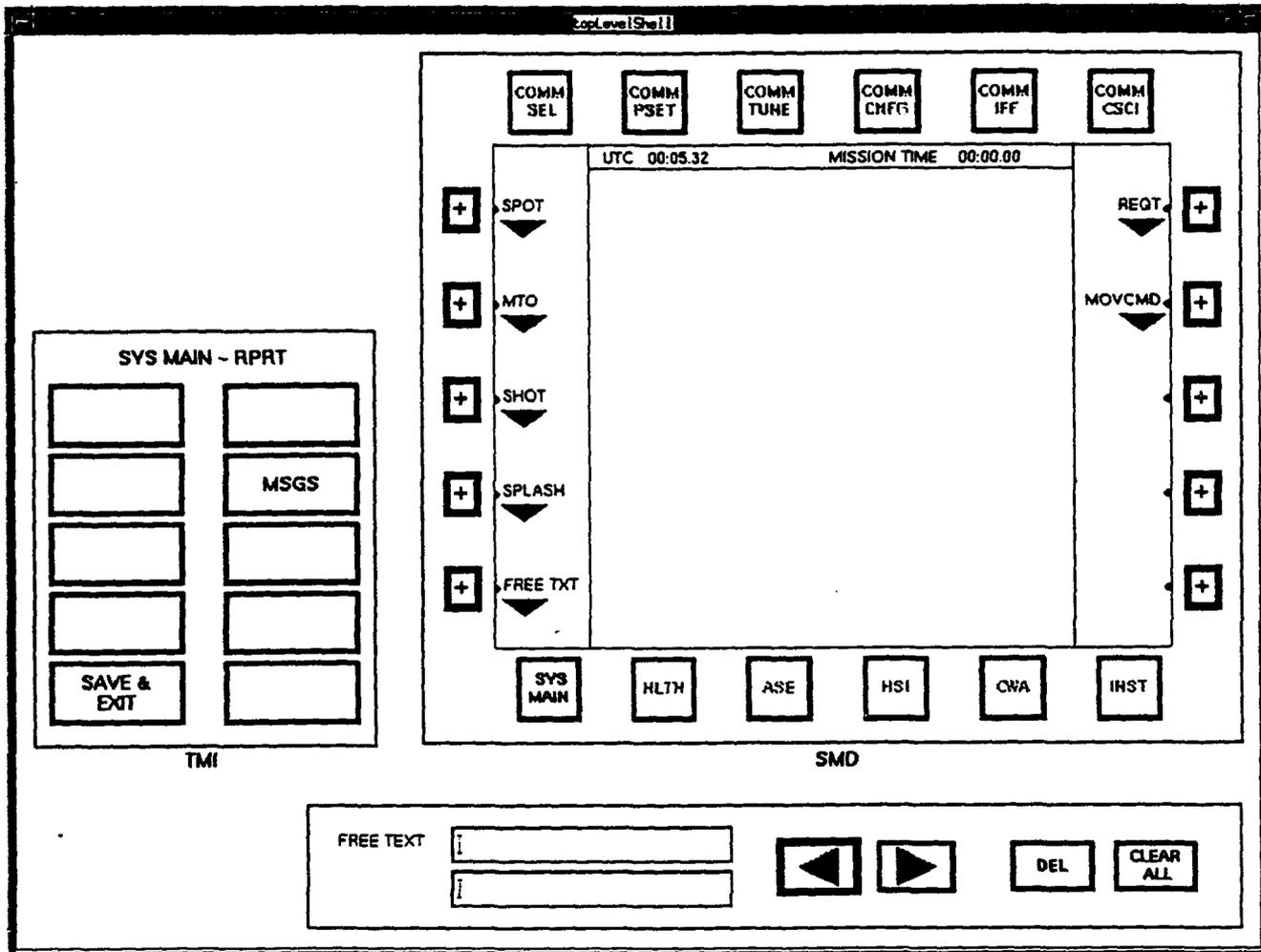
Figure 12 REPORTS WINDOW

Figure 13 SPOT REPORT WINDOW
