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Theater Battle Management (TBM)  
Human Computer Interaction (HCI)  
Specification

MP 94B0000036

May 1994

C. D. Bowen

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# Theater Battle Management (TBM) Human Computer Interaction (HCI) Specification

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C. D. Bowen

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## ABSTRACT

This document provides a standard for those characteristics of the human computer interface (HCI) that must be consistent to permit users to use Theater Battle Management (TBM) systems with minimum distractions and training. It includes both design guidance and a framework for the HCI design rule development process. The HCI specifications will be continually updated as the TBM system development progresses.

The first phase of the TBM HCI Specification development task was to select appropriate human computer interaction design guidelines and rules. The majority of the design rules were drawn from the Department of Defense (DOD) HCI Style Guide, Addendum 1, since this has been adopted as a standard (User Interface Specifications for the Joint Maritime Command Information System (JMCIS)) and the Air Force Standard System Center Graphical User Interface (GUI) Standards. These documents were also supplemented with a variety of existing guidance on HCI from both the military and commercial worlds.

The second phase of the TBM HCI Specification development task was to identify any differences between the User Interface Specifications for the JMCIS and the Standard System Center Standards. These differences were then resolved and incorporated into the TBM HCI Specification.

The third phase on the TBM HCI Specification development task defined TBM-specific user interface design rules. These rules address topics such as tabular lists, map symbology, command action icons, and TBM data element terminology and abbreviations. The TBM HCI Specification has also expanded on the source documents by providing what are termed "Developer Notes". These "Notes" are intended to provide more specific guidance to user interface developers on how the design rules specified in TBM HCI Specification can be achieved.

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I would like to acknowledge the efforts of Janet Blackwell and Ron Conti in the compilation of the TBM HCI Specification. They provided useful insight on how to use the Motif™ window manager and the Motif™ widget set to implement a consistent HCI for TBM. Additionally, Janet Blackwell provided some of the screen diagrams used in the TBM HCI Specification and helped define some of the task-specific windows included in this document.

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# SECTION 1

## INTRODUCTION

This document provides a standard for those characteristics of the human computer interface (HCI) that must be consistent to permit users to use the Theater Battle Management (TBM) system with minimum interference. It includes both design guidance and a framework for the HCI design rule development process and library items.

### 1.1 GENERAL INFORMATION

The HCI deals with the aspects of a system's design that influences a user's participation in information handling tasks. The HCI is defined in terms of both the tangible and the intangible aspects of the system software. The tangible aspects include screen designs, menus, error messages, etc.; while the intangible aspects include the sequence control and the program logic of the system software. Good HCI designs incorporate needed user functionality, are easy to learn, and improve user performance. Conversely, poor HCI designs confuse cosmetic features with requirements, are difficult to use, increase user errors, and reduce user performance.

The user interface designer has a variety of technologies available for the design of a system's HCI. The challenge is to incorporate these usable technologies into a HCI design that integrates the user with the system and facilitates effective human performance.

#### 1.1.1 HCI Design Rule Development

HCI guidelines are generally stated recommendations which are based on generally accepted practices or human performance data. Guidelines should be used by HCI designers as a resource for the development of design rules, and only specifically worded design rules should be imposed as a contractual design standard (Smith, 1986).

The definition of a human computer using HCI guidelines involves a number of steps. Designers should first identify the guidelines which are applicable to the proposed system. Not all guidelines are applicable to a HCI. Some guidelines may conflict and it is the designer's job to choose the more important guidelines. Further, budgetary and time restrictions may force a designer to apply only the most important guidelines. The appropriate design guidelines are selected from a number of sources. Smith and Mosier (1986) provide a number of general guidelines for software development and the DOD has recently compiled a HCI Style Guide. Likewise, commercial guidelines such as the Motif™ Style Guide are also available.

Once appropriate design guidelines are identified, they must be translated into specific design rules. Because guidelines are intended for use on a variety of systems, they are worded in general terms. Some guidelines can have different possible implementations. It is the designer's job to specify explicit design rules. For example, a HCI guideline may require that all display titles be placed in a consistent location. A HCI design rule would specify that each display title is centered at the top of each display in a ten-point mixed-case bolded helvetica font. The step of translating HCI guidelines into HCI rules is crucial if the HCI is to be tangible. If this is not done and coordinated with all developers, each developer will create design rules

individually. The result is an inconsistent design that may or may not be corrected through numerous iterations of reviewing displays. Not only is this approach time consuming and frustrating, it is rarely systematic.

Translating a design guideline into a specific design rule can be a difficult process. A number of tradeoffs must be addressed. Tradeoff decisions are made based on the operational situation, the skills of the users, and the mission or tasks to be accomplished by the users. What is needed is a design methodology which examines these variables.

### **1.1.2 HCI Style Guides and HCI Specifications**

Dumas (1988) has described the need for a HCI document for every prototyping or operational software development effort. The HCI handbook or application-specific style guide provides a means for members of the software development team to understand the practices that should be followed to create an effective and consistent software product. Larger software efforts that require many software developers have the greatest need for a HCI style guide. However, even small software efforts can benefit from such a guide.

Ensuring HCI consistency within a prototype and, subsequently, a software product is the principal role of an HCI style guide. As the prototype is rapidly assembled, consistency within a single software engineer's techniques for presenting the HCI can be a problem. Establishing consistency among numerous software engineers is far more challenging.

The contents of a HCI style guide will differ for every application and a style guide will evolve throughout the design process. At the onset of the design process, a style guide will contain a collection of applicable HCI guidelines. These guidelines are often derived from guidelines that govern hardware and software choices (e.g., OSF/MOTIF™ Style Guide, Apple Style Guide, IBM's Common User Access, etc.). Guidelines are also derived from more general collections of software HCI guidelines such as the Guidelines for Designing HCI Software (Smith and Mosier, 1986). As the design process proceeds on a specific application, the USI style guide becomes more specific. At the conclusion of the design process, the style guide becomes a HCI design specification. The HCI design specification defines the HCI design in every detail. All applicable design guidelines have been translated into design rules and every aspect of the HCI can be verified.

## **1.2 SOURCE DOCUMENTS**

This TBM HCI Specification draws from the following sources for defining the TBM user interface:

- The DOD HCI Style Guide,
- User Interface Specifications for the JMCIS,
- The Air Force Standard System Center GUI Standards,
- MIL-STD-1472D, Human Engineering Design Criteria for Military Systems, Equipment, and Facilities,
- MIL-STD-1801, User Computer Interface,

- Guidelines for Designing User Interface Software (ESD-TR-86-278),
- Draft IEEE P12012 Recommended Practice for Graphical User Interface Drivability,
- The OSF/MOTIF™ Style Guide,
- CTAPS Software User's Manual (SUM) for the Human-Machine Interface (HMI), and
- GUI Design Guidelines for Bellcore Software Products.

The Air Force Standard System Center GUI Standards and the User Interface Specifications for the JMCIS are the most specific collections of HCI interface rules and guidelines. Consequently, the TBM HCI Specification draws heavily from these documents. The TBM HCI Specification exceeds existing HCI interface guidance by specifying TBM-specific rules for common elements. These elements include map symbology, screen icons, TBM data element terminology and TBM display element abbreviations. This TBM HCI Specification also provides guidelines to be used for developing rules for new elements not covered in the specification. For example, as the need arises, the design of a new map symbol will be guided by TBM-specific guidance found in the TBM HCI Specification. TBM-specific Motif widget resource settings as well as TBM-specific examples of menus, screen diagrams, and command lists are also found in the TBM HCI Specification.

### **1.3 COMPLIANCE**

TBM system integrators shall comply with the user interface specifications presented in this document. Application unique user interface specifications shall be identified by application developers and included as addendum to this document. User interface specifications presented in the TBM HCI Specification shall be applied in the development of all new applications and in the upgrade of existing applications.

Many guideline documents draw a distinction between mandatory or "shall" provisions, and recommended or "should" provisions. The TBM HCI Specification attempts to reduce this distinction. This is because history has shown that "should" or recommended provisions are routinely ignored by developers. However, the document must allow flexibility in the development of future applications. Consequently, some guideline-related "should" provisions are retained (e.g., Section 8.4.2, Guidelines on Color Selection). When the requirements of this document cannot be met by applications developers, acceptable reasons may exist. Application developers should submit their reasons for not complying with the TBM HCI Specification to the Electronic Systems Center for a waiver. If the waiver is approved, the waived requirements shall be documented in an application-specific addendum to this specification so that other developers can benefit from the solutions proposed.

### **1.4 TAILORING OF THE MOTIF STYLE GUIDE AND TOOLKIT**

Tailoring the OSF/MOTIF™ Style Guide and the toolkit is required for TBM to select among choices of methods, remove functionality unsuitable for particular application areas, and improve upon Motif conventions. A tailored Motif toolkit shall result. An example of tailoring can take the form of customized widgets and gadgets created for use by developers, rules specifying settings

for Motif resources, or pre-set Motif resources. In all other instances, the standard Motif widget library and toolkit shall be used, and widgets and tools shall not be created to replace existing Motif standard widgets. Guidance offered in the Motif style guide shall be followed, except for the exceptions noted in the remainder of this document.

## 1.5 TBM HCI SPECIFICATION FORMAT AND DEVELOPMENT

The TBM HCI Specification contains the following sections: Design Decision Filters, Interaction Issues, System Concepts, Menus, Controls, and Windows. Design decision filters refer to the decisions which affect the user interface design. These decisions include: understanding the skills of users, the hardware and software chosen for the application, and the environment in which the application will be deployed. Interaction issues specify the manner in which users interact with an application. The system concepts include the meaningful concepts of the user interface. This includes the definitions of the objects, actions, and attributes of a system. Sections on the menu and control objects are provided. Also provided is a section on system-level windows as well as application-level windows. Finally, a section on task-specific windows is provided. Task-specific windows include help windows, data entry windows, text windows, tabular data windows, graphic display windows, map windows, and message handling windows.

