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TM - LX-346

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TECHNICAL MEMORANDUM

(TM Series)

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COMPUTER PROGRAM DEVELOPMENT SPECIFICATION
TACTICAL DATA SYSTEM DEVELOPMENT TESTBED
(TSDT)
GRAPHICS FUNCTIONAL SOFTWARE

SYSTEM
DEVELOPMENT
CORPORATION
40 HARTWELL AVE.
LEXINGTON
MASSACHUSETTS
02173

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MODIFICATION TO:



AUTHOR'S NAME

W.F. Connors

APPROVAL SIGNATURE

R.B. Ireland

System Development Corporation/40 Hartwell Ave./Lexington, Mass. 02173

This document contains the changes to TM-LX-346/600/01, dated 1 December 1971, Final Contract End Item Detail Specification, Part I (Computer Program) Performance/Design Requirements and Detailed Technical Description, Volume 1, TDSDT TACC Functional Software. These changes contain the design requirements and detailed technical description necessary to add a graphic display capability to the TDSDT TACC Functional software. The following table identifies by page number the changes to the basic document.

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iii	Replaces Page iii
iv	Replaces Page iv
560-1 thru 560-68	Insert after Page 560
592	Replaces Page 592
599	Replaces Page 599
604	Replaces Page 604
628	Replaces Page 628
640	Replaces Page 640
685	Replaces Page 685

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GRAPHIC DISPLAYS

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3.1.2.7.8 Graphic Displays

3.1.2.7.8.1 Scope

The integration of a graphics display capability into the TDSDT requires additions and modifications to the Current Operations functional software defined in the main body of this document. This document, an insert to the TDSDT Functional Software, Part I Specifications, describes the graphics capability and defines the changes and modifications to the Current Operations functional areas required to implement this capability. This specification extends the TDSDT Current Operations Functional Software Capability to include a graphics capability and is therefore appended to TM-LX-346/600/01B.

3.1.2.7.8.2 Graphic Display Capability

The approach followed in developing the design of the Current Operation graphics support is to treat the addition of a graphics capability as an extension to the existing functional design. As such, it provides a new dimension for the performance of tasks already supported by functional software.

From a functional point of view, the graphics capability is represented by the addition of a graphics display terminal to each of the three user stations in Command Post A of the TDSDT. This results in composite user stations at which the two display terminals may be operated either as independent devices or as an integrated unit at the option of the user. When operating in an integrated mode, the graphics terminal is functionally tied to the actions taken by the user at the alphanumeric (Sanders) terminal; when operating independently, the graphic displays are controlled by mode and selection entries made at the graphics (ADAGE) terminal. However, even in an independent mode of operation, the graphic display of air situation data is limited by filter criteria inserted at the alphanumeric terminal.

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3.1.2.7.8.2.1 Graphics Display Terminal

Three graphic display terminals are provided. Each terminal includes a 12x12 display screen, an alphanumeric keyboard and a lightpen. The display screens are an integrated component of a graphic display system that includes:

- a) Ambilog 200 computer
- b) Vector generator
- c) Character generator

The Ambilog 200 computer has a memory capacity of 8K 30 bit words. Associated with Ambilog 200 in the TDSDT Configuration are a disc drive and a magnetic tape drive.

The vectors are generated at rates ranging from 5.5μ sec for a 1/2" line to 38μ sec for a 10" line. The maximum vector output per frame is:

- 2940 - 1" vectors, or
- 1660 - 3" vectors, or
- 800 - 7" vectors,

or equivalent combinations of any of the above.

Characters are generated at rates ranging from 5.5μ sec per 4 characters of text to 15μ sec per character in a single character write-space mode. The maximum output per frame is 2600 characters.

The total display output limit of the graphic display system, utilizing all three display terminals, is the sum of all data displayed at the three terminals. This sum cannot exceed 2600 characters or 2940 1" vectors or the equivalent thereof. The average displayable data is about 900 characters/vectors per display.

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The graphics display system interfaces with the Track Data Buffer Computer (PDP-8I) and the PDP-8 associated with the user stations located in Command Post A of the TDSDT. Track position and status information is transferred from the Track Data Buffer Computer to the graphics computer for the display of an Air Situation. Information from the Current Operations data base is transferred from the 1800 computer to the graphics data processor. The data is routed via the Command Post A PDP-8 computer and contains Background and Mission Adjustment information used to generate displays at the graphic terminal. Filter commands for the Track Data Buffer computer are entered at the Sanders display terminal and are transferred to the Track Data Buffer Computer via the PDP-8 and Ambilog 200 computer. (See Figure 25).

3.1.2.7.8.2.2 Graphic Displays

The 12x12 display screen associated with a graphics terminal has been divided into several functional areas. Each of these areas has been assigned a letter for identification and the space allocated to each area is illustrated in Figure 26.

Area A provides space for two lines of 64 characters each. The purpose of this area is to provide space for composing keyboard input queries.

Area B is reserved for the display of the permanent mode selection list which is always displayed. This list contains the following entries:

- ADD
- DELETE
- MAP
- OVERLAY
- IDENT
- TABULAR
- ROUTE
- TEXT
- WINDOW

Each of the entries on the list is a selectable display option with the exception of ADD and DELETE.

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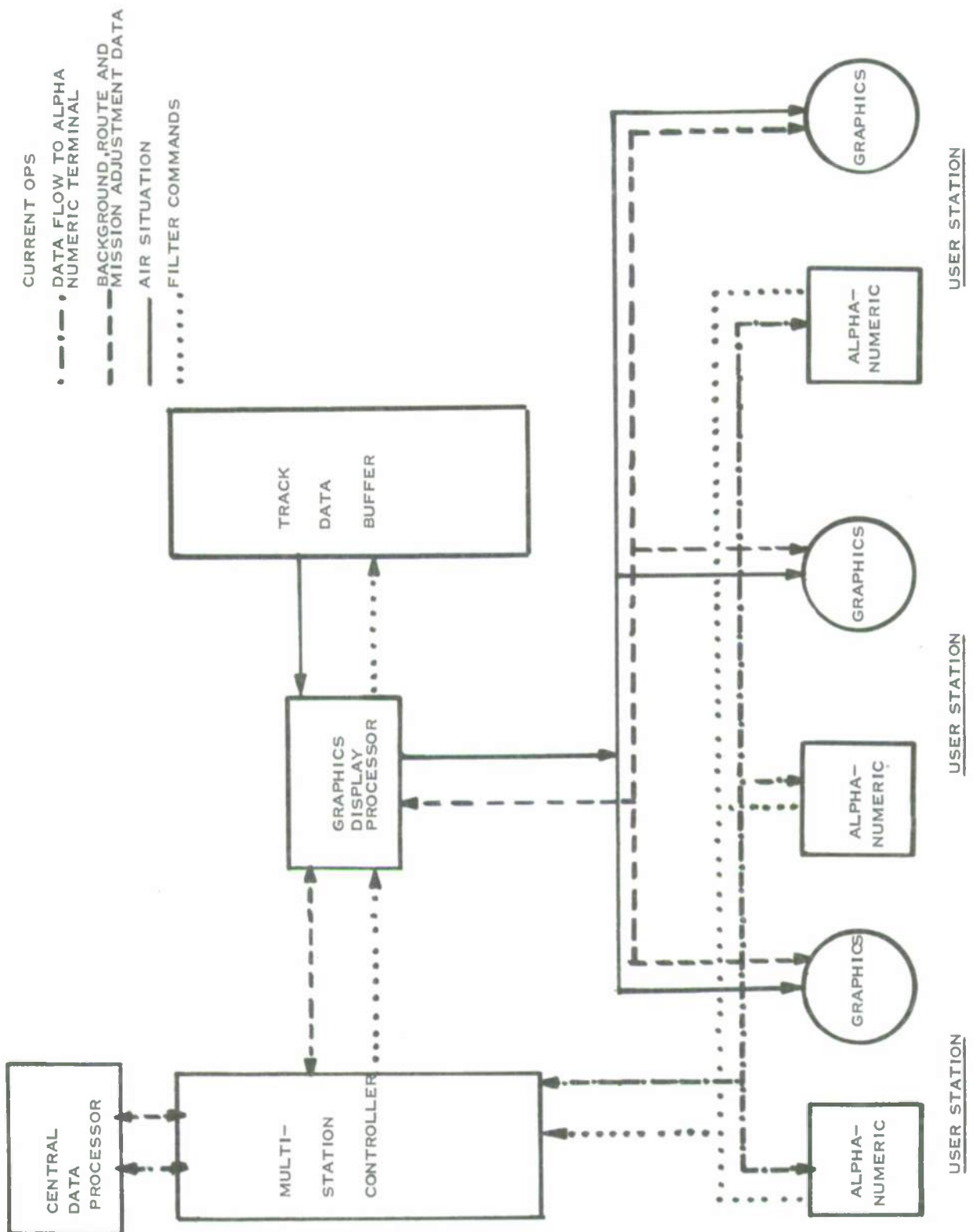
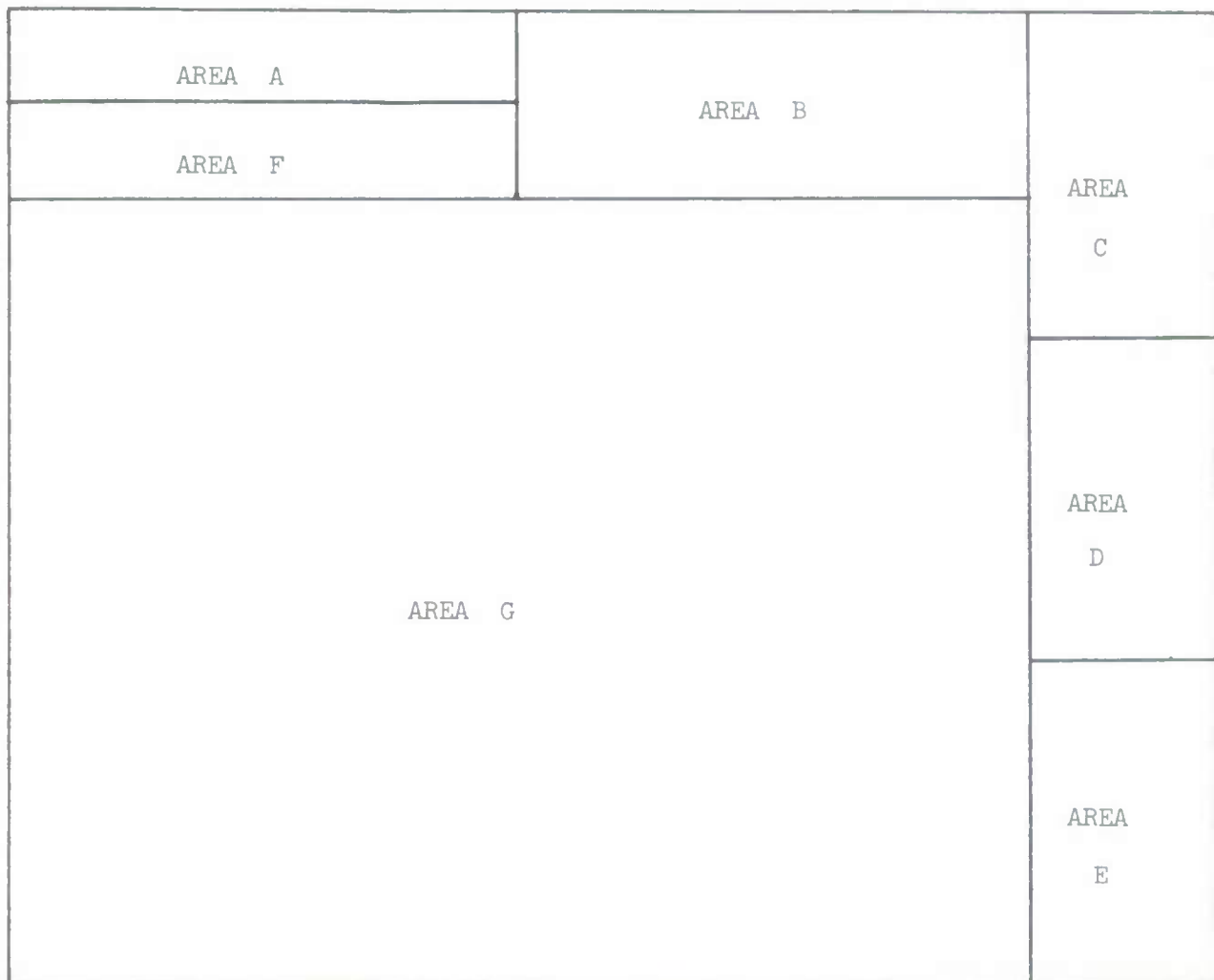


FIGURE 25. GRAPHIC DISPLAY CAPABILITY INFORMATION FLOW

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GRAPHICS DISPLAY SCREEN

SURFACE ALLOCATION

Figure 26

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Area C is reserved for the display of the variable selection sub lists. The contents of this area depends on the Area B selection.

Area D and E are reserved for the display of tabular information. Each area provides a display area of 16 lines of 8 characters of tabular data. Tabular information is used to amplify data that appears in the main geographic portion of the display.

Area F is reserved for the display of 64 characters of Legend data for the graphic information being displayed.

Area G is reserved for the presentation of geographic, air situation and graphic background data.

3.1.2.7.8.2.2.1 Permanent Mode Selections

Selection of the desired mode of operation of the graphics terminal is made by lightpenning the ADD or DELETE option and the desired mode. The following table contains a summary of display responses to the mode selection action.