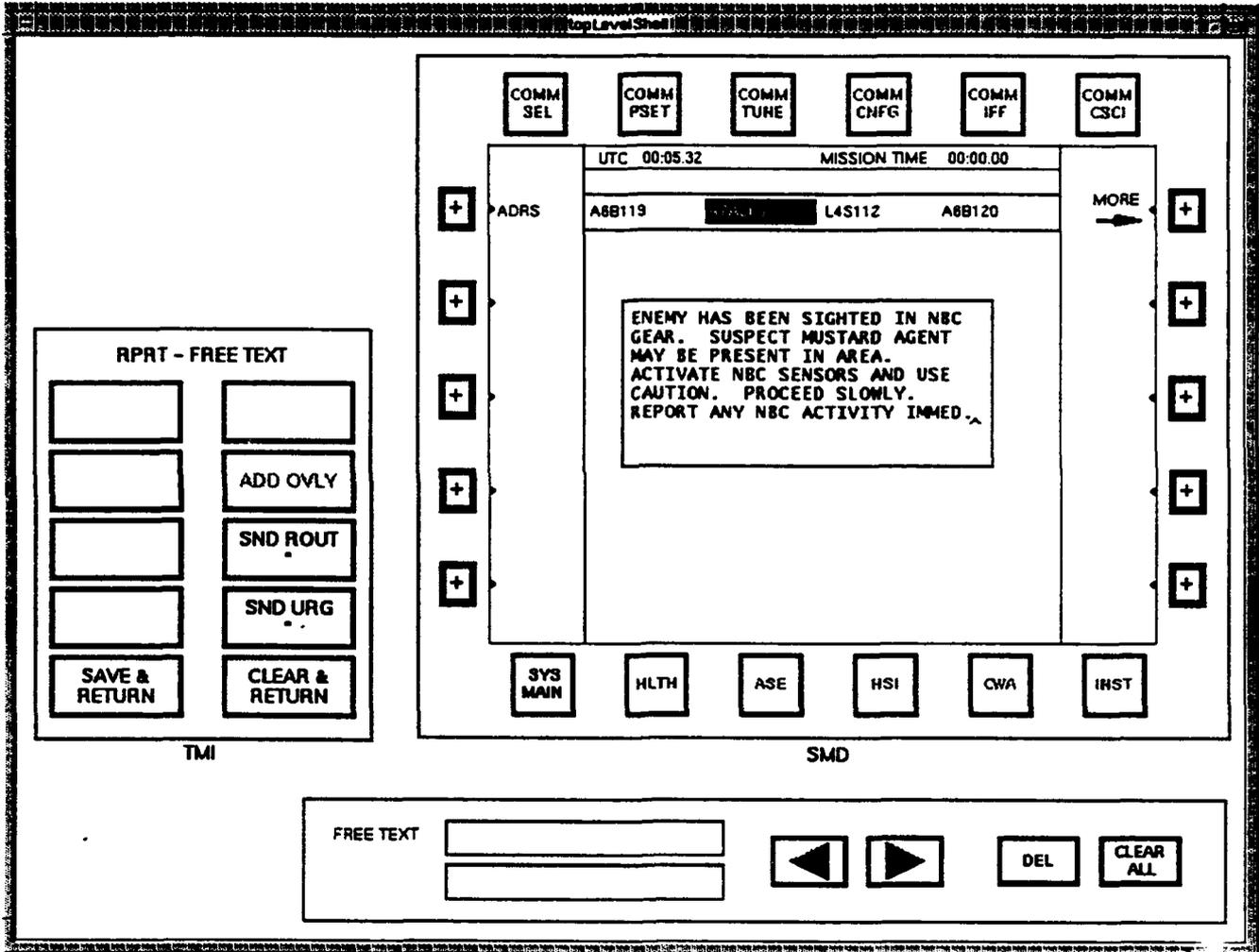
Figure 14 FREE TEXT REPORT WINDOW

Figure 15 MOVCMD REPORT WINDOW