The first phase of the TBM HCI Specification development task was to select the appropriate design guidelines and rules from the DOD HCI Style Guide, Addendum 1 (User Interface Specifications for the JMCIS), and the Air Force Standard System Center GUI Standards.

The second phase of the TBM HCI Specification development task was to identify any differences between the User Interface Specifications for the JMCIS and the Standard System Center GUI Standards. Once these differences were identified they were resolved and incorporated into the TBM HCI Specification.

The third phase of the TBM HCI Specification development task defined TBM-specific user interface design rules. These rules address topics such as tabular lists, map symbology, screen icons, and TBM data element terminology abbreviations.

When possible, design rules are followed with example figures or tables. Some examples and tables are drawn from the Air Force (AF) Standard System Center (SSC) GUI Standards or the User Interface Specifications for the JMCIS. Other examples or tables have resulted from TBM-specific tailoring of the HCI Specification.

The source of each design rule is indicated by one or more of the following abbreviations.

MS1472	MIL-STD-1472D, Human Engineering Design Criteria for Military Systems, Equipment, and Facilities
MS1801	MIL-STD-1801, User/Computer Interface
ESD-TR	ESD-TR-86-278, Guidelines for Designing User Interface Software
MSG	Motif™ Style Guide
DODIIS	DODIIS Style Guide

DODSG	Department of Defense Human Computer Interface Style Guide
AFSSC	Air Force Standard System Center Graphical User Interface Standards
JMCIS	User Interface Specifications for the Joint Maritime Command Information System
Bellcore	Graphical User Interface Design Guidelines for Bellcore Software Products
Kobara	Visual Design with OSF/Motif

Interested readers are directed to the source for more information regarding specific user interface design rules. When no source is listed, the design rule has resulted from TBM-specific tailoring.

The TBM HCI Specification has expanded on the source documents by providing what are termed "Developer Notes". These "Notes" are intended to provide more specific guidance to the user interface developers on how the design rules specified in TBM HCI Specification can be achieved.

## **SECTION 2**

### **DESIGN DECISION FILTERS**

Design decision filters predefine a perspective on the design of the software system. The design decision filters represent the system characteristics which determine how general HCI guidelines shall be defined for a specific system. Design decision filters include the characteristics of the user population, the physical environment, and the input and output devices chosen to access the software.

#### **2.1 USER POPULATION**

This document is geared toward application developers who develop software for operational personnel. Operational personnel are not expected to have system administrator-level software skills, nor are they expected to be familiar with the UNIX operating commands. In fact, operational personnel should be prevented from accessing the UNIX shell.

##### **2.1.1 User Skills and Experiences**

The purpose of this software specification is to provide a common framework for HCI design and implementation. The intent is to promote higher productivity and less training time in acquiring user skills and experiences.

#### **2.2 PHYSICAL ENVIRONMENT**

It is expected that operators will use TBM hardware and software in normal "office" working environments. This has an impact on the screen colors chosen for core and application software. If darkened battlefield environments need to be accommodated, they will be addressed in subsequent releases of this specification.

#### **2.3 INPUT DEVICES**

Input devices shall include a keyboard and a pointing device. The pointing device shall be a mouse for the workstations and a keyboard cursor control for the Sparcbook laptop.

##### **2.3.1 Interchangeability Between Input Devices**

Two main input devices shall be provided, the keyboard and a pointing device. As much as possible, users shall be able to use the keyboard and the pointing device interchangeably. The OSF/MOTIF™ Style Guide requires full interchangeability between pointing device and keyboard. The DODIIS style guide also calls for full interchangeability but only describes keyboard actions for navigation in menus. Although it is expected that the keyboard shall be used primarily for text input, it should also be available as a backup so users can continue to operate a system should a pointing device fail.

1. The pointing device is the primary means of user-computer interaction.  
Source: MSG, DODIIS, DODSG, JMCIS
2. The keyboard is available for performing most operations primarily as a backup.  
Source: MSG, DODIIS, DODSG, JMCIS
3. All operations in Table 2-1 except range selection in text are available from keyboard.  
Source: MSG, JMCIS
4. Range selection in text is included if integral to the functionality of an application.  
Source: MSG, JMCIS

### **2.3.2 Pointing Device Input**

The following basic physical operations shall be supported with a pointing device: Press, Drag, Release, Click, and Double Click.

#### **2.3.2.1 The Pointer**

1. The pointing device is associated with a single pointer on the screen.  
Source: MSG, JMCIS
2. The hotspot of the pointer indicates the precise location where operations occur.  
Source: MSG, JMCIS
3. The pointer moves anywhere on the screen.  
Source: MSG, JMCIS
4. When users move the pointing device, the pointer moves in the corresponding direction.  
Source: MSG, DODIIS, DODSG, JMCIS
5. The pointing device-to-pointer movement ratio is close to 1:1 for most user interactions.  
Source: MSG, JMCIS
6. The pointer remains in place until moved by users; it is not moved by an application.  
Source: MSG, DODIIS, DODSG, JMCIS
7. The pointer deviates less than .05 inch in any direction; .01 inch for high stability.  
Source: MS1801, JMCIS
8. When a system uses multiple physical displays, the pointer moves between multiple displays when users move the pointing device.  
Source: JMCIS
9. When a system uses only one physical display, the pointer does not move beyond the physical display boundary or disappear from sight.  
Source: JMCIS
10. The location of the hotspot does not move as the pointer changes shape. Refer to Table 2.2.  
Source: MSG, JMCIS

**Table 2-1. Motif Default Bindings for Keyboard Operations**

<b>Virtual Keys</b>	<b>Operation</b>
<u>Window Navigation</u>	
<Alt> <Tab>	Navigates to the next window family.
<Alt> <Shift> <Tab>	Navigates to the previous window family.
<Alt> <F6>	Navigates to the next window within a window family.
<Alt> <Shift> <F6>	Navigates to the previous window within a window family.
<u>Navigation and Selection in Menus</u>	
<F10> <Shift><Menu>	Activates/Exits a menu bar.
<Shift> <F10> <Menu>	Activates/Exits a pop-up menu.
<Alt> <Space> <Shift> <Escape>	Activates a Window Menu.
<Space> <Select>	Displays an option menu.
<Up>	Navigates up within a menu.
<Down>	Navigates down within a menu.
<Left>	Navigates left within a menu bar or menu.
<Right>	Navigates right within a menu bar or menu.
<Return> <Enter> <Space>	Selects a menu title or menu option.
<u>Navigation Within Windows</u>	
<Ctrl> <Tab>	Navigates to the next tab group.
<Tab>	Navigates to the next tab group except in multi-line text.
<Ctrl> <Shift> <Tab>	Navigates to the previous tab group.
<Shift> <Tab>	Navigates to the previous tab group except in multi-line text.
<Up>	Navigates up one increment (e.g., one line).
<Down>	Navigates down one increment.
<Left>	Navigates left one increment.
<Right>	Navigates right one increment.
<PageUp>	Navigates up one page.
<PageDown>	Navigates down one page.
<PageLeft> <Ctrl> <PageUp>	Navigates left one page.
<PageRight> <Ctrl> <PageDown>	Navigates right one page.

Table 2-1. Continued

Virtual Keys	Operation
<u>Navigation Within Windows</u>	
<Ctrl> <Up>	Navigates up one large increment (e.g., one paragraph).
<Ctrl> <Down>	Navigates down one large increment.
<Ctrl> <Left>	Navigates left one large increment.
<Ctrl> <Right>	Navigates right one large increment.
<Home>	Navigates to the leftmost element (e.g., the beginning of a line).
<End>	Navigates to the rightmost element (e.g., the end of a line).
<Ctrl> <Home>	Navigates to the top leftmost element (e.g., the beginning of data).
<Ctrl> <End>	Navigates to the bottom rightmost element (e.g., the end of data).
<u>Selection</u>	
<Shift> <F8>	Toggles between normal and add mode.
<Ctrl> <Shift> <Space>	Extends a selection to the cursor position.
<Shift> <Space> <Shift> <Select>	Extends a selection to the cursor position except in text.
<Space> <Select>	Selects an element in a collection except in text.
<Ctrl> <Space>	Selects an element in a text collection.
<Ctrl> </>	Selects an entire collection.
<Ctrl> <^>	Deselects an entire selection.
<u>Other Actions</u>	
<Enter> <Ctrl> <Return>	Invokes a default action.
<Return>	Invokes a default action except in multi-line text.
<Cancel> <Escape>	Stops or cancels the current interaction.
<Help> <F1>	Obtains help on an item.
<Shift> <Help> <Shift> <F1>	Invokes context help mode.
<u>Text Entry</u>	
<Delete>	Deletes one character to the right.
<Backspace>	Deletes one character to the left.
<u>Other Actions</u>	
<Space>	Inserts a space.

**Table 2-1. Concluded**

<b>Virtual Keys</b>	<b>Operation</b>
<Return>	In multi-line text, inserts a new line.
<Tab>	In multi-line text, inserts a tab or moves to the next tab stop.
<Insert>	Toggles between replace and insert mode.
<b>Object Transfer</b>	
<Cut> <Shift> <Delete>	Cuts the current selection to the clipboard.
<Copy> <Ctrl> <Insert>	Copies the current selection to the clipboard.
<Paste> <Shift> <Insert>	Pastes the clipboard contents.
<Undo> <Alt> <Backspace>	Reverses the most recently performed action.
<b>Range Selection in Text</b>	
<Shift> <PageUp>	Extends the selection up one page.
<Shift> <PageDown>	Extends the selection down one page.
<Shift> <PageLeft> <Ctrl> <Shift> <PageUp>	Extends the selection left one page.
<Shift> <PageRight> <Ctrl> <Shift> <PageDown>	Extends the selection right one page.
<Ctrl> <Shift> <Up>	Extends the selection up one paragraph.
<Ctrl> <Shift> <Down>	Extends the selection down one paragraph.
<Ctrl> <Shift> <Left>	Extends the selection left one word.
<Ctrl> <Shift> <Right>	Extends the selection right one word.
<Shift> <Up>	Extends the selection up one line.
<Shift> <Down>	Extends the selection down one line.
<Shift> <Left>	Extends the selection to the left.
<Shift> <Right>	Extends the selection to the right.
<Shift> <Home>	Extends the selection to the beginning of a line.
<Shift> <End>	Extends the selection to the end of a line.
<Ctrl> <Shift> <Home>	Extends the selection to the beginning of the text.
<Ctrl> <Shift> <End>	Extends the selection to the end of the text.