MODE	VARIABLE SELECTION LIST	RESPONSE
MAP	OVERALL SECTOR 1 SECTOR 2 SECTOR 3 SECTOR 4	The map for the sublist entry selected is added or deleted from the display.
OVERLAY	A list of overlay titles	The overlay title selected from the sublist is added or deleted from the display.
IDENT	None	The LABEL for the symbol lightpenned is added or deleted from the display.
TABULAR	None	The TABULAR DATA for the symbol lightpenned is added or deleted from the display.
ROUTE	None	The ROUTE of the mission symbol lightpenned is displayed or deleted.
WINDOW	VIEWBOX EXPAND CONTRACT ZOOM	A square area of current display is expanded or contracted.
TEXT	None	Displays are converted into the alphanumeric format of the Sanders display.

This table also contains the contents of the variable selection sublist that is displayed in Area C of the display screen when the mode is selected. The variable selection sublists identify all the different display options that are available in a mode.

3.1.2.7.8.2.2.2 Display Symbols and Labels

The list shown on the following page identifies the symbols used in graphic display and assigns these symbols to specific elements of the Air Situation or Current Operations data base.

Associated with each symbol displayed, LABEL data may or may not be available for identification and information purposes. LABELs are 1x8, 2x8, or 3x8 character matrices that may be forced when the symbol of the element is displayed or may be requested by lightpen action when not forced. The selection of the IDENT mode permits label data to be added or deleted for the symbol lightpenned.

In addition to LABEL and Symbol data being associated with an element being displayed, vectors may be constructed from point to point on the display surface. This capability is used to present routes, boundaries and map information at the graphic terminal.

GRAPHIC SYMBOLS AND ASSIGNMENT

1	•	Point
2		(Undefined)
3		(Undefined)
4		Refueling Area
5		Surface Target
6		Circle (Approx)
7		SAM Site
10		Radar Site
11		Tactical Air Control Party
12		(Undefined)
13		Hot Areas
14		Cities
15	+	Route Points
16	≡	CAS Request
17	=	RECCE Request
20		Ground Forces
21		Combat Air Patrol Station
22		Enemy Electronic Order of Battle
23		Electronic Warfare Station
24		Enemy Ground Order of Battle
25		Friendly Headquarters
26		Air Force Unit
27		Naval Forces
30		Search and Rescue Stations
31		A/C in Distress or Downed A/C
32		Weather Points

3.1.2.7.8.2.2.3 Graphic Data Transfer File

The requirements to display air situation, mission adjustment and background data requires the transfer of data from the Current Operations data base at the time the system is initialized and also during the execution of a Frag Order that is being monitored by the Current Operations capability. A single transfer file format has been established for the transfer of data from the Current Operations data base to the data base of the graphic display system. This file has the format as shown on the following page.

In the Table, the Property Number, Property Name, Class, Size in Characters, Master and Slave indicator and a brief description of each property is indicated.

In each file defined for data transfer to the graphics system, the first two objects in the file shall have the following names and property values indicated.

OBJECT NO.	NAME	LAT/LONG	SIM	TAB2
1	SPECIAL1	Define UPPER left corner of display area.	No. of objects in transfer file.	Legend info for display.
2	SPECIAL2	Define LOWER right corner or display area.	--	--

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<u>Prop No.</u>	<u>Name</u>	<u>CL</u>	<u>Size</u>	<u>M/S</u>	<u>Description</u>
1	NAME	L	12	M	Object name
2	LN	L	2	S	To identify leg number for route info
3	MSN	L	10	S	To identify mission no. for routine info
4	LABEL	L	24	M	Identifies symbol label
5	LABEL1	L	8	S	Identifies 1st line of 3x8 symbol label
6	LABEL2	L	8	S	Identifies 2nd line of 3x8 symbol label
7	LABEL3	L	8	S	Identifies 3rd line of 3x8 symbol label
8	LAT	L	8	M	Latitude in degrees, minutes, seconds
9	LADEG	L	2	S	Degrees
10	LAMIN	L	2	S	Minutes
11	LASEC	L	3	S	Seconds and 10th of seconds
12	NS	L	1	S	N=North; S=South
13	LONG	L	9	M	Longitude in degrees, minutes, seconds
14	LODEG	L	3	S	Degrees
15	LOMIN	L	2	S	Minutes
16	LOSEC	L	3	S	Seconds and 10th of seconds
17	WE	L	1	S	W=West; E=East
18	VECTOR	L	1		1=start of vector
19	SIM	I	4		Symbol type
20	SO	I	4		Symbol orientation
21	SMAG	I,S	4		Symbol magnification factor
22	LPSIM	I	1		Symbol and label display option
23	TABFLAG	I	1		Tabular display information included
24	TAB1	L	64	M	1st half of tabular display information
25	SYMTYPE	L	8	S	Title data for tabular display
26-38	ID01-ID07	L	2	S	ID of line 1 thru line 7 of tabular display (even numbered properties only)
27-39	DA01-DA07	L	6	S	Data for line 1 thru line 7 of tabular display (odd numbered properties only)
40-54	ID08-ID15	L	2	S	ID of line 8 thru line 15 of tabular display (even numbered properties only)
41-55	DA08-DA15	L	6	S	Data for line 8 thru line 15 of tabular display (odd numbered properties only)

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Following these two special objects each additional point or element to be displayed is established as an object entry in the file. For each object entered the following data entries may be made in the transfer file.

NAME, LN or MSN are required only for the transfer of mission route information. No entry is required in properties 1,2 and 3 for all other graphic data transfer files.

LABEL, LABEL1, LABEL2 and LABEL3 - These properties are used to store the values to appear when the label associated with a symbol is displayed at the graphic terminal. Each label 1,2, and 3 is eight characters long.

Properties 8-17 are used to define the location on the display screen of the symbols associated with this object.

Property 18 VECTOR is an indicator as to whether or not a vector is to originate at the location specified in Properties 8-17. A value of 1 indicates a vector is required. A value of 0 indicates no vector is required. Property 19 SIM identifies the symbol type that is to be displayed for this object. A list of symbols available is contained in Table .

Property 20 SO specifies the orientation of the symbol. It may be rotated through 360° from North = 0.

Property 21 SMAG specifies the magnification factor to be applied to the symbol.

0 = normal size
+1 = +999 increase in symbol size
-1 = -999 decrease in symbol size

Property 22 LPSIM is used to specify the label option assigned to this object. The available label options are:

0 symbol is not lightpennable	4 symbol has 16 character label, forced
1 symbol has 8 character label, not forced	5 symbol has 24 character label, not forced
2 symbol has 8 character label, forced	6 symbol has 24 character label, forced
3 symbol has 16 character label, not forced	

Property 23 TABFLAG is used to indicate if tabular data has been specified for this object. The assigned values for the property are:

- 0 = no tabular data
- 1 = format of tabular data required
- 2 = text data no formatting required

When option 1 is used the data in properties TAB1 and TAB2 must be formatted at the graphic terminal as follows:

- a. The first 8 characters (SYMTYPE) become line 1 of the tabular display.
- b. Each of the 8 character fields (e.g. ID01, DA01) for the entire object must be processed as follows:
 - (1) if the 2nd character is blank, then the entire 8 character field becomes the next line of the tabular display without any additional processing
 - (2) if the 2nd character is not blank, then a blank is inserted as character 3 and the original characters 3 thru 7 become characters 4 thru 8. The result becomes the next line of the tabular display.

When option 2 is used the data in properties TAB1 and TAB2 is processed at the graphic terminal only to the extent that "carriage returns" and "line feeds" must be inserted between each 8 character field.

Property 24-55 are used for the storage of tabular data for display with this object.

For the transfer of route data the transfer file in addition to SPECIAL1 and SPECIAL2 contains an object entry for each point on the route being transferred. Each object must contain the Properties 2 and 3. Property 2 LN indicates the number of the route point or file object being transferred. Property 3 MSN is used to identify the route for retrieval and display purposes. The route number assigned to a mission route for graphic display purposes is the PLRACTA mission number assigned to the mission in the Frag Order.

The following list contains the files required for development of the Current Operations Graphic Display capability. This list contains the File Name and the Designator assigned to the File.

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FILE DESIGNATOR	FILE NAME	FILE DESIGNATOR
CMS31	27. Candidate Sched. for Station A3	CMS31
CMS32	28. Candidate Sched. for Station A3	CMS32
CMA1	29. Candidate Missions for Sta. A1	CMA1
CMA2	30. Candidate Missions for Sta. A2	CMA2
CMA3	31. Candidate Missions for Sta. A3	CMA3
CRA1	32. Candidate Requirements for Station A1	CRA1
CRA2	33. Candidate Requirements for Station A2	CRA2
CRA3	34. Candidate Requirements for Station A3	CRA3
SAPR	35. SAR Requirements	SAPR
SDC1	36. TEST 1	SDC1
SDC2	37. TEST 2	SDC2
COAST	1. Coast Line	
BOUND	2. Boundaries	
CITIES	3. Cities	
LNDMK	4. Landmark	
FEBA	5. FEBA	
EAB	6. Enemy Air Base	
EMU	7. Enemy Missile Unit	
EEOB	8. Enemy Electronic Order of Battle	
EGOB	9. Enemy Ground Order of Battle	
FHDG	10. Friendly Headquarters (Major)	
AFU	11. Air Force Units	
GFS	12. Ground Forces	
ADA	13. ADA	
TACP	14. Tactical Air Control Party	
NAV	15. Naval Forces	
SARSTA	16. Search and Rescue Stations	
REFA	17. Refueling Areas	
EWS	18. Electronic Warfare Stations	
CAP	19. Combat Air Patrol Stations	
WXP	20. Weather Points	
HOTS	21. Hot Area	
RPTS	22. Route Points	
CMS11	23. Candidate Sched. for Station A1	CMS11
CMS12	24. Candidate Sched. for Station A1	CMS12
CMS21	25. Candidate Sched. for Station A2	CMS21
CMS22	26. Candidate Sched. for Station A2	CMS22

3.1.2.7.8.3.0 Functional Requirement Definition

There are three classes of graphic displays required to support Current Operations:

Mission Adjustment

Air Situation

Background

The following sections define the functional requirements for each of these classes of displays.

3.1.2.7.8.3.1 Mission Adjustment

Mission Adjustment displays are directly related to a set of actions which may be taken by the user at his alphanumeric terminal. Except where specifically noted, these actions, the processing they initiate and the resulting alphanumeric displays are defined in Section 3.1.2.4, TM-LX-346/600/01, Part I (Computer Program) Performance/Design Requirements and Detailed Technical Description Volume I, TDSDT TACC Functional Software, dated 1 Dec 1971.

For each of the display types defined below, the specified data to be displayed is stored in fixed format transfer files. The file structure is defined in Section 2.2.3 of this document.

The following sections define the content and format for each Mission Adjustment graphic display object. The number of objects processed for display within each display type is the same as that which has been determined by the Mission Adjustment functional software for alphanumeric display. Except where specifically noted, display items correspond directly to file properties. One general exception to this rule is mission number: as carried in the Current Operations files, a mission number contains twelve characters whereas for graphics the mission number contains eight characters. The twelve character number is in the form: Unit Number-Julian Day-Mission Type and Sequence Number, i.e., 122-252-CA04. This is reduced to eight characters by removing the Julian Day and retaining the Unit Number, Mission Type and Sequence Number, i.e., 122-CA04.

3.1.2.7.8.3.1.1 Candidate Requirements

The Current Operations candidate requirement capabilities include the ability of a user station operator to specify criteria for the selection of CAS, RECCE or Target requirements for display at the alphanumeric display terminal. The display of selected candidate information at the graphics terminal associated with a user station requesting a candidate requirements display is specified in this section. There are three separate candidate requirement display requests available to an operator; 1) Candidate CAS Requirements, 2) Candidate RECCE Requirements, and 3) Candidate Target Requirements. A graphic display for each of these requests is generated when the requesting action is taken at a user station which has an associated graphics display terminal.

3.1.2.7.8.3.1.1.1 Candidate RECCE Requirements

The data necessary to generate a Candidate RECCE Requirements display shall be transferred to the graphics display system wherever a Candidate RECCE Requirements DED (CRRS) is entered by an operator at a user station with an associated graphics terminal.

3.1.2.7.8.3.1.1.1.1 Source and Type of Inputs

Inputs to the graphics display generation process are a list of selected candidates prepared by the Candidate RECCE Requirements selection process and the data base information contained in the Preplanned Air Reconnaissance Request file. For each request identified by the selection process the following data base information is required.

- a. Request Number
- b. Request Type
- c. Request Priority
- d. Request Location
- e. RECCE Type
- f. Fighter Escort Requirement
- g. Electronic Warfare Requirements
- h. Latest Time information is of value

3.1.2.7.8.3.1.1.1.2 Destination and Type of Outputs

There shall be two types of outputs required for the generation of the Candidate RECCE Requirements graphic display; 1) the graphic data transfer file and, 2) a shoulder tap message.

The format and content of the graphic data transfer file for Candidate RECCE Requirements is contained in Figure 27. For each candidate identified for display by the selection process a separate object entry is created in this file. A maximum of ten Candidate RECCE Requirements may be displayed at a time. A separate candidate requirements file has been established for each user station with a graphic display capability.

3.1.2.7.8.3.1.1.1.3 Information Processing

When the Candidate RECCE selection process has identified all RECCE Requests that meet the criteria entered, the data necessary to generate a display for the Candidate RECCE Requests being displayed at the alphanumeric terminal are retrieved from the Preplanned Air Reconnaissance Request file. The data retrieved is used to update the Label, Location and Tabular data property values for each RECCE Request in the graphic data transfer file established for the user station. In addition to the property values being set for each candidate to be displayed, control information is also set. The following graphic data transfer file properties are set to the values indicated for Candidate RECCE Requirements.