Figure 16 MTO REPORT WINDOW

Figure 17 REQUEST REPORT WINDOW
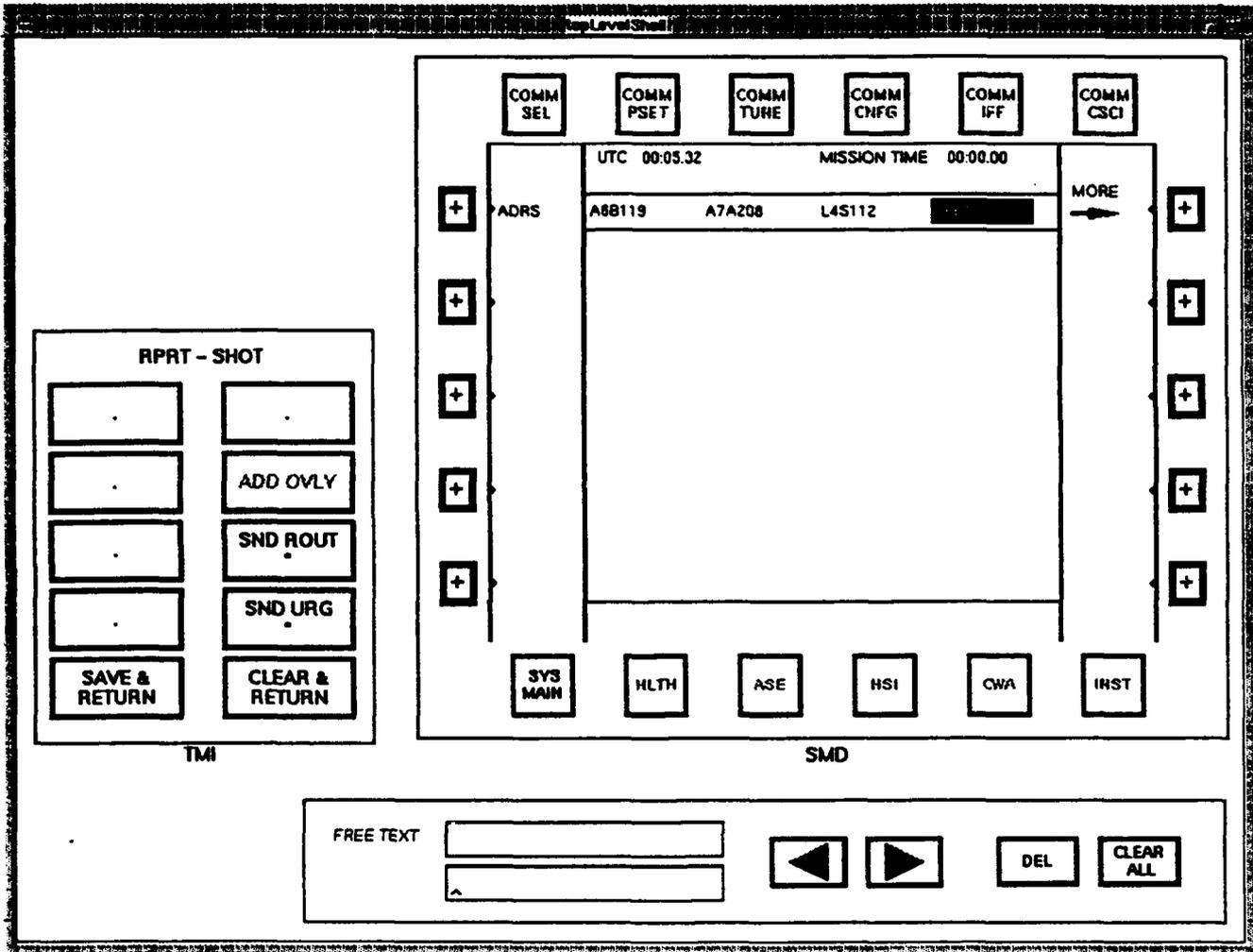