### 2.3.2.2 Pointer Shapes

1. The pointer shapes in Table 2-2 are used when providing the functions indicated.  
Source: MSG, DODIIS, DODSG, JMCIS
2. The applications redefine pointer shape only when the pointer is in an application window.  
Source: MSG, JMCIS

3. The upper-left-pointing arrow is used for object selection in most windows.  
Source: MSG, JMCIS
4. The X pointer shape is not used by an application.  
Source: MSG, JMCIS
5. New pointer shapes are not created for functions that already have a shape.  
Source: MSG, JMCIS
6. Pointer shapes are not associated with functions they were not designed to represent.  
Source: MSG, JMCIS
7. New pointer shapes are easy to see, with a hotspot that is obvious and easy to locate.  
Source: MSG, JMCIS
8. New pointer shapes suggest their purpose and are not confused with other objects.  
Source: MSG, JMCIS

**Table 2-2. Pointer Shapes**

**Pointing**



The upper-left pointing arrow is used in most window areas for object selection. The hotspot for the arrow pointer is the point of the arrow.



The I-beam pointer is used in text areas to position the text insertion cursor and perform actions on text. The I-beam pointer is hidden during the time between any keyboard action and pointer movement (i.e., when the text entry is occurring at the location of the text insertion cursor). The hotspot for the I-beam pointer is on the vertical bar of the I-beam about one-third from the top.

**Working/Caution**

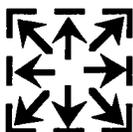


The hourglass pointer is used to indicate that an operation is being performed in a window area. When the hourglass pointer is displayed, all pointing devices and keyboard actions are ignored in the area. If the hourglass pointer is not available the watch pointer shall be used.



The caution pointer is used to indicate that action is expected in another window area before input can be made in the current area and that the pointer has no effect in the area. When the caution pointer is displayed, all pointing devices and keyboard actions are ignored in the area.

**Resizing**



The resize pointers are used to indicate positions for area resize, with the direction of the arrow in the pointer indicating the direction of increasing size. The horizontal and vertical resize pointers indicate resize in either the horizontal or vertical direction. The diagonal resize pointers indicate resize in both the horizontal and vertical directions simultaneously. The hotspot for the resize pointers is on the elbow or the line at the position pointed to by the arrow. A resize pointer appears when the pointer is on the frame boarder.

### **Moving**



The four-directional arrow pointer indicates a move operation in progress or a resize operation before the resize direction has been determined. During a resize operation, the four-directional arrow pointer indicates a direction for resizing and changes to the appropriate resize arrow when the pointer is on the frame boarder. The hotspot for the four-directional arrow pointer is the spot where the arrows intersect.

### **Sighting**



The sighting pointer is used to make fine position selections (e.g., to select a location on a map display). The hotspot for the sighting pointer is the spot where the lines intersect.

### **Dragging**

See Figure 3-1

Drag icons are used as pointers when the drag transfer method (drag and drop) is being performed to move, copy, and link graphical and textual information. See Section 3.4.4 for more information.

---

### **2.3.2.3 Pointing Device Buttons**

1. The Select (S) function is bound to the left button on a two- or three-button pointing device. This button will be referred to as the S button throughout the remainder of this document.  
Source: MSG, DODIIS, DODSG, JMCIS
2. The Transfer (T) function is bound to the middle button on a three-button pointing device. This button will be referred to as the T button throughout the remainder of this document.  
Source: MSG, DODIIS, DODSG, JMCIS
3. The Menu function is bound to the right button on a three-button pointing device. This button will be referred to as the M button throughout the remainder of this document.  
Source: MSG, DODIIS, DODSG, JMCIS
4. The Transfer function is bound to the right button on a two-button pointing device.  
Source: MSG, DODIIS, DODSG, JMCIS
5. The Menu function is bound to the two buttons together on a two-button pointing device.  
Source: MSG, DODIIS, DODSG, JMCIS
6. Left-handed users can exchange the functions between the left and right buttons.  
Source: MSG, DODIIS, DODSG, JMCIS

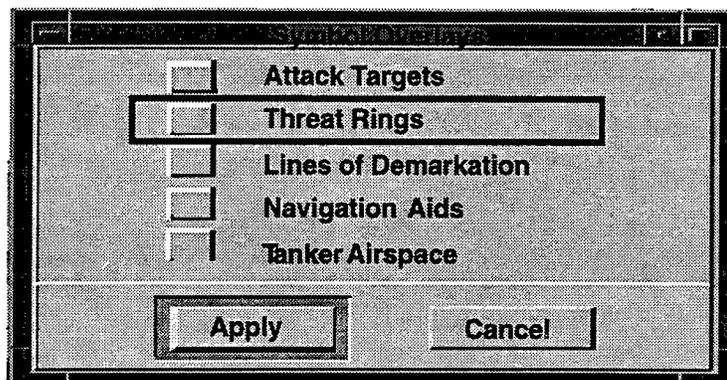
### **Specific TBM USI Specifications for the Pointer**

1. A three-button mouse shall be used on the SUN and HP workstations.
2. A three-button mouse or cursor control shall be used on the Sparcbook laptop.
3. A two-button mouse shall be used on the IBM 700C laptop (see button assignments above).

## **2.3.3 Keyboard Input**

### **2.3.3.1 The Location Cursor**

1. The object that has keyboard focus in a window is identified by a location cursor.  
Source: MSG, JMCIS
2. The location cursor is controlled from the keyboard. Movement of the pointing device shall be mapped to the pointer and shall not affect the position of the location cursor.  
Source: MSG, JMCIS
3. When a user clicks on an object, it receives focus and the location cursor moves to the object.  
Source: MSG, JMCIS
4. When a window is displayed, the location cursor is on the control most likely to be selected.  
Source: MSG, JMCIS
5. When a window regains focus, the location cursor is on the control that last had focus.  
Source: MSG, JMCIS
6. The box cursor (see Figure 2-1) is the default shape for the location cursor.  
Source: MSG, JMCIS
7. The text cursor is displayed in the text with keyboard focus and indicating where typed text appears.  
Source: MSG, AFSSC, JMCIS
8. The text cursor shape is a vertical bar in insert mode and a box in replace mode.  
Source: MSG, AFSSC, JMCIS
9. The flash rate for the text cursor is 2-5 Hz.  
Developer Note: The flash rate can be adjusted through XmnBlinkRate resource. Its default setting is at 500 milliseconds or 2 Hz.  
Source: MSG, AFSSC, JMCIS
10. When the text with the cursor loses focus, the cursor is grayed out and stops flashing.  
Source: MSG, JMCIS
11. When the text regains focus, the text cursor returns to normal appearance and resumes flashing.  
Source: MSG, JMCIS
12. If the text cursor disappears when focus is lost, it reappears at the same place when focus returns.  
Source: MSG, JMCIS
13. When designing a user interface, existing cursor shapes are used. New cursor shapes are created only if existing cursor shapes do not provide functions desired.  
Source: MSG, JMCIS



**Figure 2-1. Example Box Cursor**

### **2.3.3.2 The Text Cursor During Text Entry**

1. The text cursor appears at the beginning of the text area where typing is most likely to occur.  
Source: MSG, DODIIS, DODSG, JMCIS
2. When users click the S button in the text area which already contains text, the text cursor appears at the pointer location. When users click the S button in a text area which does not contain text, the text cursor appears in the left-most position of the text area.  
Source: MSG, DODIIS, DODSG, JMCIS
3. When users begin typing, the pointer disappears from the screen.  
Source: JMCIS
4. The pointer reappears when users stop typing or move the pointing device.  
Source: JMCIS
5. The pointer changes to an I-beam shape only in an area where the text entry is possible.  
Source: MSG, AFSSC, JMCIS
6. The text cursor appears only in text entry areas and not where the text entry is not possible.  
Source: MSG, AFSSC, JMCIS
7. The text entry is possible only after the text cursor is visible at a legal location and not possible when the text cursor is not visible.  
Source: JMCIS
8. The text cursor is highly visible whenever it appears in a text entry area.  
Source: MSG, AFSSC, JMCIS

### **2.3.3.3 Actions in Text Entry**

1. When a text cursor is placed into a text field, insert mode is the default for text entry.  
Source: MSG, AFSSC, JMCIS
2. Insert mode adds new text to the left of the text cursor and moves existing text to the right.  
Source: MSG, JMCIS
3. Overstrike mode replaces the character to the right of the text cursor with the new character that is typed.  
Source: MSG, JMCIS
4. The insert key toggles between the insert and overstrike mode for text entry.  
Source: JMCIS  
Developer Note: See also section 9.2.2 #12.
5. Backspace deletes the character to the left of the text cursor.  
Source: MSG, JMCIS
6. Delete, deletes the character to the right of the text cursor.  
Source: MSG, JMCIS
7. Double clicking on text selects and highlights the word at the location of the pointer.  
Source: MSG, JMCIS
8. Dragging the pointer across the text also selects and highlights the text.  
Source: MSG, JMCIS
9. In typing, the highlighted text disappears and the text cursor plus new text is inserted.  
Source: MSG, JMCIS
10. Delete, deletes highlighted text. The text cursor appears and other unhighlighted text moves to the left.  
Source: MSG, AFSSC, JMCIS

### **2.3.3.4 Mapping Virtual to Actual Keys**

1. The keyboard mappings in Table 2-3 are used to perform the operations in Table 2-3. Figures 2-2, 2-3, and 2-4, and 2-5 depict key locations for the target keyboards. Table 2-3 maps the keys used in the Motif default bindings to each one of the TBM target keyboards.  
Source: MSG, JMCIS
2. New key bindings are consistent with those used by other applications in the system.  
Source: MSG, JMCIS
3. The combination of the Alt key and alphanumeric characters is used only in mnemonic keyboard accelerators.  
Source: MSG, JMCIS