<u>Prop No.</u>	<u>Prop Name</u>	<u>Value</u>	<u>Remarks</u>
18	Vector	0	No vector
19	SIM	17	RECCE Request Symbol
20	SO	0	Symbol Orientation
21	SMAG	0	Symbol Magnification
22	LPSIM	6	3x8 Character Label forced
23	TABFLAG	2	Tabular Data is specified.

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<u>Transfer File</u> <u>Property</u>	<u>File</u>	<u>Prop</u>	<u>Value</u>	<u>Remarks</u>
1 NAME				1 thru 3 not used for RECCE REQUIREMENT
2 LN				
3 MSN				
4 LABEL				
5 LABEL1	PRECRE- QUEST	REQ-NUM TYPE		RECCE Request number Request type I or P
6 LABEL2	PRECRE- QUEST	LTIOV		Latest time info is of value
7 LABEL3	PRECRE- QUEST	PRI TYPE-RECCE		Request priority Type of RECCE requested
8-17 LOCATION	PRECRE- QUEST	TGT-LOC-A		
18 VECTOR			0	No vector
19 SIM			17	RECCE request symbol
20 SO			0	Symbol orientation
21 SMAG			0	Symbol magnification
22 LPSIM			6	3x8 character label forced
23 TABFLAG			2	non-formatted tabular data
24-56 TAB1-TAB2				

Figure 27

Candidate RECCE Requirements
Graphics Display Transfer File

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TABULAR DATA FOR RECCE REQUIREMENTS DISPLAY

<u>Transfer File Property</u>	<u>Tab Line Number</u>	<u>File</u>	<u>Prop</u>	<u>Value</u>	<u>Remarks</u>
24 TAB1					
25 SYMTYPE	1			RECCE	
26-27 IDØ1-DAØ1	2	PRECRE- QUEST	REQ-NUM		RECCE request no.
28-29 IDØ2-DAØ2	3	PRECRE- QUEST	TGT-NUM		Target no.assigned
30-31 IDØ3-DAØ3	4	PRECRE- QUEST	FTR-SUPP	FTR-SUPP	Display FTR-SUPP if value = x
32-33 IDØ4-DAØ4	5	PRECRE- QUEST	EW-SUPP	EW-SUPP	Display EW-SUPP if value = x
34-35 IDØ5-DAØ5	6	PRECRE- QUEST	DELIV-TIME		Day, hour and minutes

When the property values for all RECCE Candidates have been updated in the Graphic Data Transfer File, the Candidate RECCE Requirement Selection process generates a Shoulder TAP message identifying the file and the number of objects to be transferred. This message is sent to the Graphics System which in turn requests the transfer of the file and generates the display requested.

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The Shoulder TAP message for the transfer of Candidate RECCE Requirements has the format

COMM CRAX 01 X

(where x identifies the requesting
user station)

Message		
Field	Value	Remarks
1.Processing	COMM	Identifies program that
Keyword		transfers Candidate
Identifier		Requirements data to the
		graphic data processor
2.Transfer	CRAX	Candidate Requirements
File Identifier		Data Transfer File
3.Page No	01	Identifies page one of
		the transfer file
4.Forced Display	X	Set to identify requesting
Indicator		station so that display can
		be forced

3.1.2.7.8.3.1.1.2 Candidate CAS Requirements

The data necessary to generate a Candidate CAS Requirements shall be transferred to the graphic display system whenever a Candidate CAS Requirements DED (CCRS) is entered by an operator at a user station with an associated graphics terminal.

3.1.2.7.8.3.1.1.2.1 Source and Type of Inputs

Inputs to the graphic display generation process are a list of selected candidates prepared by the candidate selection process and the actual data base information contained in the Preplanned Close Air Support Request file necessary to generate the graphic display.

For each CAS Request identified by the selection process the following data is required.

- a. Request Number
- b. Target Location
- c. Desired time over target
- d. Recommended number of sorties
- e. Recommended aircraft type
- f. Recommended ordnance
- g. Request priority
- h. Request type

3.1.2.7.8.3.1.1.2.2 Destination and Type of Outputs

There are two types of outputs required for the generation of the Candidate CAS Requirements graphics display; 1) the graphics data transfer file and, 2) a Shoulder TAP message.

The format and content of the graphics data transfer file for candidate CAS requirements is contained in the following table. For each candidate identified by the candidate selection process a separate object entry in this file is required. A separate file has been defined for the display candidate requirement at each user station, (CRA1, CRA2, and CRA3)

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System Development Corporation
TM-LX-346/600/01B

CAS REQUIREMENTS DATA TRANSFER FILE

Transfer File Property	File	Prop	Value	Remarks
1 NAME				1 thru 3 are not required for the transfer of PCAS request data.
2 LN				
3 MSN				
4 LABEL				
5 LABEL1	PCASRE- QUEST	REQ-NUM		I/L where L is the letter value of property
		Immed/ Preplan	I P	
6 LABEL2		TAC-SIT		A or B
7 LABEL3		PRI		Request priority
		DES-RESULTS		Desired results A or B
8-17 LOCATION		TGT-LOC-A		
18 VECTOR			0	No vector
19 SIM			16	CAS symbol
20 SO			0	Symbol orientation
21 SMAG			0	Symbol magnification
22 LPSIM			6	3x8 character label forced
23 TABFLAG			2	Non-formatted tabular data
14-56 TAB1-TAB2				

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560-22

System Development Corporation
TM-LX-346/600/01BTABULAR DATA FOR CANDIDATE CAS REQUIREMENT DISPLAY

<u>Transfer File</u> <u>Name</u>	<u>Tab Line</u> <u>No.</u>	<u>File</u>	<u>Prop.</u>	<u>Value</u>	<u>Remarks</u>
24 TAB1					
25 SYMTYPE	1			CAS	Title for TAB display
26-27 IDØ1-DAØ1	2	PCASRE- QUEST	REQ-NUM		Request Number
28-29 IDØ2-DAØ2	3	PCASRE- QUEST	SENDER		
30-31 IDØ3-DAØ3	4	PCASRE- QUEST	FTR-SUPP	FTR-SUPP	Displayed if property value = x
32-33 IDØ4-DAØ4	5	PCASRE- QUEST	EW-SUPP	EW-SUPP	Displayed if property value = x
34-35 IDØ5-DAØ5	6	PCASRE- QUEST	TGT		Display 8 characters only
36-37 IDØ6-DAØ6	7	PCASRE- QUEST	NUM A/C		Recommended number of aircraft
38-39 IDØ7-DAØ7	8	PCASRE- QUEST	A/C-TYPE		Recommended aircraft type
40 TAB2					
41-42 IDØ8-DAØ8	9	PCASRE- QUEST	ORD		Recommended ordnance

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System Development Corporation
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The Shoulder TAP message for the transfer of Candidate CAS Requirements has the format

COMM CRAX 01 X

(where x identifies the requesting
user station)

Message Field	Value	Remarks
1.Processing Keyword Identifier	COMM	Identifies program that transfers Candidate Requirements data to the graphic data processor
2.Transfer File Identifier	CRAX	Candidate Requirements Data Transfer File
3.Page No	01	Identifies page one of the transfer file
4.Forced Display Indicator	X	Set to identify requesting station so that display can be forced

3.1.2.7.8.3.1.1.2.3 Information Processing

When the candidate CAS selection process has identified all CAS Requests that meet the criteria entered, the data necessary to generate a graphic display for the candidate requirements being displayed at the alphanumeric terminal are retrieved from the Preplanned Close Air Support Request file. The specific data retrieved is stored in the label, position and tabular data properties of each object in the graphics data transfer file established for user station at which the display request originated. In addition to the property values being set for each candidate to be displayed, control information is also set. The following graphics data transfer file properties are set to the values indicated in the following list for candidate CAS requests.

<u>Prop No.</u>	<u>Prop Name</u>	<u>Value</u>	<u>Remarks</u>
18	Vector	0	No vector
19	SIM	16	CAS Symbol
20	SO	0	Symbol Orientation
21	SMAG	0	Symbol magnification
22	LPSIM	6	3x8 Character label forced
23	TABFLAG	2	Tabular data is specified.

When the property values for a candidates CAS requirements to be displayed have been updated with the specified values, the Candidate CAS Selection process generates a Shoulder TAP Message identifying the transfer file and the Graphics Display System. This message is sent to the Graphics System which in turn requests the transfer of the identified file and generates the display requested.

3.1.2.7.8.3.1.1.3 Candidate Target Requirements

The data necessary to generate a Candidate Target Requirements display shall be transferred to the graphics display system whenever a Candidate Target Requirement DED (CTRS) is entered by an operator at a user station with an associated graphics terminal.

3.1.2.7.8.3.1.1.3.1 Source and Type of Inputs

Inputs to the graphic display generation process are a list of selected candidates prepared by the candidate target selection process and the actual data base information contained in the Target File necessary to generate the graphics display. For each Candidate Target identified by the selection process the following data is required.

- a. Target Number
- b. Target Location
- c. Recommended Aircraft type
- d. Recommended number of Aircraft
- e. Desired time over target
- f. Target description
- g. Target priority

The data base values of these data are used to update specified label and tabular properties in the graphic data transfer file.

3.1.2.7.8.3.1.1.3.2 Destination and Type of Outputs

There are two types of outputs required for the generation of the Candidate Targets Requirements graphic display; 1) the graphic data transfer file and, 2) a shoulder TAP message.

The format and content of the graphic data transfer file for Candidate Target Requirements is contained in the following table. For each candidate identified for display by the selection process a separate object entry is created in this file. A maximum of ten candidate targets may be displayed at one time. A separate candidate requirements graphic data transfer file has been established for each user station with a graphic display capability.

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System Development Corporation
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DATA TRANSFER FILE FOR CANDIDATE TARGET REQUIREMENT

DISPLAY

Transfer File Property	File	Prop	Value	Remarks
1 NAME				1 thru 3 are not required for Candidate Target requirements
2 LN				
3 MSN				
4 LABEL				
5 LABEL1	TGT	TGT-NUM		Target number
6 LABEL2	TGT	DTOT		Desired time over target date/hr and minute
7 LABEL3	TGT TGT	TGT-PRI MSN-TYPE		Target priority Mission type (CA/IN)
8-17 LOCATION	TGT	TGT-LOC		
18 VECTOR			0	No vector
19 SIM			5	Target symbol
20 SO			0	Symbol orientation
21 SMAG			0	Symbol magnification
22 LPSIM			6	3x8 character label forced
23 TABFLAG			2	Non-formatted tabular data

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System Development Corporation
TM-LX-346/600/01BTABULAR DATA FOR CANDIDATE TARGET DISPLAY

Transfer File Property	Tab Line No.	File	Prop	Value	Remarks
24 TAB1					
25 SYMTYPE	1			TARGET	Title for tabular data
26-27 IDØ1- DAØ1	2	TGT	TGT-NUM		Target number e.g. BT14
28-29 IDØ2- DAØ2	3	TGT	F-SUPP	FTR-SUPP	Displayed if property value = x
30-31 IDØ3- DAØ3	4	TGT	EW-SUPP	EW-SUPP	Displayed if property value = x
32-33 IDØ4- DAØ4	5	TGT	TGT-DESCRIP		Only 1st 8 characters of property displayed
34-35 IDØ5- DAØ5	6	TGT	A/C-TYPE		Recommended aircraft type
36-37 IDØ6- DAØ6	7	TGT	SORT		Recommended no. of aircraft
38-39 IDØ7- DAØ7	8	TGT	REC-ORD-1 REC-ORD-2		Recommended ordnance codes 1 and 2
40 TAB2					
41-42 IDØ8- DAØ8	9	TGT	LTOT		Latest time on target day/ hr/minute

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560-28

System Development Corporation
TM-LX-346/600/01B

The Shoulder TAP message for the transfer of Candidate Target Requirements has the format

COMM CRAX 01 X

(where x identifies the requesting
user station)

Message Field	Value	Remarks
1.Processing Keyword Identifier	COMM	Identifies program that transfers Candidate Requirements data to the graphic data processor
2.Transfer File Identifier	CRAX	Candidate Requirements Data Transfer File
3.Page No	01	Identifies page one of the transfer file
4.Forced Display Indicator	X	Set to identify requesting station so that display can be forced

3.1.2.7.8.3.1.1.3.3 Information Processing

When the candidate target selection process has identified all targets that meet the criteria entered, the data necessary to generate a graphic display for the Candidate Targets being displayed at the alphanumeric terminal are retrieved from the Target file. The specific data retrieved is used to update the Label, Location and Tabular data property values for each target in the graphic data transfer file established for the user station. In addition to the property values being set for each candidate to be displayed, control information is also set.

The following graphics data transfer file properties are set to the values indicated in the following list for Candidate Targets.

<u>Prop No.</u>	<u>Prop Name</u>	<u>Value</u>	<u>Remarks</u>
18	Vector	0	No vector
19	SIM	5	Target Symbol
20	SO	0	Symbol orientation
21	SMAG	0	Symbol magnification
22	LPSIM	6	3x8 Character label forced
23	TABFLAG	2	Tabular data is specified.

When the property values for all Candidate Targets have been updated in the graphics data transfer file, the Candidate Target Selection process generates a Shoulder TAP Message identifying the file and length to be transferred. This message is sent to the Graphic System which in turn requests the transfer of the identified file and generates the display requested.

3.1.2.7.8.3.1.1.4 SAR Requirements

Data for the SAR Requirements graphic display shall be generated and transferred to the graphic display system whenever the SAR Assignment DED (SRAD) is entered by an operator at a user station which has an associated graphic display capability. Each time the SAR Assignment action is taken, SAR Requirement data is transferred to the graphic system for display at the associated graphic terminal.