Figure 18 SHOT REPORT WINDOW
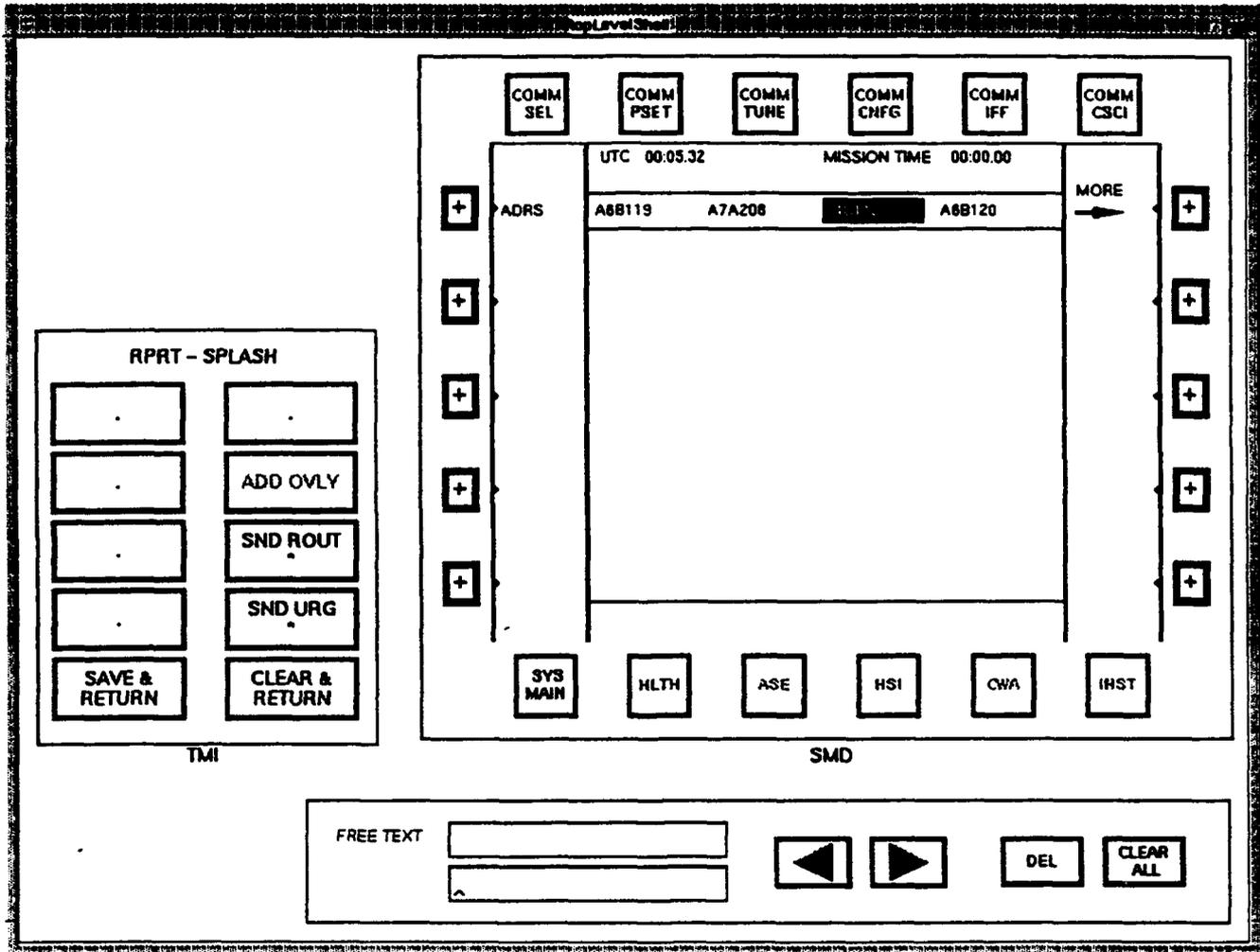