4. Other than the use of Shift and an alphanumeric key to denote uppercase, the use of Shift, Alt, and Ctrl with other keys is limited to keyboard accelerators.  
Source: MSG, JMCIS

**Table 2-3. Mapping of Sun, Hewlett Packard, and Sparcbook Keys to Motif Default Bindings**

Virtual Key	Sun4 Key	Sun5 Key	HP Key	Sparcbook Key
<>	/	/	/	/
< >	\	\	\	\
<Alt>	Alt	Alt	Extendchar	Alt
<Backspace>	Backspace	Backspace	Backspace	Backspace
<Cancel>	Esc	Esc	Del Esc	Esc
<Copy>	Copy	Copy	Ctrl + Insertchar	Copy
<Ctrl>	Control	Control	Ctrl	Ctrl
<Cut>	Cut	Cut	Shift + Delchar	Cut
<Delete>	Delete	Del	Delchar	Del
<Down>	Down	Down	Down	Down
<End>	End	End	Extendchar + Right	End
<Enter>	Enter	Enter	Enter	Enter
<Escape>	Esc	Esc	Del Esc	Esc
<F1> - <F10>	F1 - F10	F1 - F10	F1 - F10	F1 - F10
<Help>	Help	Help	F1	Help
<Home>	Home	Home	Home	Home
<Insert>	Ins	Insert	Insertchar	Ins
<Left>	Left	Left	Left	L
<Menu>	Shift + F10	Shift + F10	Menu	Shift + F10
<PageDown>	PgDn	PgDn and Page Down	Next	PgDn
<PageLeft>	Control + PgUp	Control + PgUp	Ctrl + Prev	Ctrl + PgUp
<PageRight>	Control + PgDn	Control + PgDn	Ctrl + Next	Ctrl + PgDown
<PageUp>	PgUp	PgUp and Page Up	Prev	PgUp
<Paste>	Paste	Paste	Shift + Insertline	Paste
<Return>	Return	Return	Return	
<Right>	Right	Right	Right	R
<Select>	Space	Space	Select	Space
<Shift>	Shift	Shift	Shift	Shift
<Space>	Space	Space	Space	Space
<Tab>	Tab	Tab	Tab	Tab
<Undo>	Undo	Undo	Extendchar + Backspace	
<Up>	Up	Up	Up	

## 2.4 OUTPUT DEVICES

The following output devices are planned for TBM: Sun Sparc 2 and Sun Sparc 10, Hewlett Packard 700, and Sparcbook portable laptops. The Sun workstation and the Hewlett Packard 700 workstation shall support a 19 inch color cathode ray display as an output device. The Sparcbook shall support an active matrix liquid crystal display as an output device. TBM shall support a variety of printer devices including the following:

- Genicom Printer 1200 baud 132 columns
- Genicom Printer 1200 baud 80 columns
- Genicom Printer 9600 baud 132 columns
- Genicom Printer 9600 baud 80 columns
- Hewlett Packard II
- Hewlett Packard LaserJet IID
- Hewlett Packard LaserJet IIP
- Hewlett Packard III
- Hewlett Packard DeskJet Plus
- Hewlett Packard DeskJet
- Korean Font Postscript
- Miltope Printer
- Postscript
- Postscript2

Templates shall be made available so additional printing devices can be supported.



Stop L1 08	Again L2 0A	F1 0C	F2 0D	F3 0F	F4 11	F5 13	F6 15	F7 17	F8 18	F9 19	F10 0E	F11 10	F12 12	Delete 49	Pause R1 1C	PrSc R2 3D	Scroll Lock 1E	Num Lock 59
Prps L3 20	Undo L4 21	Esc 1	24	25	26	27	28	29	30	31	32	33	34	35	R4 34	R5 35	R6 3C	4Z
Front LS 38	Copy L6 3A	Tab 3C	3D	3E	3F	40	41	42	43	44	45	46	47	48	7 Home 4B	8 ↑ 4C	9 PgUp 4D	+
Open L7 4F	Paste L8 50	Control 53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F	4 ← 62	5 R11 63	6 ⇒ 64	84
Find L9 66	Cut L10 68	Shift 6A	6B	6C	6D	6E	6F	6G	6H	6I	6J	6K	6L	6M	1 End 77	2 ↑ 78	3 PgDn 79	Enter
Help	7D	7E	7F	7G	7H	7I	7J	7K	7L	7M	7N	7O	7P	7Q	0 Ins	1 ← 65	2 Del 35	61

Figure 2-3. Sun4 Keyboard  
(from the User Interface Specifications for the JMCIS)

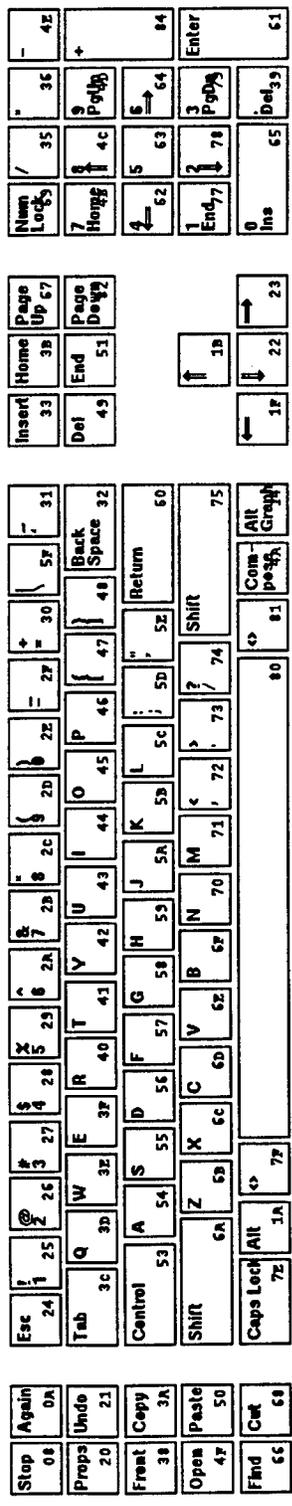


Figure 2-4. Sun5 Keyboard

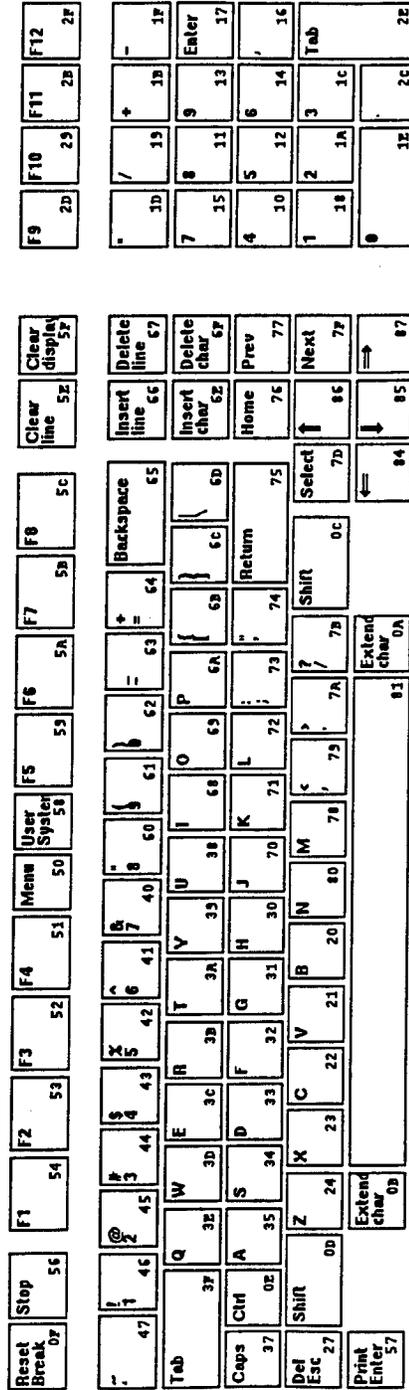


Figure 2-5. Hewlett Packard 700 Series Keyboard  
(from the User Interface Specifications for the JMCIS)

## SECTION 3

### INTERACTION ISSUES

#### 3.1 WINDOW NAVIGATION

##### 3.1.1 Input Focus Policy

1. Only one window on the screen has input focus at any time.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. Users assign focus explicitly and do so either with the pointing device or from the keyboard.  
Source: MSG, DODIIS, DODSG, JMCIS  
Developer Note: This can be accomplished by placing the line:  
Mwm\*keyboardFocusPolicy: Explicit into the .Xdefaults file.