3.1.2.7.8.3.1.1.4.1 Source and Type of Inputs

The data inputs required for the generation of the SAR Requirements graphic display consist primarily of data contained in the Search and Rescue Requirements data base file. For each SAR Requirement for which an assignment action is made the following data are required.

- a. Requirement number
- b. Mission number of aircraft down or in distress
- c. Track number (PLRACTA)
- d. Airborne/Ground indicator
- e. Location
- f. Time of Distress/Downed Report
- g. Current Location
- h. Mission number of Assigned Rescue Missions

3.1.2.7.8.3.1.1.4.2 Destination and Type of Outputs

Two types of data outputs are required for the generation SAR Requirements graphic display; 1) the graphics data transfer file, and, 2) a Shoulder TAP message. The identification of the transfer file for SAR Requirements is SARR. This file contains a maximum of 12 SAR requirements. The format and content of the SARR transfer file is contained in the following table.

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SAR REQUIREMENT GRAPHIC DATA TRANSFER FILE

Transfer File	Property	File	Prop	Value	Remarks
1.	NAME				1 thru 3 not used for SAR Requirements
2.	LN				
3.	MSN				
4.	LABEL				
5.	LABEL1	SARREQ	REQ-NUM		SAR Requirements No.e.g. SAR05
6.	LABEL2	SARREQ	MSN-NUM		Downed or In Distress aircraft mission number e.g. 111-CA03
7.	LABEL3	SARREQ	A/B-GRD		Airborne or Ground indicator
8-17.	LOCATION	SARREQ	CURR-LOC		LAT/LONG values for A/C in distress or downed
18.	VECTOR			0	No vector required
19.	SIM			31	Symbol assigned
20.	SO			0	Symbol orientation
21.	SMAG			0	Symbol magnification
22.	LPSIM			6	3x8 character matrix forced
23.	TABFLAG			2	Tabular data is included in the file.

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System Development Corporation
TM-LX-346/600/01B

TABULAR DATA

Transfer File Prop	Tab Line No.	File	Prop	Value	Remarks
24. TAB1					
25. SYM TYPE	1			SAR	Tab title
26-27. ID01-DA01	2	SARREQ	REQ-NUM		SAR Requirement No.
28-29. ID02-DA02	3	SARREQ	MSN-NUM		Mission number for downed or distressed A/C
30-31. ID03-DA03	4	SARREQ	PMNO		PLRACTA Assigned for Air Situation data
32-33. ID04-DA04	5	SARREQ	SAR-MSN-01		Identification of SAR Msn.assigned to this SAR
34-35. ID05-DA05	6	SARREQ	SAR-MSN-02		Requirement
36-37. ID06-DA06	7	SARREQ	SAR-MSN-03		
38-39. ID07-DA07	8	SARREQ			Time of down or dis- tress report.

The Shoulder TAP message generated for the transfer of SAR Requirements data to the graphics terminal has the following content:

COMM SARR 01 U

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Field No	Field Description	Value	Remarks
1	Message Identification keyword	COMM	Identifies program that transfers the SAR Requirement data when requested by the graphics processor.
2	Transfer File Name	SARR	SAR Requirements transfer file identifier.
3	Page Number	01	Identifies the first page (5 objects) to be requested for transfer by the graphics processor.
4.	Forced Display Indicator	U	Display is not forced.

3.1.2.7.8.3.1.1.4.3 Information Processing

Each time an operator at a user station with an associated graphic display capability takes the SAR Assignment action the Label, Location and Tabular property/values required for the transfer of SAR requirements data to the graphic terminal are retrieved for each SAR Requirement identified in the SAR Requirement file. This data is used to update an object for each requirement in the graphic data transfer file. The following control properties are set to values indicated for each object.

PROPERTY	VALUE	REMARKS
VECTOR	0	No vector required
SIM	31	Downed or Distress A/C
SO	0	Symbol orientation
SMAG	0	Symbol magnification
LPSIM	6	3x8 Character label forced
TABFLAG	2	tabular data is specified

When the transfer file update has been completed by the SAR Assignment function the Shoulder TAP message (COMM SARR 01 U) is generated and transferred to the graphics display processor which in turn requests the transfer of the SARR transfer file and stores the data in the graphics data base.

3.1.2.7.8.3.1.2 Candidate Missions

The data required to generate a graphic display of candidate missions are generated and transferred to the graphic display system when either the Candidate Fighter Mission Selection DED (CFMS) or the Candidate RECCE Mission Selection DED (CRMS) is entered by an operator at a user station with an associated graphic display capability. The graphic display generated contains a maximum of 10 candidate missions and represents the same missions that are presented on the alphanumeric display terminal when the display of candidate missions is requested.

3.1.2.7.8.3.1.2.1 Candidate Fighter Missions

The candidate fighter mission selection process shall prepare a list of candidate missions that meet the selection criteria input by an operator. From this list of selected candidates, graphic displays for candidate missions are generated.

3.1.2.7.8.3.1.2.1.1 Source and Type of Inputs

Two types of input data are required to prepare the necessary data for the generation of a candidate mission graphic display. A list of candidate missions prepared by the Candidate Fighter Mission Selection process is required. This list identifies by file and mission, the missions that qualify as candidates. Candidate missions are contained in either Immediate Close Air Support Frag Order file or the Preplanned Fighter Frag Order/ Mission Schedule file. The information retrieved for missions identified in these files is listed below.

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Preplanned Fighter Frag Order/Mission Schedule File

- a. Mission number
- b. Mission status
- c. Target/Request number
- d. Target/Request priority
- e. Number and type aircraft
- f. Ordnance code
- g. Estimate time over target
- h. Departure base
- i. Departure base location

Immediate Close Air Support Frag Order File

- a. Unit Identifier
- b. Departure base identifier
- c. Departure base location

3.1.2.7.8.3.1.2.1.2 Destination and Type of Outputs

Two types of output data are required for the generation of graphic displays for Candidate Fighter Missions; 1) a graphics data transfer file containing the data to be displayed, and 2) a Shoulder TAP message.

The format and content of the graphics data transfer file for Candidate Fighter Missions are contained in the following table. This file contains a maximum of 10 Candidate Fighter Missions. A separate file for each graphic display terminal has been established. These files are identified CMA1, CMA2 and CMA3 for user station A1, A2 and A3 respectively.

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System Development Corporation
TM-LX-346/600/01BCANDIDATE FIGHTER MISSION DATA TRANSFER FILE

<u>Transfer File Property</u>	<u>File</u>	<u>Prop</u>	<u>Value</u>	<u>Remarks</u>
1. NAME				1 thru 3 not used for Fighter Candidate.
2. LN				
3. MSN				
4. LABEL				
5. LABEL1	ICASFRAG	UNIT TYPE		Identifies 1st unit at base with candidates.
	PFTRFRAG/ MSN	UNIT		Unit type must be supplied by process for Candidate Fighter Mission.
	PFTRFRAG/ MSN			Modified to 8 characters to identify Airborne Candidate mission.
6. LABEL2	(Same as LABEL1)			Identifies 2nd unit at base with candidates.
	PFTRFRAG/ MSN	TGT-NUM TGT-PRI		Used for Airborne Candidate CA/IN msns. only.
7. LABEL3	(Same as LABEL1)			Identified 3rd unit at base with candidates.
	PFTRFRAG/ MSN	A/C-TYPE SORT		Used for Airborne Candidate Missions only.
8-17. LOCATION	UNITPLAN	HOME-BASE- CO/DISP- BASE-CO		The location of departure base of Immediate Candidates is contained in Unit Planning File.
	PFTRFRAG/ MSN	DEP-BASE- LOC		Used to locate unit no.display for Preplanned Non-airborne Candidate Msns.
		LAT/LONG		For Airborne Candidate Msns. the current position is calculated & stored in this property.
18. VECTOR			0	No vector.
19. SIM			1	Symbol assigned for non-airborne candidates.
			6	Symbol assigned to present position of Airborne Candidates.

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CANDIDATE FIGHTER MISSION DATA TRANSFER FILE (Cont.)

<u>Transfer File</u> <u>Property</u>	<u>File</u>	<u>Prop</u>	<u>Value</u>	<u>Remarks</u>
20. SO			0	Symbol orientation
21. SMAG			0	Symbol magnification
22. LPSIM			6	3x8 character label forced
23. TABFLAG			0	No tabular data associated with Non-airborne Mission Candidates
			2	For Airborne Candidates only

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TABULAR DATA

Transfer File Property	Tab Line No.	File	Prop	Remarks
24. TAB1				
25. SYMTYPE	1		FIGHTER	Identifies TAB area display
26-27. ID01- DA01	2	PFTRFRAG/ MSN	MSN-NUM	Candidate mission number
28-29. ID02- DA02	3	PFTRFRAG/ MSN	ORD-1	Ordnance code of Airborne Candidate
30-31. ID03- DA03	4	PFTRFRAG/ MSN	TIME-14	Estimated time over target
32-33. ID04- DA04	5	PFTRFRAG/ MSN	ALT-TGT-1 Alt-TGT-1 PR	Alternate Target-1 and Priority Assigned.
34-35. ID05- DA05	6	PFTRFRAG/ MSN	ALT-TGT-2 ALT-TGT-2 PR	Alternate Target-2 and Priority Assigned.
36-37. ID06- DA06	7	PFTRFRAG/ MSN	SUP-MSN-1	Fighter Support Mission
38-39. ID07- DA07	8	PFTRFRAG/ MSN	SUP-MSN-2	EW Support Mission
40. TAB2				
41-42. ID08- DA08	9	PFTRFRAG/ MSN	TIME-16	Estimated time of return

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The Shoulder TAP message generated by the Candidate Missions Selection process has the following content and format:

COMM CMA x 01 x

Message Field	Value	Remarks
1. Message Identification Keyword	COMM	Identifies program that transfers Candidate Msn data to graphic processor
2. Transfer file name	CMAx	x is a number identifying the file assigned to requesting station
3. Page number	01	Identifies the 1st page of the file to be transferred
4. Forced Display Indicator	x	Display is forced at user station graphic terminal requesting Candi- date Mission display

3.1.2.7.8.3.1.2.1.3 Information Processing

For the generation of the Candidate Fighter Mission display at the graphic terminal it is necessary to identify the Candidate Missions to be displayed from the list of candidates prepared by the Candidate Mission Selection process. For each mission identified the retrieval of data from the Frag Order File identified is accomplished.

For Candidate Missions retrieved from the Preplanned Fighter Frag Order Mission file a test is made to determine if the mission is active, that is, Status value is equal to A. If the mission is not active, the unit identifier and departure base location is used to update an object in the Transfer File.

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If the mission is active the current position of the mission is calculated and this position is used together with mission number, target/request number and priority, and estimated time over target to update and object in the transfer file. The required tabular display properties are also updated. For Immediate Candidate Missions the departure base identified in the Immediate CAS Frag Order file is used to retrieve the location of the identified base from the Unit Plan file for the unit. The unit number and type, and the departure base location is used to update an object in the transfer file.

The following values are set for the display control properties of each object updated in the transfer file.

<u>Transfer file Property</u>	<u>Value</u>	<u>Remarks</u>
VECTOR	0	No vector required
SIM	1	For Non-airborne Candidate Msns.
	6	For Airborne Candidate Missions
SO	0	Symbol orientation
SMAG	0	Symbol magnification
LPSIM	6	3x8 character label forced
TABFLAG	0	For Non-airborne Candidates
	2	For Airborne Candidates

When the graphics data transfer file has been updated for each object to be displayed the process generates the Shoulder TAP message (COMM CMA x 01, where x identifies the requesting station) and this message is transferred to the graphics display processor which in turn requests the transfer of the file data and generates the requested display.

3.1.2.7.8.3.1.2.2 Candidate RECCE Missions

The candidate RECCE mission selection process prepares a list of candidate missions that meet the selection criteria input by an operator. From this list of selected candidates graphic displays for candidates missions are generated.

3.1.2.7.8.3.1.2.2.1 Source and Type of Inputs

Two types of input data are required to prepare the necessary data for the generation of a candidate mission graphic display. A list of the candidate missions prepared by the Candidate RECCE Mission Selection process is required. This list identifies by file and mission, the missions that qualify as candidates. Candidate Missions are contained in either the Immediate Reconnaissance Frag Order file or the Pre-planned Reconnaissance Frag Order/Mission Schedule file. The information retrieved from these files is listed below.

- Mission Number
- Mission Status
- Request Priority
- Request Number
- Number and Type Aircraft
- Type of RECCE
- Estimated Time over Target
- Departure Base
- Departure Base Location
- Unit Identifier

3.1.2.7.8.3.1.2.2.2 Destination and Type of Outputs

Two types of data outputs are required for the generation of graphic displays for the candidate RECCE missions; 1) a graphic data transfer file containing the data to be displayed, and, 2) a Shoulder TAP message.

The format and content of the graphics data transfer file are contained in the following table. This file contains a maximum of 10 candidate RECCE missions. A separate candidate mission file has been established for each graphics display terminal. These files are identified as CMA1, CMA2 and CMA3 for user station A1, A2 and A3 respectively.