Figure 19 SPLASH REPORT WINDOW
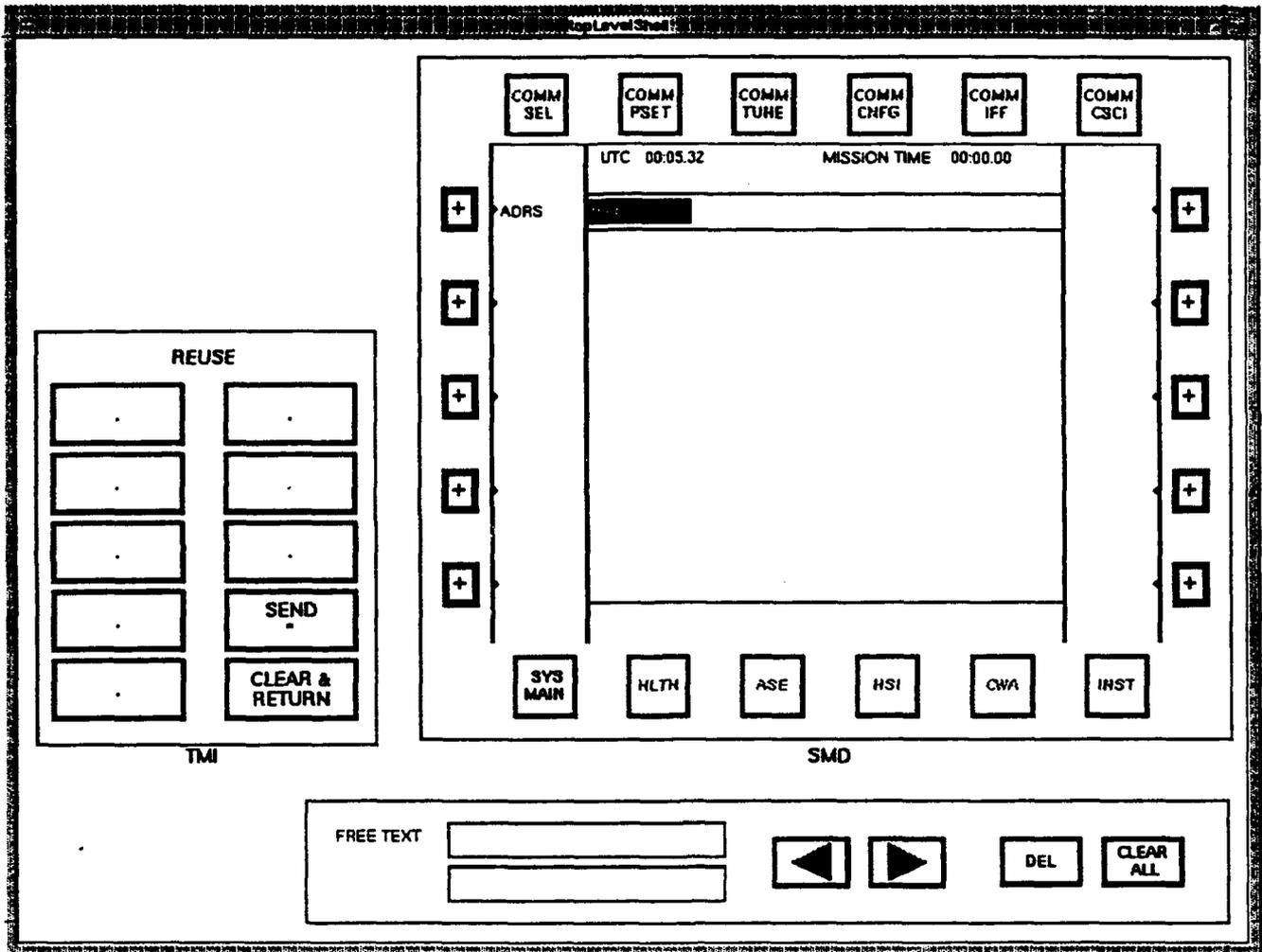
Figure 20 RE-USE REPORT WINDOW