##### 3.1.2 Assigning Focus to a Window

1. Users assign focus by moving the pointer into a window and clicking the S button.  
Source: MSG, JMCIS
2. If users click in an empty window area, the frame highlights.  
Source: MSG, JMCIS
3. If users click in the title bar, the frame highlights and the window is raised to the front.  
Source: MSG
4. If users click on an object within a window, the window frame highlights, the window is raised, and an object is selected.  
Source: MSG, JMCIS
5. Alt+Tab and Alt+Shift+Tab move the focus forward and backward through window families.  
Source: MSG, JMCIS
6. Alt+F6 and Alt+Shift+F6 move the focus forward and backward through windows in a family.  
Source: MSG, JMCIS

#### 3.2 MENU NAVIGATION

##### 3.2.1 Pointing Device Navigation

1. Ctrl and clicking the S button on an object moves the location cursor to the object but does not select it.  
Source: MSG, JMCIS

2. Auto scrolling is available when the pointer is on a scrollable control such as a text block or a list.  
Source: MSG, JMCIS

### **3.2.2 Keyboard Navigation Control**

1. Ctrl+Tab and Ctrl+Shift+Tab move the location cursor to the next and previous tab group, respectively.  
Source: MSG, JMCIS
2. Tab and Shift+Tab also move to the next and previous tab group except in multi-line text.  
Source: MSG, JMCIS
3. The location cursor is on the default or first control when it moves to a tab group.  
Source: MSG, JMCIS
4. The location cursor skips a tab group if none of the controls can have keyboard focus.  
Source: MSG, JMCIS
5. Up, Down, Left, and Right move the location cursor between controls in the tab group with focus.  
Source: MSG, JMCIS
6. Moving the location cursor to a control does not change the state of the control.  
Source: MSG, JMCIS
7. Cursor movement is upper left to lower right, with wrapping, unless control is scrollable.  
Source: MSG, JMCIS
8. Arrows move the location cursor one increment at a time (e.g., to the next line in text, to the next item in a list); Ctrl+arrow keys move the location cursor one large increment (e.g., move the text cursor to the next word instead of the next character).  
Source: MSG, JMCIS
9. Begin and End moves the cursor to the leftmost/rightmost element in a control.  
Source: MSG, JMCIS
10. Ctrl+Begin and Ctrl+End move the cursor to the beginning/end element in a control.  
Source: MSG, JMCIS
11. PageUp, PageDown, PageLeft, and PageRight scroll one page (minus one line).  
Source: MSG, JMCIS
12. Focus remains on an element where it was before scrolling began and may not be in view.  
Source: MSG, JMCIS
13. When keyboard action alters the element with focus, scrolling occurs so the element is in view.  
Source: MSG, JMCIS

### **3.2.3 Keyboard Navigation for Graphic Objects**

1. Navigation among graphics objects uses the same key bindings as navigation in controls.  
Source: MSG, JMCIS

## **3.3 OBJECT SELECTION**

### **3.3.1 Pointing Device Selection Methods**

1. Click the S button on an object to select it. When another object is selected, previously selected objects are deselected.  
Source: MSG, JMCIS
2. Click the S button on multiple objects one at a time to select them. The objects are highlighted and selected.  
Source: MSG, JMCIS
3. Drag the pointer over contiguous objects in a range with the S button to select them.  
Source: MSG, JMCIS
4. Extend the range selection by pressing Shift and clicking the S button on the last object in the range.  
Source: MSG, JMCIS
5. Add/Remove a discontinuous object by pressing Ctrl and clicking the S button on the object.  
Source: MSG, JMCIS
6. Add/Remove a discontinuous range by pressing Ctrl and dragging with S button over range.  
Source: MSG, JMCIS
7. A bounding box appears when dragging the pointer over elements in a two dimensional collection.  
Source: MSG, JMCIS
8. Users can select and deselect all objects in a collection with the pointing device.  
Source: MSG, JMCIS
9. Users can select an object from a group of closely overlapping elements.  
Source: MSG, JMCIS

### **3.3.2 Keyboard Selection Methods**

1. Add mode is used to select one element or multiple objects one at a time. Normal mode is used to select multiple contiguous objects.  
Source: MSG, JMCIS

2. Add mode and normal mode are used to select multiple discontinuous objects.  
Source: MSG, JMCIS
3. Space (and the virtual key Select) selects an object or multiple objects one at a time.  
Source: MSG, JMCIS
4. Space (and the virtual key Select) sets the anchor for selecting a range of contiguous objects.  
Source: MSG, JMCIS
5. Shift+Space (and Shift+Select) extends selection from anchor to last object selected.  
Source: MSG, JMCIS
6. Shift+F8 toggles between add mode and normal mode.  
Source: MSG, JMCIS
7. Ctrl+/ selects all of the objects in a collection.  
Source: MSG, JMCIS
8. Ctrl+\ deselects all of the objects in a collection.  
Source: MSG, JMCIS
9. Cancel undoes a selection action and returns the objects to their normal appearance.  
Source: MSG, JMCIS

### **3.3.3 Other Types of Selection**

1. A default action in a window is executed by double clicking when making a selection.  
Source: MSG, JMCIS
2. Enter or Ctrl+Return invokes the default action after making a selection in a window.  
Source: MSG, JMCIS
3. Return invokes the default action in a window if the focus is on an object other than multi-line text.  
Source: MSG, JMCIS
4. Extended selection is available in text.  
Source: MSG, JMCIS
5. Click places the text cursor, double click selects a word, triple click selects a line.  
Source: MSG, JMCIS
6. Cancel, cancels the action being executed and returns the object to its state prior to action.  
Source: MSG, JMCIS

### **3.4 OBJECT TRANSFER**

1. Individual objects or a collection of objects shall be able to be transferred in a window or to another window in the same application as well as into other applications. This shall be accomplished by one or more of the following four techniques: drag transfer or drag and drop, clipboard transfer, primary transfer, or quick transfer.  
Source: MSG, JMCIS
2. For each transfer technique the following operations shall be generally available: Copy, Move, and Link.  
Source: MSG

#### **3.4.1 Clipboard Transfers**

The clipboard transfer technique transfers an object selection from a source to the clipboard and then from the clipboard to the destination.

1. The clipboard transfers operations of Cut, Copy, and Paste are usually performed using the Edit menu of an application.  
Source: MSG
2. Clipboard transfer is available whenever an editable object has keyboard focus.  
Source: MSG, JMCIS
3. A clipboard transfer operation can be invoked from Pull Down or Pop-up Menus and have standard keyboard bindings. Access to clipboard transfer is provided in consistent fashion throughout an application.  
Source: MSG, JMCIS
4. Keyboard accelerators are available to perform other editing operations (e.g., Clear, Delete).  
Source: MSG, JMCIS
5. Users can view the clipboard contents and are informed when they cut/copy an object of excessive size for the clipboard.  
Source: MSG, JMCIS
6. Cut clears the clipboard, stores a copy of the object in the clipboard, and removes the object from the window.  
Source: MSG, JMCIS
7. Cut (and Shift+Delete) performs a cut operation.  
Source: MSG, JMCIS
8. If the cut object is a graphic, previous space is left blank; if text, remaining text is compressed.  
Source: MSG, JMCIS

9. Copy clears the clipboard and stores the object copy in the clipboard; object stays in its original location.  
Source: MSG, JMCIS
10. Copy (and Ctrl+Insert) performs a copy operation.  
Source: MSG, JMCIS
11. Paste copies the object in the clipboard to a new location.  
Source: MSG, JMCIS
12. Paste (and Shift+Insert) performs a paste operation.  
Source: MSG, JMCIS
13. If the clipboard contents is text, paste copies the clipboard contents to the location of text cursor and existing text appears to the left of cursor. If existing text is selected, paste copies the clipboard contents to the location of previously selected text and removes the previously selected text.  
Source: MSG, JMCIS
14. If the clipboard contents is graphic, paste copies the clipboard contents to the pointer location in a window with input focus. The pasted object remains in the clipboard until another object is cut/copied into it.  
Source: MSG, JMCIS
15. A Copy Link entry in the Edit menu can be used to place a link in the clipboard to selected elements of the target component so that the link can be placed in a destination by subsequent use of the Paste or Paste Link.  
Source: MSG

### **3.4.2 Primary Transfer**

The primary transfer technique transfers the primary selection directly to a destination without using the clipboard for immediate storage of data.

1. A primary transfer, transfers operations of primary copy, primary move, and primary link are available.  
Source: MSG
2. A primary transfer operation can be invoked from Pull Down or Pop-up Menus and have standard keyboard bindings. Access to primary transfer is provided in consistent fashion throughout an application.  
Source: MSG
3. Primary transfers shall also be invoked using the T button.  
Source: MSG
4. The default operation for primary transfer using the T button is copy.  
Source: MSG

5. In an editable collection, a Primary Copy is performed by the following: <Shift> T button click, <Alt> <Copy> and <Alt> <Ctrl> <Insert>.  
Source: MSG
6. In an editable collection, a Primary Move is performed by the following: T button click, <Ctrl> T button click, <Alt> <Cut>, and <Alt> <Shift> <Delete>.  
Source: MSG
7. In an editable collection, a Primary Link is performed by the following: <Ctrl> <Shift> T button click.  
Source: MSG

### **3.4.3 Quick Transfer**

A quick transfer technique allows the user to indicate a range of objects (called a secondary selection) that are transferred to the destination component.

1. The quick transfer, transfers operations of quick copy, quick cut, and quick link are available.  
Source: MSG
2. Quick transfers shall be invoked using the <Alt> T button motion.  
Source: MSG
3. The default operation for quick transfer using the T button is copy.  
Source: MSG
4. Text components must support quick transfer.  
Source: MSG
5. If quick transfer is supported, <Alt> T button motion or <Alt> <Ctrl> T button motion must temporarily select elements in the specified range and, on release, must copy them to the insertion position of the destination component.  
Source: MSG
6. If quick transfer is supported, <Alt> <Shift> T button motion must temporarily select elements in the specified range and, on release, must move them to the insertion position of the destination component.  
Source: MSG
7. If quick transfer is supported, <Alt> <Ctrl> <Shift> T button motion must temporarily select elements in the specified range and, on release, must place a link to them at the insertion position of the destination component.  
Source: MSG

### **3.4.4 Drag Transfer (Drag and Drop)**

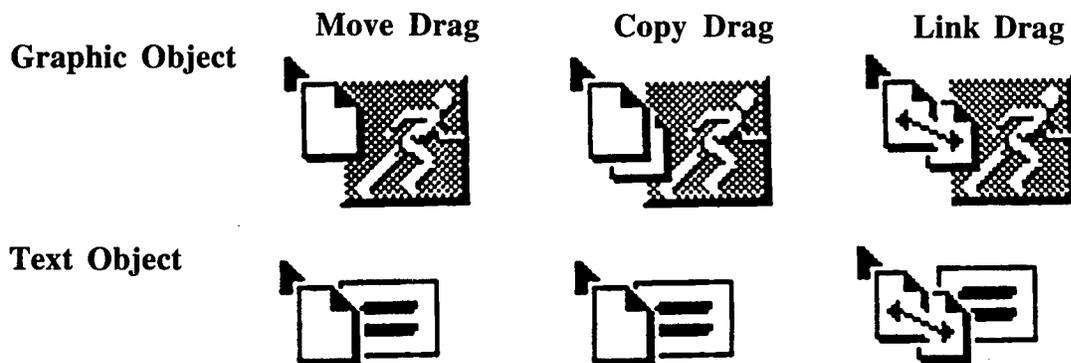
A drag transfer technique provides the user with the capability to drag a selection or an unselected object from a source to a destination. An unselected object can be dragged by using the T button.