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560-42

System Development Corporation
TM-LX-346/600/01BTRANSFER FILE FOR CANDIDATE RECCE MISSION DISPLAY

<u>Transfer File Property</u>	<u>File</u>	<u>Prop</u>	<u>Value</u>	<u>Remarks</u>
1. NAME				1 thru 3 are not used
2. LN				for Candidate RECCE Msn.
3. MSN				
4. LABEL				
5. LABEL1	IRECFRAG PRECFRAG/ MSN	UNIT TYPE UNIT		Identifies 1st unit at base with Candidate Msns.
	PRECFRAG/ MSN	MSN-NUM		Only for Airborne msns.
6. LABEL2	(Same as LABEL1)			Identifies 2nd unit at base with Candidate Msns.
	PRECFRAG/ MSN	REQ-NUM-1 REQ-PRT-1		Only for Airborne Msns.
7. LABEL3	(Same as LABEL1)			Identifies 3rd unit at base with Candidate Msns.
	PRECFRAG/ MSN	A/C-TYPE SORT		Only for Airborne missions
8-17. LOCATION	UNITPLAN	HOME-BASE-CO/ DISP-BASE-CO		Location of departure base for Immediate Candidates
	PRECFRAG/ MSN	DEP-BASE-LOC		Only for Preplanned Non- airborne Candidates
			LAT/LONG	Position computed by pro- cess for current position of Airborne Candidate Msns.
18. VECTOR			0	No vector required
19. SIM			1 or 6	1=non-airborne;6=airborne
20. SO			0	Symbol orientation
21. SMAG			0	Symbol magnification
22. LPSIM			6	3x8 character label forced
23. TABFLAG			0 or 2	0=non-airborne;2=airborne

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System Development Corporation
TM-LX-346/600/01BTABULAR DATA FOR CANDIDATE RECCE MISSION DISPLAY

<u>Transfer File</u> <u>Property</u>	<u>Tab Line</u> <u>No.</u>	<u>File</u>	<u>Prop</u>	<u>Value</u>	<u>Remarks</u>
24 TAB1					
25 SYMTYPE	1			RECCE	Identifes TAB area display
26-27 ID01- DA01	2	PRECFRAG/MSN-NUM MSN			Airborne Candidate Msn No.
28-29 ID02- DA02	3	PRECFRAG/REQ-NUM-1 MSN			Request Number -1
30-31 ID03- DA03	4	PRECFRAG/TIME-1 MSN			Hrs and minutes time over target Req #1
32-33 ID04- DA04	5	PRECFRAG/REQ-NUM-2 MSN			Request Number -2
34-35 ID05- DA05	6	PRECFRAG/TIME-4 MSN			Time over target REQ #2
36-37 ID06- DA06	7	PRECFRAG/REQ-NUM-3 MSN			Request Number -3
38-39 ID07- DA07	8	PRECFRAG/TIME-7 MSN			Time over Target Req #3
40 TAB2					
41-42 ID08- DA08	9	PRECFRAG/REQ-NUM-4 MSN			Request Number -4
43-44 ID09- DA09	10	PRECFRAG/TIME -10 MSN			Time over Target Req #4
45-46 ID10- DA10	11	PRECFRAG/SUP-MSN-1 MSN			Fighter Support Mission
47-48 ID11- DA11	12	PRECFRAG/SUP-MSN-2 MSN			EW Support Mission
49-50 ID12- DA12	13	PRECFRAG/TIME-31 MSN			Estimated time to return

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The Shoulder TAP message generated by the Candidate Mission Selection process has the following format and content:

COMM CMAx 01 x

where x identifies the requesting user station.

Message Field	Value	Remarks
1 Message Identification Keyword	COMM	Identifies program that transfers Candidate Mission data to the graphic processor.
2 Transfer File Name	CMAx	x is a number identifying the file assigned to requesting station.
3 Page number	01	Identifies first page of the transfer file
4 Forced Display Indicator	x	Display is forced at the user station graphic terminal requesting Candidate RECCE Mission display.

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3.1.2.7.8.3.1.2.2.3 Information Processing

For the generation of the Candidate RECCE Mission display at the graphic terminal it is necessary to identify the Candidate Missions to be displayed from the list of candidates prepared by the Candidate Mission Selection process. For each mission identified the retrieval of data from the Immediate or Preplanned Frag Order file for RECCE missions is accomplished. For Candidate Missions retrieved from the Preplanned RECCE Frag Order Mission File a test is made to determine if the mission is active. If the mission is not active the unit identifier and departure base location is used to update an object in the Transfer File.

If the mission is active the current position of the mission is calculated and this position is used together with mission number, request number, priority, estimated time over target, and support mission numbers to update an object in the transfer file for the airborne candidate mission.

The following values are set for the display control properties of each object updated.

Transfer file Property	Value	Remarks
VECTOR	0	No vector required
SIM	1 or 6	1=no airborne candidate 6=airborne candidates
SO	0	Symbol orientation
SMAG	0	Symbol magnification
LPSIM	6	3x6 character label found
TABFLAG	0 or 2	0 for non-airborne 2 for airborne candidates

When the graphic data transfer file has been updated for each object to be displayed the process generates the Shoulder TAP message, COMM CMax 01,(where x identifies the requesting station) and this message is sent to the graphics display processor which in turn requests the transfer of the file data and generates the requested display.

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3.1.2.7.8.3.1.3 Candidate Mission Schedule Display

The data necessary to generate a graphics display of candidate mission schedules shall be transferred to the graphics display system whenever the Candidate Fighter or RECCE Mission Schedule display request actions are taken at a user station which has an associated graphic display terminal. The candidate mission schedule selection process identifies as many as two candidate missions for which schedules are prepared and displays are generated.

3.1.2.7.8.3.1.3.1 Candidate Fighter Mission Schedule Display

This display is generated for candidate fighter missions selected as candidates for specific requests or targets identified in the Candidate Fighter Mission Schedule(DED CFMS) request action.

3.1.2.7.8.3.1.3.1.1 Source and Type of Inputs

The input data required to generate a graphic display of a candidate fighter mission schedule are of several types; 1) the mission identification, route and scheduled time information, and 2) mission data related to the selected candidate mission. The candidate fighter mission is identified by the candidate mission schedule selection process. The identification of the candidate mission permits the retrieval from the Preplanned Fighter Frag Order Mission Schedule file or the Immediate CAS Frag Order file , the Aircraft Type, Departure Base, Estimated Time of Departure, and Mission Status.

From the data contained in the display request for the Candidate Fighter Mission Schedule the Ingress and Egress point, target or request number and time over target information may be available for the purpose of defining the route for the selected candidate fighter mission.

3.1.2.7.8.3.1.3.1.2 Destination and Type of Outputs

There are two types of output data required for the generation of candidate fighter mission schedules; 1) a graphic data transfer file is required for

each candidate fighter mission schedule to be displayed, and 2) a Shoulder TAP message.

The graphic transfer file format for candidate fighter mission schedule display contains an object entry for each point on the route of the candidate mission. The identification and location of each point on the route is determined by the candidate fighter mission schedule process. The following table identifies the label, location and symbol property entries in the transfer file for each type of route point that may be used to define a candidate fighter mission route.

Route Point Type	LABEL1	LABEL2	LABEL3	Location	Symbol
1 Departure Base	Identifier	MSN-NUM	ETD	Departure Base	15
2 Rendezvous Point	REND	MSN-NUM	---	Rendezvous Point	15
3 Pre Refuel Point	Refuel Area ID	MSN-NUM	EST TIME	Pre Refuel Control Point	4
4 Ingress Offset Point	Code	MSN-NUM	EST TIME	Offset Point Location	15
5 Ingress Point	Identifier	MSN-NUM	EST TIME	Ingress Point Location	15
6 Target/Request Point	Tgt/Req Num	MSN-NUM	EST TIME	Target/Request Location A	5/16
7 Egress Point	Code	MSN-NUM	EST	Egress Point	15
8 Egress Offset Point	Code	MSN-NUM	EST TIME	Offset Point Location	15
9 Post Refuel	Refuel Area ID	MSN-NUM	EST TIME	Post Refuel Control Point	4
10 FAC Control Point	Callsign	MSN-NUM	EST TIME	FACP Control Point Location	11
11 Recovery Base	Identifier	MSN-NUM	ETR	Recovery Base	15

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For Candidate Fighter Missions Schedule display of missions that are currently airborne at the time of the display request the first route point for display purposes is the current position of the mission. The data entered in the transfer file for current position for a Candidate Fighter Mission Schedule display contains the following data:

<u>Route Point</u>	<u>Label 1</u>	<u>Label 2</u>	<u>Label 3</u>	<u>Location</u>	<u>Symbol</u>	<u>Remarks</u>
Current Position	MSN-NUM	PLRACTA TK NO.	NO.&TYPE A/C	LAT/LONG	6	Current position is calculated by the Candidate Fighter Mission Schedule process.

All route points for Candidate Fighter Mission Schedules, identification, location and estimated times are provided to the Candidate Fighter Mission processor by the route generation processing function.

The Shoulder TAP message generated by the Candidate Fighter Mission Schedule process to initiate the transfer of mission schedule display data has the following format and content.

COMM CMSXX 01 X

<u>Message Field</u>	<u>Value</u>	<u>Remarks</u>
1. Processing Keyword Identifier	COMM	Identifies program that transfers Candidate Fighter Mission Schedule data to graphic processor.
2. Transfer File Identifier	CMSXX	XX is a number identifying the file and station for Candidate Fighter Mission Schedule data transfer.
3. Page Number	01	Identifies page one of the transfer file.
4. Forced Display Indicator	X/U	X = Display is forced to the station identified in this field. U = The display is not forced. The transfer file for the 2nd Candidate Fighter Mission Schedule is not forced to the requesting station.

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3.1.2.7.8.3.1.3.1.3 Information Processing

All data necessary to generate the graphic display of a candidate fighter mission schedule is provided by the candidate fighter mission schedule processor. For the candidates selected by this process for display all current position and route information is available from the route generation process. The data generated by this process is used to generate the necessary entries in the graphic data transfer file for the candidate fighter mission schedule display. A separate transfer file is to be prepared for each candidate fighter schedule to be displayed.

The display control properties for each object (route point) contained in a transfer are set to the values indicated in the following table.

<u>Property</u>	<u>Value</u>	<u>Remarks</u>
Vector	1	Set to 0 for last point on route as specified for each type of route point
Sim		
SO	0	Symbol orientation
SMAG	0	Symbol magnification
LPSIM	6	3x8 character label forced
TABFLAG	0	No tabular data specified

When the transfer files have been updated as required, the Shoulder TAP message necessary to initiate the transfer of data to the graphics processor is generated and sent. The graphics processor in turn requests the transfer candidate fighter mission schedule data and generates the display requested.

3.1.2.7.8.3.1.3.2 Candidate RECCE Mission Schedule Display

This display is generated for Candidate RECCE Missions selected as candidates for specific requests identified in the Candidate RECCE Mission Schedule (DED CRMS) request action.

3.1.2.7.8.3.1.3.2.1 Source and Type of Inputs

The input data required to generate a graphic display of a Candidate RECCE Mission schedule are of two types: 1) the mission identification, route and schedule time information, and, 2) mission data related to the selected Candidate Mission. The Candidate Mission is identified by the candidate mission selection process. The identification of the Candidate Mission permits retrieval from the Preplanned RECCE Frag Order/Mission Schedule file or the Immediate Air RECCE Frag Order file, the Aircraft type, Departure Base, Estimated time of departure and Mission Status.

From the data contained in the display request for the Candidate RECCE Mission Schedule Display the Ingress and Egress point, RECCE Request number and Time over Target information may be available for the purpose of defining the route for the Candidate Mission. This information is converted into route point and estimated arrival time information by the candidate selection and route generation process.

3.1.2.7.8.3.1.3.2.2 Destination and Type of Output

There are two types of output data required for the generation of Candidate RECCE Mission schedules; 1) a graphics data transfer file is required for each of two candidate RECCE mission schedules that may be produced by the process, and, 2) a Shoulder TAP message.

The graphic transfer file format for Candidate RECCE Mission Schedule Display contains an object entry for each point on the route of the candidate mission. The identification and location of each point on the route is determined by the Candidate RECCE Mission Schedule process. The following table identifies the label, location and symbol property entries in the transfer for each type of route point that may be used to define a Candidate RECCE Mission route.

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<u>Route Point Type</u>	<u>LABEL1</u>	<u>LABEL2</u>	<u>LABEL3</u>	<u>Location</u>	<u>Symbol</u>
1 Departure Base	Identifier	MSN-NUM	ETD	Departure Base	15
2 Rendezvous Point	REND	MSN-NUM	---	Rendezvous Point	15
3 Pre-Refuel Point	Refuel Area ID	MSN-NUM	EST TIME	Pre-Refuel Control Point	4
4 Ingress Offset Point	Code	MSN-NUM	EST TIME	Offset Point Location	15
5 Ingress Point	Identifier	MSN-NUM	EST TIME	Ingress Point Location	15
6 Target/Request Point	Tgt/Req Num	MSN-NUM	EST TIME	Target/Request Location A	5/17
7 Egress Point	Code	MSN-NUM	EST TIME	Egress Point	15
8 Egress Offset Point	Code	MSN-NUM	EST TIME	Offset Point Location	15
9 Post Refuel	Refuel Area ID	MSN-NUM	EST TIME	Post Refuel Control Point	4
10 FAC Control Point	Callsign	MSN-NUM	EST TIME	FACP Control Point Location	11
11 Recovery Base	Identifier	MSN-NUM	ETR	Recovery Base	15

For Candidate RECCE Missions Schedule display of missions that are currently airborne at the time of the display request the first route point for display purposes is the current position of the mission. The data entered in the transfer file for current position for a Candidate RECCE Mission Schedule display contains the following data:

<u>Route Point Type</u>	<u>LABEL1</u>	<u>LABEL2</u>	<u>LABEL3</u>	<u>Location</u>	<u>Symbol</u>	<u>Remarks</u>
Current Position	MSN-NUM	PMNO	NO&TYPE A/C	Lat/Long	6	Current position is calculated by Candidate RECCE Mission Schedule Process.

All route points for Candidate RECCE Mission schedules, identification, location and estimated times are provided to the Candidate RECCE Mission Processor by the route generation processing function.

The Shoulder TAP message generated by the Candidate RECCE Mission Schedule process to initiate the transfer of mission schedule display data has the following format and content.

COMM CMSXX 01 X

<u>Message Field</u>	<u>Value</u>	<u>Remarks</u>
1 Processing Keyword Identifier	COMM	Identifies program that transfers Candidate RECCE Mission Schedule data to graphic processor.
2 Transfer File Identifier	CMSXX	XX is a number identifying the file and station for Candidate Fighter Mission Schedule data transfer.
3 Page Number	01	Identifies page one of the Transfer File.
4 Forced Display Indicator	X/U	X Display is forced to the station identified in this field. U The display is not forced. The transfer file for the 2nd Candidate Fighter Mission Schedule is not forced to the requesting station.

3.1.2.7.8.3.1.3.2.3 Information Processing

All data necessary to generate the graphic display of a Candidate RECCE Mission Schedule is provided by the Candidate RECCE Mission Schedule processor. For the candidates selected by this process for display all current position and route information is available from the route generation process. The data generated by this process is used to establish the necessary entries in the graphic data transfer file for the Candidate RECCE Mission Schedule display. A separate transfer file is to be prepared for each Candidate RECCE Schedule to be displayed.

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The display control properties for each object (route point) contained in a transfer are set to the values indicated in the following table.

Property	Value	Remarks
VECTOR	1	Set to 0 for last point on route
SIM	-	As specified for each type of route point
SO	0	Symbol orientation
SMAG	0	Symbol magnification
LPSIM	6	3x8 character label forced
TABFLAG	0	No tabular data specified

When the transfer files have been updated as required, the Shoulder TAP message necessary to initiate the transfer of data to the graphics processor is generated and sent. The graphics processor in turn requests the transfer Candidate RECCE Mission Schedule data and generates the display requested.

3.1.2.7.8.3.1.4 Mission Adjustment Display

As a result of mission adjustment processing new or adjusted missions shall be added to the Frag Order files of the Current Operations data. Whenever new or adjusted mission enters these frag order files the identification and route data associated with the mission is transferred to the graphic system data base and is available for display as a mission route at a graphic terminal. All mission adjustment operator actions DED cause the route data for the adjusted mission to be transferred to the graphic display system data base.

3.1.2.7.8.3.1.4.1 Source and Type of Inputs

The inputs required to transfer to the graphic display system route data, a new or adjusted mission is the identification of the new or adjusted mission. The format and content of the request message issued by mission adjustment processing for the transfer of mission route data to the graphics display system data base is:

ROUTE (Mission Number)

The Frag Order Mission Schedule file associated with the identified mission is also a necessary input to this process.

3.1.2.7.8.3.1.4.2 Destination and Type of Output

Two types of data outputs are required for the transfer of mission route data to the graphic system data base, 1) a graphic data transfer from the route file, and 2) a Shoulder TAP message. The storage of data in the route file is in the format and content indicated in the following table. For each mission route entered in this file Special Objects 1 and 2 are generated in addition to an object entry for each route point on the mission route.

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OBJECT	NAME LN MSN	LABEL LABEL1	LABEL2	LABEL3	LOC	SYMBOL	TAB1
1	S1 AA05				CORNER OF DISPLAY AREA	NO. OF OBJECTS	ROUTE
2	S2 AA05				CORNER OF DISPLAY AREA		
3	01 AA05	ROUTE PT IDENTIFIER	MISSION NUMBER	EST TIME TRK NO.	ROUTE PT. LOCATION	ROUTE PT SYMBOL	
N	ON AA05						

The following table indicates the type of information that the label and symbol properties contain for each of the possible type route points that may occur on a mission.

Route Point type are identified in column 1 of the table. For each type Label and Symbol data is specified.

MSN-NUM is the mission number as contained in the Frag file modified to 8 characters for graphic display.

ETD-ETOT-ETA-ETR indicate a 4 character estimated time value for the mission event. PMNO is the 4 character track number used to identify the PLRACTA air situation data provided for a mission. PMNO value is always position in character 5 thru 8 of Label 3. LABEL 3 data for Egress, Egress Offset and Post Refuel is not used to reduce over printing of data already displayed for three route points on the inbound to target position of the route.

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ROUTE POINT	LABEL1	LABEL 2	LABEL3	SYMBOL	REMARKS
Departure	BASE ID	MSN-NUM	ETD	15	ETD-1st 4 characters
RENDEZVOUS	(REND)	MSN-NUM	ETA PMNO	15	() Value display 5th-8th Character
PRE REFUEL	REFUEL AREA	MSN-NUM	ETA PMNO	4	
INGRESS OFFSET	CODE	MSN-NUM	ETA PMNO	15	
INGRESS	CODE	MSN-NUM	ETA PMNO	15	
CAP PT.	(CAP)	MSN-NUM	ETA PMNO	21	
ORBIT PT.	(ORBIT)	MSN-NUM	ETA PMNO	23	
FACP	CALL SIGN	MSN-NUM	ETA PMNO	11	1st 8 characters for C/S
TARGET	TGT-NUM	MSN-NUM	ETOT PMNO	5	
REQUEST-1	REQ-NUM-1	MSN-NUM	ETOT-1 PMNO	16 17	CAS Req RECCE Req
REQUEST-2	REQ-NUM-2	MSN-NUM	ETOT-2 PMNO	17	
REQUEST-3	REQ-NUM-3	MSN-NUM	ETOT-3 PMNO	17	
REQUEST-4	REQ-NUM-4	MSN-NUM	ETOT-4 PMNO	17	
EGRESS	CODE	MSN-NUM	-	15	
EGRESS OFFSET	CODE	MSN-NUM	-	15	
POST REFUEL	REFUEL AREA	MSN-NUM	-	4	
RECOVERY	BASE ID	MSN-NUM	ETR	15	5th-8th characters

The format and content of the Shoulder TAP message for the transfer of route data to the graphics system data base is:

COMM ROUTE 01 LLDD

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MESSAGE FIELD	VALUE	REMARKS
1 Processing keyword identifier	COMM	Identifies program that transfers Route data to the graphic processor.
2 Transfer file identifier	ROUTE	Identifies the file to be transferred.
3 Page No.	01	Identifies page one of the transfer file
4 Route identifier	LLDD	Route identifier assigned to mission. This value is equivalent PLRACTRA TRACK NUMBER.

3.1.2.7.8.3.1.4.3 Information Processing

Route data, point identification, time estimates and location are retrieved from the Frag Order file associated with the mission identified in the request message issued by the mission adjustment process. This route data is used to update the transfer file for the route and upon completion of the update the Shoulder TAP message is generated and sent to the graphic processor which in turn requests the transfer of the route data. The route data transfer is stored in the graphic system data base identified by the 4 character designator PMNO assigned to all missions.

3.1.2.7.8.3.2 Air Situation

The display of the current air situation at a graphic terminal is developed from information contained in two categories, PIA and T, of messages that are transmitted on the PLRACTA net. Category PIA messages are received from PLRACTA equipped aircraft and contain identification, position and status information associated with a single aircraft. Category T messages contain identification, position and status information on aircraft tracks detected and reported by Surveillance Sites. These messages are transmitted on the PLRACTA net every ten seconds for each track.

PLRACTA message data, real or simulated, are received and processed by the Track Data Buffer Computer - PDP8I. This computer serves as the interface between the PLRACTA system and TDSDT.

The Track Data Buffer computer provides the capability to identify and route messages received from the PLRACTA system to specific elements of the TDSDT. Included in this capability is the ability to receive, process, filter and route to the graphic display processor category PIA and T messages. The information presented in the air situation display at a graphic terminal originates in PLRACTA messages and is controlled for display purposes by processing filters which accept or reject specific messages based on content. This message filtering process is performed in the Track Data Buffer Computer. This process is controlled by a user station operator that has an associated graphic display capability. Message filter commands are entered by an operator in the Alphanumeric display system and sent to the PLRACTA Buffer Computer where filters are established and are used in the selecting of track data messages for display at a graphics terminal.

Data Entry Displays shall be provided for the entry of this filter command type data for the control of the air situation display.

Simulated PLRACTA message data is used to develop an air situation display at a Graphics display terminal. The operator requires the capability the control the display of air situation data associated with a specific mission contained in a frag order. The initial capability provided for this positive control of the PLRACTA message data being passed to the graphics terminal for the air situation display is an addition filter control command to stop the passing of PLA or T message from a specific source. The entry of this command with the identification of a specific PLRACTA mission number causes all messages received from the identified source to be rejected by the Track Data Buffer Computer and to not appear on the air situation display at any of the graphic terminals.

3.1.2.7.8.3.2.1 Source and Type of Inputs

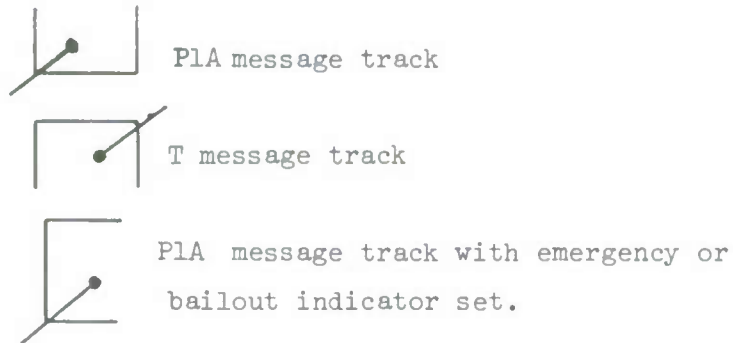
Inputs required for the display of air situation data at a graphics terminal are the following categories of PLRACTA messages.

- a) PLA
- b) T

In addition to these categories of PLRACTA message, filter command inputs from the user station permit an operator to selectively filter track message information.

3.1.2.7.8.3.2.2 Destination and Type of Outputs

All PLA and T messages that meet the filter criteria established by the operator for his air situation display are passed to the graphic processor in binary format and are converted for display by this processor. The following information displays are used to define track positions in the air.



A single 8 character label is available by lightpen request that identifies each track. For PLA messages the format of this label is LLDD. For T messages the format is LDDD.

3.1.2.7.8.3.2.3 Information Processing

The information contained in the PLRACTA messages received and processed by the Track Data Buffer Computer are transferred to the graphic data processor and displayed if they meet the filter criteria specified.

3.1.2.7.8.3.3 Background Displays

Background displays are those graphic display overlays that contain relatively static information related to geography, boundaries, civilian and military elements, and environmental conditions that can be graphically displayed. The following table identifies each graphic display Background Overlay defined for the Current Operations graphic display capability. This table contains the name of the overlay, the name file used to store and transfer the overlay to the graphic system data base, the number of objects in each overlay file and the setting values for control properties for each object contained in the file.

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OVERLAY TITLE	GRAPHICS FILE NAME	NO OF OBJECTS	SYMBOL (SIM)	SYMBOL ORIENTATION (SO)	SYMBOL MAGNIFICATION (SMAG)	LABEL MATRIX (LPSIM)	VECTOR
Coast Line	COAST	10	1	0	0	0	1
Boundaries	BOUND	10	1	0	0	0	1
Cities	CITIES	15	14	0	0	1	0
Landmarks	LNDMK	25		0	0	1	0
FEBA	FEBA	10	1	0	0	0	1
Enemy Air Base	EAB	10		0	0	5	0
Enemy Missile Unit	EMU	15	7	0	0	5	0
Enemy Electronic Order of Battle	EEOB	10	22	0	0	5	0
Enemy Ground Order of Battle	EOGB	10	24	0	0	1	0
Friendly Hdqtrs	FHDQ	5	25	0	0	5	0
Air Force Units	AFU	50		0	0	5	0
Ground Forces	GFS	20	20	0	0	5	0
ADA	ADA	10	7	0	0	5	0
Tactical Air Control Party	TACP	20	11	0	0	5	0
Naval Forces	NAV	10	27	0	0	5	0
Search and Rescue Station	SARSTA	5	30	0	0	5	0
Refueling Areas	REFA	5	4	0	0	3	0
Electronic Warfare Stations	EWS	5	23	0	0	3	0
Combat Air Patrol Stations	CAP	5	21	0	0	3	0
Weather Points	WXP	25	26	0	0	5	0
Hot Area	HOTS	10	13	0	0	1	0
Route Points	RPTS	35	15	0	0	1	0

For each overlay defined a file has been established in the Current Operations data base. This file is in the standard format required for the graphic display system. The contents of label display associated with each of the established overlays.

3.1.2.7.8.3.3.1 Source and Type of Inputs

Overlay data files are transferred to the graphics system data base during system initialization. The

COMM INITIALIZE ADAGE FILES

statement when input by a user station operator rouses the overlay files to be transferred.

3.1.2.7.8.3.3.2 Destination and Type of Outputs

The overlay data files are transferred and stored in the graphic system data base. The data in these is available for display at the graphics terminal by selection of the file name by lightpen action from the variable selection sub lists presented in Area C of the graphic display surface when OVERLAY is selected from the Permanent Mode Selection list presented in Area B.

3.1.2.7.8.3.3.3 Information Processing

During the system initialization process each overlay file is transferred to the graphic system data base. A list of all overlay files to be transferred is maintained by the process.

Each of the overlay files identified in the list is transferred, five objects at a time, by the process in response to transfer requests received from the graphic processor. When the transfer of a file is complete, the transfer process issues a Shoulder TAP message for the transfer of the next file identified in the list. When all identified files have been transferred, the overlay displays for the graphic display system are available in the graphic data base.