1. The drag transfer, transfers operations of primary drag copy, drag move, and drag link are available.  
Source: MSG
2. A drag move operation shall be executed by holding down the Shift key while dragging the object using the T button. If no modifier key is used (that is, just the T button is pressed on an object) the default operation is a move.  
Source: MSG, JMCIS
3. A drag copy operation shall be executed by holding down the Ctrl key while dragging the object using the T button.  
Source: MSG, JMCIS
4. Cancel, cancels a drag operation and returns the object being dragged to the original location.  
Source: MSG, JMCIS
5. Elements moved within a component remain selected after they have been moved.  
Source: MSG, JMCIS
6. Dragging a set of selected elements drags the entire collection.  
Source: MSG, JMCIS
7. Dragging an unselected element in lists and graphics affects only the element.  
Source: MSG, JMCIS
8. Dragging in overlapping elements occurs on the highest draggable element in the stack.  
Source: MSG, JMCIS
9. Pointer shape changes to a drag icon during the drag operation and then back to pointer (see Figure 3-1).  
Source: MSG, JMCIS
10. The drag icon contains a source indicator and may contain operations and state indicators.  
Source: MSG, JMCIS
11. When users must repeatedly move objects by means of a drag transfer action and the drag destination is to the same or a default location, developers shall implement redundant transfer methods. Redundant transfer methods shall include the capability to drag a set of selected objects or double-clicking on an object as a command accelerator for the drag action.

### **3.5 INTERACTIVE CONTROL**

#### **3.5.1 Object-Action Selection**

1. Users first select an object, then select an action to perform on that object.  
Source: MSG, JMCIS



**Figure 3-1. Drag Icons for Move, Copy, and Link Operations**

### **3.5.2 User Control of Interaction**

1. Applications execute an action only in response to explicit user input.  
Source: ESD-TR, MS1801, MSG, DODIIS, DODSG, JMCIS
2. Users can take actions that will interrupt or terminate a process.  
Source: ESD-TR, MS1801, MSG, DODIIS, DODSG, JMCIS

### **3.5.3 Immediate Feedback**

1. When users take an action, there is an immediate and visible response to the action.  
Source: ESD-TR, MS1801, MSG, DODIIS, DODSG, JMCIS
2. A visible response occurs even if the result cannot be displayed immediately.  
Source: ESD-TR, MS1801, MSG, DODIIS, DODSG, JMCIS
3. Visual cues show an application accepting input/temporarily and unavailable/ unavailable.  
Source: ESD-TR, MS1801, MSG, DODIIS, DODSG, JMCIS
4. The appearance of an object provides an indication of its availability.  
Source: ESD-TR, MS1801, MSG, DODIIS, DODSG, JMCIS
5. If an operation requires several actions, users are prompted with the actions to take.  
Source: ESD-TR, MS1801, MSG, DODIIS, DODSG, JMCIS
6. Applications ignore user actions made during periods when input cannot be accepted.  
Source: ESD-TR, MS1801, MSG, DODIIS, DODSG, JMCIS
7. The pointing device and/or the keyboard are disabled when input may be destructive.  
Source: ESD-TR, MS1801, MSG, DODIIS, DODSG, JMCIS
8. Users cannot override disabling, but are able to stop a process.  
Source: ESD-TR, MS1801, MSG, DODIIS, DODSG, JMCIS

### **3.5.4 System Response Time**

1. System response is within .2 seconds of user action; display takes no more than .5-10 seconds.  
Source: MS1472, MS1801, DODSG, JMCIS
2. Requests for new displays can take between 2-10 seconds if an operation requires extensive processing. Timing begins from the time of a user action to the time that a fully populated display is presented.  
Source: MS1472, JMCIS
3. Error feedback is provided to users within 2 seconds of the time error was detected.  
Source: MS1472, JMCIS
4. When a user request takes more than 2 seconds to process, pointer shape changes to a watch or hourglass.  
Source: MS1472, JMCIS
5. When user request takes more than 5 seconds to process, the message window informs the user that the operation is lengthy.  
Source: AFSSC, JMCIS

### **3.5.5 Error Detection**

1. The application shall not execute a user-requested action that is considered invalid. Instead an error message is displayed.  
Source: MS1472, MS1801, ESD-TR, JMCIS
2. When users make multiple errors with a single action, they are notified of each error.  
Source: MS1472, MS1801, JMCIS
3. When users make multiple errors with a single action, they will be provided with an immediate description of the error and the total number of additional errors detected, as in a word processing spell checker. There shall also be some means for the user to request and correct sequential display of error messages.  
Source: MS1801
4. Feedback is immediate, is visual and/or auditory, and explains the nature of the error.  
Source: MS1472, MS1801, JMCIS
5. When an error is repeated, feedback shows that an attempted correction was processed.  
Source: MS1472, MS1801, JMCIS
6. Users are required to correct only the invalid action and not to repeat the entire sequence.  
Source: MS1472, MS1801, JMCIS
7. After making a correction, users execute the same action for re-entry that was used originally.  
Source: MS1472, MS1801, JMCIS

### 3.5.6 General Undo Capability

1. Users can undo the most recent selection or action unless the selection or action was one requiring explicit destruction.  
Source: MS1472, MS1801, ESC-TR, JMCIS  
Developer Note: Developers may want to consider an "undo stack" in which a stack of selections or actions can be reversed. The decision to implement this functionality should be based on task analysis.
2. Undo can deselect objects, return to a prior state, and retrieve previous screen information.  
Source: MS1472, MS1801, ESC-TR, JMCIS
3. Irreversible actions (which cannot be undone) are labeled and clearly separated from those that are not.  
Source: JMCIS
4. If an action cannot be labeled as irreversible, the user shall be presented with a warning and asked to confirm the action which is irreversible.

## SECTION 4

### MENUS

#### 4.1 PULL DOWN MENUS

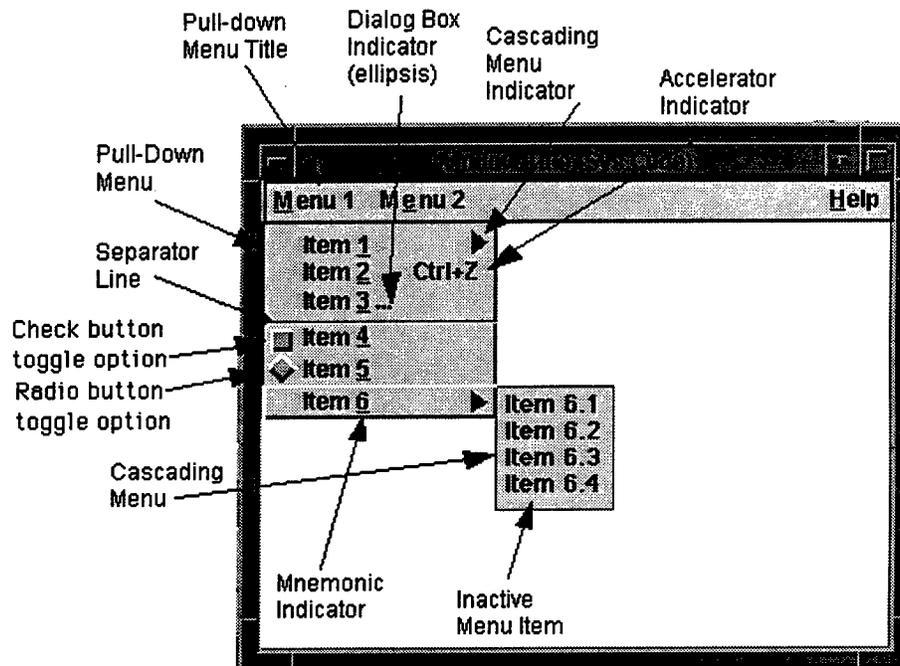
##### 4.1.1 Menu Title

1. The title of a pull down menu is displayed in a menu bar at the top of a window.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. A menu title describes the category or type of options and is different from other titles.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
3. The first letter of each word in the menu title is capitalized.  
Source: JMCIS
4. If the title contains an acronym, it is capitalized.  
Source: JMCIS

##### 4.1.2 Types of Menu Options

1. On any type of menu, a menu option that displays a window is followed by an ellipsis (see Figure 4-1).  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. A routing option that displays a cascading submenu is followed by a right-pointing arrow (see Figure 4-1).  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
3. Wording of an action toggle option reflects the action implemented when the option is selected.  
Source: JMCIS
4. Wording of an action toggle option is semantically congruent with natural usage.  
Source: JMCIS
5. When an action toggle is selected, its wording changes to reflect when the action can be selected again.  
Source: JMCIS
6. Only one of the actions for a toggle appears in the menu at any time.  
Source: JMCIS
7. Wording of an undo option changes dynamically to reflect the action to be undone.  
Source: JMCIS

8. Wording of a state toggle describes the state and may include radio/check buttons at the left (see Figure 4-1).  
Source: DODIIS, JMCIS
9. When a state toggle is selected, the button highlights without the wording changing.  
Source: DODIIS, JMCIS



**Figure 4-1. Types of Menu Options**

### 4.1.3 Wording, Organization, and Availability

1. Menu options are phrased to reflect the action executed and are worded in user vocabulary.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. The vocabulary in Table 4-1 is used when the actions in the table are included in an option.  
Source: MSG, AFSSC, JMCIS
3. Options are tersely worded and in upper/lowercase letters; the first letter is capitalized.  
Source: JMCIS