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	LABEL 1	LABEL 2	LABEL 3
COAST LINE	None	None	None
BOUNDARIES	None	None	None
CITIES	NAME	None	None
LANDMARKS	NAME	None	None
FEBA	None	None	None
ENEMY AIRBASE	BASENAME		
ENEMY MISSILE UNIT	SITE IDENTIFIER	TYPE MISSILE	None
ENEMY ELECTRONIC	SITE IDENTIFIER	EW	GCI
ORDER OF BATTLE			
ENEMY GROUND ORDER OF BATTLE	UNIT IDENTIFIER	None	None
FRIENDLY HEADQUARTERS	AGENCY	CALLSIGN	None
AIR FORCE UNITS	AGENCY/UNIT	CALLSIGN	Location Identifier
GROUND FORCES	AGENCY	CALLSIGN	TYPE
ADA	ELEMENT ID	BATTERY	CALLSIGN
TACTICAL AIR-CONTROL PARTY	UNIT	BRIGADE	CALLSIGN
NAVAL FORCE	UNIT	CALLSIGN	TYPE
SEARCH AND RESCUE STATION	IDENTIFIER	CALLSIGN	A/C No. & Type
REFUELING AREAS	IDENTIFIER	CALLSIGN	None
ELECTRONIC WARFARE STATION	IDENTIFIER	CALLSIGN	None
COMBAT AIR PATROL STATIONS	CAP	CALLSIGN	None
WEATHER POINTS	IDENTIFIER	Ceiling/Visibility	Weather
HOT AREA	IDENTIFIER	None	None
ROUTE POINTS	IDENTIFIER	None	None

3.1.2.7.8.3.4 Additional Requirements

3.1.2.7.8.3.4.1 PLRACTA Mission Number

To provide a common method of identifying both PLRACTA originated air situation tracks and Frag Order missions a Property PMNO has been added to all Frag Order Mission Schedule files. This property, PLRACTA Mission Number is used to assign to a mission a special mission number that can be assigned to and reported by PLRACTA equipped aircraft. This number can be assigned to all missions occurring in the Current Operations data base. The format of this PLRACTA mission number is LLDD where the letter values represent the PLRACTA unit identifier assigned to each unit and the digit portion is the sequence number assigned to the mission by the planning actions. Each of the mission adjustment functions;

Fighter Planning Adjustment

RECCE Planning Adjustment

Support Mission Planning

are to be modified to, when establishing a new mission entry in the appropriate Frag Order/Mission Schedule File, create a PLRACTA mission number for the entry. The two letter unit identifier contained in the Unit Planning file for the assigned unit is combined with the Callsign Sequence Number of mission for which the new Frag Order entry is being accomplished. This Unit Identifier and Sequence Number makes up the PLRACTA mission number assigned to the new mission.

This number can be anticipated for exercise or demonstration purposes and can be assigned to simulated air situation PLRACTA messages.

The PLRACTA Mission Number property has been added to the following Current Operations data base files:

- a. Preplanned Fighter Frag Order/Mission Schedule
- b. Preplanned Reconnaissance Frag Order/Mission Schedule
- c. Electronic Warfare Frag Order/Mission Schedule
- d. Immediate Close Air Support Mission Schedule
- e. Immediate Reconnaissance Mission Schedule
- f. Search and Rescue Frag Order/Mission Schedule

The format and content of the property in each of these files is exactly the same.

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<u>PROPERTY</u> <u>NAME</u>	<u>PROPERTY</u> <u>TYPE</u>	<u>EBCDIC</u> <u>FIELD SIZE</u>	<u>RANGE/</u> <u>VALUE</u>	<u>REMARKS/</u> <u>DESCRIPTION</u>
PMNO	L	4	LLDD	PLRACTA Mission Number

The Unit Planning file has been modified by the addition of the following property

<u>PROPERTY</u> <u>NAME</u>	<u>PROPERTY</u> <u>TYPE</u>	<u>EBCDIC</u> <u>FIELD SIZE</u>	<u>RANGE/</u> <u>VALUE</u>	<u>REMARKS/</u> <u>DESCRIPTION</u>
PUID	L	2	AA- 00	Unit Identifier assigned to PLRACTA units

For the Current Operations Units the following identifiers have been assigned.

<u>PLRACTA UNIT ID</u>	<u>CURRENT OPS UNIT</u>
AA	110
AB	111
AC	112
AD	113
BA	121
BB	122
BC	123
BD	124
CA	555
DA	049

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3.1.2.7.8.3.4.2 Air Situation Filter

In addition to the Filter Commands that are currently available in the GFE Software an additional filter command is required to stop the processing of PLRACTA messages related to a specific mission.

This command permits the user station operator to have the Track Data Buffer Computer stop processing all messages with a specific PLRACTA Unit Identifier (2 letter code) and daily sequence number. These values are combined to make up the PLRACTA Mission Number for missions appearing in the Current Operations Frag Order.

The data entry display (DED for this Filter Command has the following format:

DON'T PASS LLDD	(for PLA message)
DON'T PASS LDDD	(for T message)

This DED is to be processed by CLASSIC at the user station and routed to the Track Data Buffer Computer where a filter will reject from processing all PLA messages that have LLDD as a PLRACTA Mission Number.

A modification of this DED for controlling T messages assigned to a specific track is also available.

3.1.2.7.8.3.4.3 Initialization of Graphic Data Base

All graphic display information with the exception of Air Situation and Mission Adjustment data is contained in the graphic system data base. This data base for Current Operations contains the following files. Each of these files is available as a separate overlay at a graphics display station.

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FILE DESCRIPTION

FILE NAME

COASTLINE	COAST
BOUNDARIES	BOUND
CITIES	CITIES
LANDMARKS	LNDMK
FEBA	FEBA
ENEMY AIRBASES	EAB
ENEMY MISSILE UNITS	EMU
ENEMY ELECTRONIC ORDER OF BATTLE	EEOB
ENEMY GROUND ORDER OF BATTLE	EGOB
FRIENDLY HEADQUARTERS	FHDQ
AIR FORCE UNITS	AFU
GROUND FORCES	GFS
ADA	ADA
TACTICAL AIR CONTROL PARTIES	TACP
NAVAL FORCES	NAV
SEARCH AND RESCUE STATION	SARSTA
REFUELING AREA	REFA
ELECTRONIC WARFARE STATIONS	EWS
COMPAT AIR PATROL STATIONS	CAP
WEATHER POINTS	WXP
HOT AREAS	HOTS
ROUTE POINTS	RPTS

The data contained in these files is semi-fixed or static in nature. A file of data is contained in the Current Operations data base for each of the overlay files indicated in the graphic data base. At the time the TDSDT system is initialized for Current Operations it is necessary to transfer these files to the graphic system data base. This process is initiated by a user station operator when he enters at the alphanumeric display terminal the following message:

COMM INITIALIZE ADAGE FILES

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This message causes the file transfer program to issue the required Shoulder Tap message to the graphic processor and when requested by this processor transfer complete contents of each of the files listed above to the graphic system data base. Each of the above listed files has been generated in standard transfer file format and is maintained in the Current Operations Data Base. In addition to the transfer of the static information contained in these files, mission route data is also required to be available in the graphic system data base. During the initialization process route data is extracted from the following Frag Order Mission Schedule files and stored in proper format in a transfer file and sent to the graphic system data base. The files from which route data are retrieved are:

- Preplanned Fighter Frag Order/Mission Schedule
- Preplanned Reconnaissance Frag Order/Mission Schedule
- Immediate Close Air Support Mission Schedule
- Immediate Air Reconnaissance Mission Schedule
- Electronic Warfare Frag Order/Mission Schedule

The route of each mission contained in these files is converted to the standard transfer file format, assigned a route identifier and transferred to the graphics system data base. All route data is stored in a single file, the Route File, in the graphics data base. The route identifier assigned to a route is the PLRACTA Mission Number that has been assigned to the mission for which the route has been generated. This identifier is used to retrieve the route from the graphic system data base route file.

The format and content of the Route Data transfer file are defined in Section 3.1.7.2. Route file entries are not generated for: 1) Escort missions contained in the Preplanned Fighter Frag Order File or 2) EW missions which escort a fighter or RECCE mission.

3.1.3.9 (Cont'd) FILE NAME: Electronic Warfare Frag Order/Mission Schedule

SHORT TITLE:

OBJECT:

MAXIMUM NUMBER OF OBJECTS:

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PROPERTY NUMBER		PROPERTY NAME		PROPERTY TYPE		ERCDIC FIELD SIZE		COMPLEX PROPERTY INDICATOR		SLAVE PROPERTY START LOCATION		RANGE/VALUE		REMARKS/DESCRIPTION	
94	DATE-14	L	5	S	1										
95	TIME-14	L	4	S	7										
96	POST-FUEL	I	5												Actual post strike fuel unloaded in pounds
97	ETR	L	10	M											Estimated time of return
98	DATE-15	L	5	S	1										
99	TIME-15	L	4	S	7										
100	ATR	L	10	M											Actual time of return
101	DATE-16	L	5	S	1										
102	TIME-16	L	4	S	7										
103	A/C-NO-RET	I	2												Number of aircraft that did not return
104	NO-RET-C/S	L	18												Call sign of aircraft not returned. Ex: GUMSHOE 04
105	REA-NO-RET	L	15												Reason aircraft did not return, if known
106	LOC-DOWN	L	12												Location down, if known
107	MSN-RESULT	L	25												Mission results. Ex: SUCCESSFUL, UNSUCCESSFUL, etc.
108	REMARKS-2	T	58												Any amplifying data
109	OFFSET-IN-CD	L	3												Offset Point-Ingress Code. Ex: AAO, BBO
110	INGRESS-CD	L	2												Ingress Point Code EX:AA,BB
111	EGRESS-CD	L	2												Egress Point Code EX:WA,WB
112	OFFSET-EG-CD	L	3												Offset Point-Egress Code. EX:WAO,WBO
113	BLANK	L	2												To facilitate programming

3.1.3.9 (Cont'd) FILE NAME: Electronic Warfare Frag Order/Mission Schedule

SHORT TITLE:

OBJECT:

MAXIMUM NUMBER OF OBJECTS:

PAGE 7 OF 7

PROPERTY NUMBER		PROPERTY NAME		PROPERTY TYPE		EBCDIC FIELD SIZE		COMPLEX PROPERTY INDICATOR		SLAVE PROPERTY START LOCATION		RANGE/VALUE		REMARKS/DESCRIPTION	
114	PRE-FUEL-AT	L	10	M	1	7								Prestrike refueling time - Actual	
115	DATE-17	L	5	S											
116	TIME-17	L	4	S											
117	POST-FUEL-AT	L	10	M	1	7								Poststrike refueling time - Actual	
118	DATE-18	L	5	S											
119	TIME-18	L	4	S											
120	PMNO	L	4											PLRACTA Mission Number	

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3.1.3.12 (Cont'd) FILE NAME: Immediate Close Air Support Mission Schedule

SHORT TITLE:

PAGE 4 OF 4

MAXIMUM NUMBER OF OBJECTS:

OBJECT:

PROPERTY NUMBER		PROPERTY NAME		PROPERTY TYPE		EBCDIC FIELD SIZE		COMPLEX PROPERTY INDICATOR		SLAVE PROPERTY START LOCATION		RANGE/VALUE		REMARKS/DESCRIPTION	
53	LOC-DOWN	L	12											Location of downed aircraft (lat/long)	
54	MEN-RESULT	L	25											Mission results. Ex: SUCCESSFUL, UNSUCCESSFUL, ALL ORDNANCE ON TARGET.	
55	REMARKS	T	58											Any amplifying data	
56	STATUS	L	1											A-Active (T.O. Report Received), C-Complete (Land Report Received),	
57	BLANK	L	2											D-Deleted	
58	DEF-BASE	L	4											To facilitate programming	
59	RECOV-BASE	L	4											Departure Base	
60	PMNO	L	4											Recovery Base	
														PIRACTA Mission Number	

3.1.3.14 (Cont'd) FILE NAME: Immediate Reconnaissance Mission Schedule

SHORT TITLE:

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MAXIMUM NUMBER OF OBJECTS:

OBJECT:

PROPERTY NUMBER	PROPERTY NAME	PROPERTY TYPE	EBCDIC FIELD SIZE			RANGE/VALUE		REMARKS/DESCRIPTION
			COMPLEX	PROPERTY INDICATOR	SLAVE PROPERTY START LOCATION			
34	DATE-4	L	5	S	1	Location of aborted aircraft. Base designator Abort reason Estimated time on target		
35	TIME-4	L	4	S	7			
36	ABORT-LOC	L	4					
37	ABORT-REA	L	5			Actual time on target		
38	ETOT	L	10	M				
39	DATE-5	L	5	S	1			
40	TIME-5	L	4	S	7	Estimated time of return		
41	ATOT	L	10	M				
42	DATE-6	L	5	S	1			
43	TIME-6	L	4	S	7	Actual time of return		
44	ETR	L	10	M				
45	DATE-7	L	5	S	1			
46	TIME-7	L	4	S	7	Number of aircraft not returned Call sign of aircraft not returned Reason aircraft did not return Location of downed aircraft (lat/long)		
47	ATR	L	10	M				
48	DATE-8	L	5	S	1			
49	TIME-8	L	4	S	7			
50	A/C-NO-RET	I	2					
51	NO-RET-C/S	L	18					
52	REA-NO-RET	L	15					
53	LOC-DOWN	L	12					

3.1.3.14 (Cont'd) FILE NAME: Immediate Reconnaissance Mission Schedule

SHORT TITLE:

OBJECT:

MAXIMUM NUMBER OF OBJECTS:

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PROPERTY NUMBER	PROPERTY NAME	PROPERTY TYPE	EBCDIC FIELD SIZE	COMPLEX PROPERTY INDICATOR	SLAVE PROPERTY START LOCATION	RANGE/VALUE	REMARKS/DESCRIPTION
54	IN-REP-IND	L	1				Enter 'X' if inflight report is required
55	IN-REP-REQ	L	10	M			Time requestor received inflight report
56	DATE-9	L	5	S	1		
57	TIME-9	L	4	S	7		
58	PI-REQ	L	1				Enter "X" if photo interpreter report is required
59	PI-REQ-TI	L	10	M			Time requestor received PI report
60	DATE-10	L	5	S	1		
61	TIME-10	L	4	S	7		
62	PROD-DEL-TI	L	10	M			Product delivery time
63	DATE-11	L	5	S	1		
64	TIME-11	L	4	S	7		
65	REMARKS	T	58				Any amplifying data
66	STATUS	L	1		A,C,D		A-Active (T.O. Report Received), C-Complete (Land Report Received), D-Deleted
67	BLANK	L	2				To facilitate programming
68	DEP-BASE	L	4				Departure Base
69	RECOV-BASE	L	4				Recovery Base
70	PMNO	L	4		L1DD		PIRACTA Mission Number

3.1.3.22 (Cont'd) FILE NAME: Preplanned Fighter Frag Order/Mission Schedule

SHORT TITLE:

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MAXIMUM NUMBER OF OBJECTS:

OBJECT:

PROPERTY NUMBER		PROPERTY NAME		PROPERTY TYPE		EBCDIC FIELD SIZE		COMPLEX PROPERTY INDICATOR		SLAVE PROPERTY START LOCATION		RANGE/VALUE		REMARKS/DESCRIPTION	
114	DATE-15	L	5	S	1									Actual post strike refuel unloaded in pounds	
115	TIME-15	L	4	S	7									NOTE: Change description of property: POST-FUEL-MS	
116	POST-FUEL	I	5											Estimated time of return	
117	ETR	L	10	M										Actual time of return	
118	DATE-16	L	5	S	1										
119	TIME-16	L	4	S	7										
120	ATR	L	10	M											
121	DATE-17	L	5	S	1										
122	TIME-17	L	4	S	7										
123	A/C-NO-RET	I	2											Number of aircraft not returned	
124	NO-RET-C/S	L	18											Call sign of aircraft not returned. Ex: SABRE01, 02	
125	REA-NO-RET	L	15											Reason aircraft did not return. Ex: AAA, GROUND FIRE, MIG	
126	LOC-DOWN	L	12											Location of downed aircraft, lat/long	
127	MSN-RESULT	L	25											Mission results. Ex: SUCCESSFUL, UNSUCCESSFUL, ALL ORDNANCE ON TARGET, etc.	
128	REMARKS-2	T	55											Any amplifying data	
129	MSN-DELETE D	L	12											Mission number of the frag entry that was deleted to develop this frag entry	

3.1.3.22 (Cont.) FILE NAME: Preplanned Fighter Frag Order/Mission Schedule

SHORT TITLE:

OBJECT:

MAXIMUM NUMBER OF OBJECTS:

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PROPERTY NUMBER	PROPERTY NAME	PROPERTY TYPE	EBCDIC FIELD SIZE	COMPLEX PROPERTY INDICATOR	SLAVE PROPERTY START LOCATION	RANGE/VALUE	REMARKS/DESCRIPTION
130	OFFSET-IN-CD	L	3				Offset Point - Ingress Code EX: ARD, BBO
131	INGRESS-CD	L	2				Ingress Point Code EX: AA, BB
132	EGRESS-CD	L	2				Egress Point Code EX: WA, WB
133	OFFSET-EG-CD	L	3				Offset Point - Egress Code EX: WAD, WBO
134	BLANK	L	2				To facilitate Programming
135	PRE-FUEL-AT	L	10	M			Prestrike refueling time - Actual
136	DATE-18	L	5	S	1		
137	TIME-18	L	4	S	7		
138	POST-FUEL-AT	L	10	M			Poststrike refueling time - Actual
139	DATE-19	L	5	S	1		
140	TIME-19	L	4	S	7		
141	PMNO	L	4				PIRACTA Mission Number
					LDD		

3.1.3.23 (Cont'd) FILE NAME: Preplanned Reconnaissance Frag Order/Mission Schedule

SHORT TITLE:

OBJECT:

MAXIMUM NUMBER OF OBJECTS:

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PROPERTY NUMBER	PROPERTY NAME	PROPERTY TYPE	EBDC FIELD SIZE	COMPLEX PROPERTY INDICATOR	SLAVE PROPERTY START LOCATION	RANGE/VALUE	REMARKS/DESCRIPTION
201	ATOT-3	L	10	M			Actual time on third target
202	DATE-28	L	5	S	1		
203	TIME-28	L	4	S	7		Estimated time on fourth target
204	ETOT-4	L	10	M			
205	DATE-29	L	5	S	1		
206	TIME-29	L	4	S	7		Actual time on fourth target
207	ATOT-4	L	10	M			
208	DATE-30	L	5	S	1		
209	TIME-30	L	4	S	7		Actual post strike fuel unloaded in pounds
210	POST-FUEL	I	5				Estimated time of return
211	ETR	L	10	M			
212	DATE-31	L	5	S	1		
213	TIME-31	L	4	S	7		Actual time of return
214	ATR	L	10	M			
215	DATE-32	L	5	S	1		
216	TIME-32	L	4	S	7		Number of aircraft not returned
217	A/C-NO-RET	I	2				Call sign of aircraft not returned. EX: SABRE01,02
218	NO-RET-C/S	L	18				Reason aircraft did not return. EX: AA, GROUND FIRE
219	REA-NO-RET	L	15				Location of Downed aircraft (lat/long)
220	LOC-DOWN	L	12				

3.1.3.23 (Cont'd) FILE NAME: Preplanned Reconnaissance Frag Order/Mission Schedule

SHORT TITLE:

OBJECT:

MAXIMUM NUMBER OF OBJECTS:

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PROPERTY NUMBER		PROPERTY NAME		PROPERTY TYPE		EBCDIC FIELD SIZE		COMPLEX PROPERTY INDICATOR		SLAVE PROPERTY START LOCATION		RANGE/VALUE		REMARKS/DESCRIPTION	
221	REMARKS-2	T	58											Any amplifying data	
222	MSN-DELETED	L	12											Mission number of frag entry deleted to develop this frag entry	
223	NUM-REQ	I	1											Total number of requests assigned to this mission.	
224	OFFSET-IN-CD	L	3											Offset Point - Ingress Code EX: AAD,BBO	
225	INGRESS-CD	L	2											Ingress Point Code EX: AA, BB	
226	EGRESS-CD	L	2											Egress Point Code EX: WA, WB	
227	OFFSET-EG-CD	L	3											Offset Point - Ingress Code EX: WAD,WBO	
228	BLANK	L	2											To facilitate programming	
229	PRE-FUEL-AT	L	10			M								Prestrike refueling time - Actual	
230	DATE-33	L	5			S		1							
231	TIME-33	L	4			S		7							
232	POST-FUEL-AT	L	10			M								Poststrike refueling time - Actual	
233	DATE-34	L	5			S		1							
234	TIME-34	L	4			S		7							
235	PMNO	L	4											PLRACTA Mission Number	

3.1.3.41 FILE NAME: Unit Planning
SHORT TITLE:
OBJECT:

MAXIMUM NUMBER OF OBJECTS: PAGE 2 OF 2

PROPERTY NUMBER	PROPERTY NAME	PROPERTY TYPE	EBCDIC FIELD SIZE	COMPLEX PROPERTY INDICATOR	SLAVE PROPERTY START LOCATION	RANGE/VALUE	REMARKS/DESCRIPTION
16	HOME-BASE	L	4				Enter 4 letter station identifier
17	HOME-BASE-CO	L	12				Home Base Coordinates
18	DISP-BASE	L	4				Enter 4 letter station identifier for dispersal base
19	DISP-BASE-CO	L	12				Dispersal Base Coordinates
20	A/C-TYPE-1	L	6				Enter Type, Model and Series-Home Base
21	SORT-AVAL-1	I	3		+ OR - 00 to 99		Enter Sorties available for aircraft type in prop. 19
22	SORT-COMM-1	I	2				Enter Sorties committed for aircraft type in prop. 19
23	A/C-TYPE-2	L	6				Enter type, model and series-Home Base
24	SORT-AVAL-2	I	3		+ OR - 00 to 99		Enter Sorties available for aircraft in prop. 22
25	SORT-COMM-2	I	2				Enter Sorties committed for aircraft in prop. 22
26	D-A/C-TYPE-1	L	6				Dispersed aircraft, type, model and series
27	D-SOR-AVAL-1	I	3		+ OR - 00 to 99		Dispersed sorties available for aircraft in prop. 25
28	D-SOR-COMM-1	I	2				Dispersed sorties committed for aircraft in prop. 25
29	D-A/C-TYPE-2	L	6				Dispersed aircraft (Different type). Type, Model and Series
30	D-SOR-AVAL-2	I	3		+ OR - 00 to 99		Dispersed sorties available for aircraft in prop. 28
31	D-SOR-COMM-2	I	2				Dispersed sorties committed for aircraft in prop 28
32	FUID	L	2		AA-00		PLRACTA Unit Identifier

3.1.3.42		FILE NAME: Working Simulation		MAXIMUM NUMBER OF OBJECTS: 800		PAGE 1 OF 1		
SHORT TITLE: WORKSIM		OBJECT: TIME						
PROPERTY NUMBER	PROPERTY NAME	PROPERTY TYPE		RANGE/VALUE		REMARKS/DESCRIPTION		
		EBDIC FIELD SIZE	COMPLEX PROPERTY INDICATOR	SLAVE PROPERTY START LOCATION				
1	NAME	L 8	M	DDD/DDDD				
2	DAY	L 4	S	1				
3	TIME	L 4	S	5				
4	IN-MSG	T 550	M					
5	SOURCE	T 15	S	1				
6	MSG-TYPE	T 4	S	17				
7	MSG-DATA	T 529	S	22				
						Julian Day. EX: 252 / EX: 0800 Text of message EX: DASC, 110TUOC, etc. EX: REFR, ABTR, TAUS, TKOR, etc.		

4.0 QUALITY ASSURANCE PROVISIONS

This section identifies the quality assurance provisions to be applied in the development of functional software. This section identifies the testing to be performed as specified in the Statement of Work.

4.1 COMPUTER PROGRAMMING TEST AND EVALUATION

Computer program testing will be performed to verify that the functional software satisfies the design requirements stated in section 3.0, Requirements, of this specification and also to assure that it provides the necessary capabilities to support the operational demonstration as specified in TM-LX-346/800/01 the Category I Test Plan/Procedures for TACC Functional Software.

4.1.1 Test Methodology

Testing will be performed in three related steps:

- . Testing of individual program modules
- . Testing sets of program modules
- . System testing of the integrated computer program package.

In performing the testing the following requirements will be identified:

- . the test environment (hardware and software resources required)
- . the range of conditions and data values required to exercise the individual program module or modules
- . the test techniques to be employed
- . the test results expected.

4.1.2 Test Performance

Individual program modules will be tested using simulated inputs. Outputs from the program modules will be compared with predicted outputs. This technique will be repeated for program modules tested together in sets. The test techniques and data required to achieve system test objectives will be done prior to integration testing to provide an efficient transition to the operational demonstration.

4.2 OPERATIONAL DEMONSTRATION

The operational demonstration of TDSDT functional software will demonstrate the specific functional programs produced and will evaluate the capability of these programs to support the operational requirements imposed on a TACC in a realistic tactical situation. The approved Part I Performance Design Requirements for TACC Functional Software will be used as the baseline for available software. A scenario reflecting a medium tactical force situation will be generated to provide the general tactical situation and operational criteria will be established for the operational functions of a TACC. The Category I Test Plan/Procedures for TACC Functional Software as documented in TM-LX-346/800/01 will describe the plans and procedures for conducting the operational demonstration.

4.3 GRAPHICS SYSTEM TESTING

This section identifies test requirements for graphic display capability of the TDSDT Current Operations capability. The following table identifies the graphic display capabilities and indicates the type of information generation and transfer to be tested to insure the graphic display capability meets specified requirements contained in Section 3.0 of this document.

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Capability	Shoulder Tap	Transfer File	Graphic Data Base	Forced Display Requirement
1. Candidate Target Requirements	Yes	Yes (CRAL-3)	Yes	Yes
2. Candidate RECCE Requirements	Yes	Yes (CRAL-3)	Yes	Yes
3. Candidate CAS Requirements	Yes	Yes (CRAL-3)	Yes	Yes
4. Candidate Mission	Yes	Yes		
A. Fighter	Yes	(CMAL-3)	Yes	Yes
B. RECCE	Yes	(CMAL-3)	Yes	Yes
5. Candidate Mission Sched.		Yes		
A. Fighter	Yes	(CMS11-32)	Yes	Yes
B. RECCE	Yes	(CMS11-32)	Yes	Yes
6. SAR Requirements	Yes	SARR	Yes	No
7. Mission Adjustment		Yes		
A. Fighter	No	ROUTE	Yes	No
B. RECCE	No	ROUTE	Yes	No
C. Support	No	ROUTE	Yes	No
8. Air Situation				
A. Simulated Messages	No	No	No	Yes
B. Filter Commands	No	No	No	No
9. Initialization				
A. Background	Yes	Yes	Yes	No
B. Routes	Yes	Yes	Yes	No