4. Acronyms are capitalized.  
Source: JMCIS
5. Each option is left-justified and appears on a single line.  
Source: JMCIS
6. The menu is wide enough for easy reading of the longest option and accelerator.  
Source: MSG, JMCIS
7. Menu options should be organized in logical or functional groupings.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
8. If the menu options are not in logical groups, order is by frequency of usage, with the most frequent at the top.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
9. If the menu options are not in logical groups or by frequency, options are in alphabetical/numerical order.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
10. Less frequently executed options and destructive options are at the bottom of the menu.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
11. If similar options are in different menus, the options are ordered in a consistent manner.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
12. A menu should contain no less than three options or more than ten options.  
Source: AFSSC, JMCIS  
Developer Note: In cases where many commands must be accommodated, developers should consider alternative methods such as combining menu options into a dialog window or using hierarchical menus. Other design alternatives might include the implementation of a "short" menu structure for novice users and a "long" menu structure for experienced users.
13. Menus with more than four options are divided into groups of four options. Groups of menu options are separated by a separator line.  
Source: JMCIS
14. If an option or set of options is never available to a user, the option(s) is/are not in a menu.  
Source: AFSSC, JMCIS
15. If an option is temporarily unavailable, it is displayed in the menu but dimmed.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS

**Table 4-1. Standard Mnemonics and Keyboard Accelerators**

Action	Mnemonic	Accelerator
Clear	E	----
Close	C	<Alt> <F4>
Context-Sensitive Help	C	<Shift> <Help>
Copy	C	<Ctrl> <C>
Cut	T	<Ctrl> <X>
Delete	D	----
Deselect All	---	<Ctrl> <I>
Exit	X	----
Help	H	----
Lower	L	<Alt> <F3>
Maximize	X	<Alt> <F10>
Minimize	N	<Alt> <F9>
Move	M	<Alt> <F7>
New	N	----
Open	O	----
Paste	P	<Ctrl> <V>
Print	P	----
Reselect All	---	<Alt> <Insert>
Restore	R	<Alt> <F5>
Save	S	----
Save As	A	----
Select All	---	<Ctrl> <A>
Size	S	<Alt> <F8>
Undo	U	<Ctrl> <Z>

#### 4.1.4 Mnemonics

1. Mnemonics are available for every title in a menu bar and every option in a menu.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. The mnemonics assigned to titles in a menu bar and to options in a menu are unique.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
3. A menu title or option has the same mnemonic whenever it appears in an application.  
Source: MSG, JMCIS
4. The mnemonics listed in Table 4-1 are used in menu titles and options.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
5. The same mnemonic is not used for options performing opposite or contradictory actions.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS

6. The similar key(s) is/are used in the mnemonic and keyboard accelerator for a menu option.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
7. The character assigned as the mnemonic is underlined.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
8. Whenever possible, the mnemonic is the first letter of a menu title or option.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
9. If the mnemonic is not the first letter, the mnemonic is another character in a menu title or option.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
10. If the mnemonic does not appear in a menu title or option, it is in parentheses after the label.  
Source: JMCIS
11. Mnemonics are not case-sensitive.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
12. If the location cursor is in the menu bar, typing a mnemonic displays the associated menu.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
13. When a menu is displayed, typing a mnemonic selects the associated option.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS

#### **4.1.5 Keyboard Accelerators**

1. Accelerators are available for frequently executed menu options.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. Accelerators listed in Table 4-1 are used for the actions listed.  
Source: MSG, AFSSC, JMCIS
3. Accelerators are right-justified, on the same line, and separate from the option label.  
Source: MSG, AFSSC, JMCIS
4. Users can execute keyboard accelerators available in the window with input focus.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
5. Keyboard accelerators containing an alphabetic character are not case-sensitive.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
6. The same key combinations are used for accelerators throughout the application/system.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
7. Key combinations for accelerators do not conflict with mnemonics/text entry keystrokes.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS

8. Alt+mnemonic for the menu title moves the location cursor to the menu bar.  
Source: MSG, JMCIS
9. Alt+mnemonic for the currently displayed option in an option menu displays the menu.  
Source: MSG, JMCIS
10. When an accelerator is typed, the associated menu is displayed briefly before the option is executed.  
Source: MSG, JMCIS

#### **4.1.6 Cascading Submenus**

1. Cascading submenus appear to the right of the parent menu and to the left if the space to the right is limited.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. Cascading submenus are limited to three levels.  
Source: AFSSC, JMCIS

#### **4.1.7 Pointing Device Navigation and Selection**

1. Spring-loaded and posted methods are used to display a menu and select an option.  
Source: MSG, JMCIS
2. When a menu is displayed, the location cursor is on the first available option in the menu.  
Source: MSG, JMCIS
3. Spring-loaded: Options highlight and submenus are displayed as the pointer is dragged over them.  
Source: MSG, JMCIS
4. Spring-loaded: Drag the location cursor to the option desired and release the S button to select.  
Source: MSG, JMCIS
5. Spring-loaded: Move the pointer off the menu and release the S button to not select an option.  
Source: MSG, JMCIS
6. Posted: Click the S button on the menu title and the menu remains displayed.  
Source: MSG, JMCIS
7. Posted: Click the S button on the option, the location cursor moves to the option and it is selected.  
Source: MSG, JMCIS
8. Posted: Move the pointer off the menu and click the S button to not select an option.  
Source: MSG, JMCIS

## **4.1.8 Keyboard Navigation and Selection**

1. F10 (and Shift+Menu) moves the location cursor to the first available menu title in a menu bar.  
Source: MSG, JMCIS
2. If none of the menu titles are available, these keys do not move the location cursor.
3. Left and Right move the location cursor between available menu titles, with wrapping.  
Source: MSG, JMCIS
4. F10 (and Shift+Menu) exits the menu bar and returns the location cursor to the previous object with focus.  
Source: MSG, JMCIS
5. Down displays the menu for the title containing the location cursor.  
Source: MSG, JMCIS
6. The arrow keys move the location cursor between available options in the menu.  
Source: MSG, JMCIS  
Developer Note: On the Sun model 5 keyboard, the numeric keypad cursor keys are used. The "inverted T" cursor keys do not move the location cursor.
7. Right displays a cascading submenu if the option with the location cursor is parent for the menu.  
Source: MSG, JMCIS
8. Return, Enter, or Space (and Select) selects an option and dismisses the menu.  
Source: MSG, JMCIS
9. Cancel dismisses the menu without making a selection.  
Source: MSG, JMCIS

## **4.2 TEAR-OFF MENUS**

### **4.2.1 Appearance**

1. A tear-off has a dashed line graphic which is the first menu option below the title.  
Source: MSG, JMCIS
2. The title of a tear-off menu window is the title of the associated pull down menu which is torn-off.  
Source: MSG, JMCIS
3. Options in a tear-off menu window are dimmed when unavailable.  
Source: MSG, JMCIS
4. Options in a tear-off menu window may change as selections are made in the menu window.  
Source: MSG, JMCIS

## **4.2.2 Navigation and Selection**

1. Users click the S button on a tear-off graphic in a menu to display a menu window.  
Source: MSG, JMCIS
2. Users drag tear-off graphics with the T button to display and move a menu window.  
Source: MSG, JMCIS
3. Users click the S button on an option in a menu window to select it and the window remains displayed.  
Source: MSG, JMCIS
4. Close (in Window Menu) and Cancel (on the keyboard) close a menu window.  
Source: MSG, JMCIS
5. When the menu is re-selected, the original menu window is dismissed and the new window appears.  
Source: MSG, JMCIS
6. With the cursor on the graphic, Return, Enter, or Space and Select displays the menu window.  
Source: MSG, JMCIS
7. Arrow keys move the location cursor between options; the same keys as above select an option.  
Source: MSG, JMCIS

## **4.3 POP-UP MENUS**

### **4.3.1 Appearance**

1. Pop-up menus should refrain from using cascading submenus so as not to further hide options from the user.  
Source: JMCIS
2. The options in a pop-up menu include mnemonics but not keyboard accelerators.  
Source: MSG, JMCIS  
Developer Note: The Motif™ Style Guide suggests that if pop-up menus are used they accommodate common functions. These common functions provide redundant access to actions and consequently have accelerators.
3. The options in a pop-up menu are dimmed when unavailable.  
Source: MSG, JMCIS
4. When a pointing device is used, the pop-up menu contents relates to the element with the pointer.  
Source: MSG, DODIIS, DODSG, JMCIS

5. When a keyboard is used, the pop-up menu contents relates to the element with the location cursor.  
Source: MSG, JMCIS
6. A pop-up menu appears near the element with which it is associated.  
Source: MSG, DODIIS, DODSG, JMCIS
7. A window containing a pop-up menu provides an indication that the menu is available.  
Source: MSG, JMCIS
8. A pop-up menu provides redundant access to actions and does not access new actions.  
Source: MSG, JMCIS

#### **4.3.2 Navigation and Selection**

1. Spring-loaded and posted methods are used with the M button to display a pop-up menu.  
Source: MSG, JMCIS
2. When a pop-up menu is displayed, the location cursor is positioned on the first available option in the menu.  
Source: MSG, JMCIS
3. Spring-loaded and posted methods used with the S and M buttons are display/ select in the pop-up menu.  
Source: MSG, JMCIS
4. Shift+F10 (and Menu) displays a pop-up menu.  
Source: MSG, JMCIS
5. Arrow keys move the location cursor between available options in a pop-up menu.  
Source: MSG, JMCIS
6. Return, Enter, or Space (and Select) selects an option and dismisses a pop-up menu.  
Source: MSG, JMCIS
7. When an option is selected with a pointing device/keyboard, the pop-up menu is dismissed.  
Source: MSG, JMCIS
8. Cancel and Shift+F10 (and Menu) dismisses a pop-up menu without making a selection.  
Source: MSG, JMCIS

### **4.4 OPTION MENUS**

#### **4.4.1 Appearance**

1. The options in an option menu include mnemonics and not keyboard accelerators.  
Source: JMCIS

#### **4.4.2 Navigation and Selection**

1. Spring-loaded and posted methods are used with the S button to display an option menu.  
Source: MSG, JMCIS
2. When an option menu is displayed, the location cursor is on the previously selected option.  
Source: MSG, JMCIS
3. Spring-loaded and posted methods used with the S button to navigate within and make selections in the option menu.  
Source: MSG, JMCIS
4. When an option is selected in an option menu, it appears as the label in the option menu button.  
Source: MSG, JMCIS
5. Space and Select displays an option menu.  
Source: MSG, JMCIS
6. Arrow keys move the location cursor between available options in an option menu.  
Source: MSG, JMCIS
7. Return, Enter, or Space and Select selects option and dismisses an option menu.  
Source: MSG, JMCIS
8. Cancel dismisses an option menu without making a selection.  
Source: MSG, JMCIS

## SECTION 5

### CONTROLS

#### 5.1 PUSH BUTTONS

##### 5.1.1 Appearance and Vocabulary

1. Push button labels are large enough for easy reading at normal viewing distances. There should be enough space between the label and the rectangle surrounding it so it will not restrict the legibility or visibility of the text or graphic in the push button.  
Source: AFSSC, JMCIS  
Developer Note: Kobara recommends a margin height of 2 pixels and a margin width of 8 pixels for push buttons.
2. All push buttons in a given window are the same size. This does not only provide a consistent look to a dialog window but, it provides a consistently sized target for users to select with the pointer.  
Source: JMCIS  
Developer Note: The default value of `XMNminimizeButtons` should be kept at `False`. This will insure that each Push Button has the same width as the widest one.
3. Push buttons are wide enough to display the longest button label or largest action icon.  
Source: MSG, AFSSC, JMCIS
4. Push button labels are short and unambiguous.  
Source: JMCIS
5. Action button labels describe the action, stated in active voice, taken by the application when the action button is selected.  
Source: MSG, JMCIS
6. When "All" is used in a push button label, there is no ambiguity as to reference.  
Source: JMCIS
7. Push button labels with multiple references include the name of the object/element.  
Source: JMCIS
8. Push buttons are located near the object(s) they affect.  
Source: MSG, JMCIS
9. The vocabulary in Table 5-1 is used in push button labels for the actions listed.  
Source: MSG, AFSSC, JMCIS
10. When new vocabulary is used, it describes actions not listed in Table 5-1.  
Source: MSG, AFSSC, JMCIS
11. The names of actions are congruent (e.g., save/delete, on/off, in/out).  
Source: MSG, AFSSC, JMCIS

12. The same vocabulary describes the same action throughout the application/system.  
Source: MSG, AFSSC, JMCIS

**Table 5-1. Action Vocabulary and Icons**

TERM	ACTION PERFORMED	ACTION ICON
<b>MANIPULATING PRIMARY WINDOWS</b>	These commands apply to windows where users can perform multiple actions (vice dialog windows where users usually perform a single action).	
Back	Moves a window to the back of the screen.	 Back
Close	Closes the current primary window and its secondary windows in an application and ends processing by the application.	
Exit	Closes all primary and secondary windows in an application and ends processing by the application.	
New	Opens a new window.	
Open	Opens an already-defined window.	 Open
Print	Initiates a process for printing the contents of a window (e.g., parts of a window, full window).	 Print
Save	Saves the contents of a window to a storage device.	
<b>MANIPULATING FILES AND DIRECTORIES</b>	These commands may be combined with the object of the command (e.g., Print File, Print Directory) if multiple commands and multiple objects are available in a window.	
Archive	Creates a backup copy of a file (e.g., on magnetic tape or fixed disk).	 Archive

**Table 5-1. Continued**

TERM	ACTION PERFORMED	ACTION ICON
Close	Closes a file; requests confirmation if unsaved changes have been made to the file and allows the user to save the changes.	
Delete	Removes a file from a storage device; requests confirmation prior to deletion.	
		Delete
Duplicate	Creates a copy of a file and prompts the user to name the file.	
New	Opens a new file.	
Open	Opens an existing file.	
		Open
Print	Initiates a process for printing the contents of a file.	
		Print
Restore	Retrieves the backup copy of a file and saves it to a storage device.	
Revert	Replaces the current file with the version that was most recently saved.	
Save	Saves a file to a storage device under the same file name; prompts the user for a name if the file does not have one.	
Save As	Saves a copy of a file under a new name; prompts the user for the new name.	
<b>EDITING TEXT OR GRAPHICS OBJECTS</b>		
Clear	Removes an object from a window without copying it to a clipboard buffer; does not compress the remaining space.	
		Clear
Copy	Duplicates an object to a clipboard buffer without deleting it from a window.	
		Copy

**Table 5-1. Continued**

TERM	ACTION PERFORMED	ACTION ICON
Cut	Removes an object from a window and stores it in a clipboard buffer.	 Cut
Delete	Removes an object from a window without copying it to a clipboard buffer; compresses the remaining space.	 Delete
Paste	Inserts an object from a clipboard buffer into a window at a selected location.	 Paste
Replace	Replaces a word or character string with a different word or character string entered by the user.	 Replace
Find	Locates an item (e.g., item in a list, word in a text area) that matches a character string entered by the user.	 Find
Spell Check	Compares the words in a file or text against a dictionary of recognized words and identifies entries not in the dictionary (e.g., misspelled words).	 Spell
Undo	Returns an object to its state before the last operation was performed.	 Undo
<b>MANIPULATING ITEMS</b>	"All" may be appended to these commands (e.g., Delete All) to indicate that the command applies to all items in a set of items.	
Add	Adds a new item to a set of items.	 Add
Compare	Displays information on multiple items in a set of items.	
Delete	Removes an item from a set of items.	 Delete

**Table 5-1. Continued**

<b>TERM</b>	<b>ACTION PERFORMED</b>	<b>ACTION ICON</b>
Describe	Displays a detailed explanation or description of an item.	
Deselect All	Deselects removes highlight from all items in a set of items.	
Edit	Edits an item in a set of items.	 Edit
Insert	Adds an item to a specific location within a set of items.	
Mark	Annotates (e.g., with an asterisk) that an item has been selected.	
Merge	Combines the contents of two items into a single item.	 Merge
Next	Displays the contents of the next item in a set of items.	
Select All	Selects (and highlights) all items in a set of items.	
Select On	Allows the user to select a subset of items based on criteria specified by the user.	
Sort	Sorts a set of items based on a variable selected by the user.	
Transmit	Transmits an item via a communication channel selected by the user.	 Trans
Unmark	Removes the annotation that an item has been selected.	
View	Displays the contents of an item.	
<b>CONSTRUCTING AND EXECUTING QUERIES</b>	These commands are used in database query commands where the user wants to retrieve a set of items based on specific criteria (e.g., data fields).	

**Table 5-1. Continued**

TERM	ACTION PERFORMED	ACTION ICON
Browse	Allows the user to navigate through the database prior to executing a query.	 Browse
Compile	Generates an executable version of the query and checks it for correctness.	
Modify	Allows the user to make changes to an existing query.	
Run	Executes the query.	
Save	Saves a query to a storage device, providing the query with a unique name that identifies it as a query.	
Select	Identifies the fields to include in the query.	
Show	Allows the user to define the manner in which the results of the query are to be displayed.	
<b>PAGING</b>		
First	Displays the first page of information.	 First
Next	Displays the next page of information.	 Next
Previous	Displays the previous page of information.	 Prev
Last	Displays the last page of information.	 Last
<b>PROCESSING</b>		
Go Back	Displays the previous transaction.	
Pause	Interrupts a process without changing data entries or control logic for the process.	

**Table 5-1. Continued**

<b>TERM</b>	<b>ACTION PERFORMED</b>	<b>ACTION ICON</b>
Restart	Turns on a process that has been turned off; if the process is already turned on when the command is issued, the process is turned off, then turned back on.	
Resume	Resumes a process that was previously paused (e.g., turns on a process that has been turned off).	
Continue	Resumes a process without changing data entries or control logic for the process.	
Retry	Causes a process to be attempted again.	
Review	Returns to the first display in a transaction sequence so that users can make changes if desired.	
Start	Begins or turns on a process.	
Stop	Ends or turns off a process at the next nondestructive breaking point.	
Suspend	Preserves the current transaction status when users log out of the system and permits resumption of work when users later log into the system.	
Update	Checks the status of a process and displays the updated information.	
Apply	Executes the control settings in a dialog window but does not close the window.	
Cancel	Closes a dialog window without executing the control settings in the window.	
<b>EXECUTING CONTROL SETTINGS IN DIALOG WINDOWS</b>		
Apply	Executes the control settings in a dialog window but does not close the window.	
Cancel	Closes a dialog window without executing the control settings in the window.	

**Table 5-1. Continued**

TERM	ACTION PERFORMED	ACTION ICON
Close	Closes a dialog window without executing the control settings in the window; used only in a dialog window when performing actions that are irreversible.	
OK	Executes the control settings in a dialog window and closes the window.	
Reset	Cancels any changes made to the control settings in a dialog window that have not been applied by the application, and restores the settings to the values they had when the window was opened.	
<b>EXECUTING OTHER DIALOG WINDOW ACTIONS</b>		
Help	Displays on-line information about an item or general information about a window.	
No	Indicates a negative response to a question posed and removes the window containing the questions.	
Yes	Indicates an affirmative response to a question posed and removes the window containing the question.	
<b>SYSTEM-LEVEL COMMANDS</b>		
Logout	Closes all windows on the screen and stops all processing by the system; requests confirmation if unsaved changes have been made and allows the user to save the changes.	
<b>MAP CONTROLS</b>		
Pan	Adjusts the longitude and/or latitude of a map display.	 Pan
Zoom	Moving the view of a map display inward or outward.	 Zoom

**Table 5-1. Concluded**

<b>TERM</b>	<b>ACTION PERFORMED</b>	<b>ACTION ICON</b>
Home	Returns the map display to a user-defined baseline position on a map.	
Previous View	Returns the map display to the map display that was previously displayed.	

---

### **5.1.2 Selection**

1. The S button on the pointing device is used to select a push button.  
Source: MSG, JMCIS
2. Space (and Select) selects a push button from the keyboard.  
Source: MSG, JMCIS
3. When a push button is selected, it highlights the action it represents is executed.  
Source: MSG, JMCIS

### **5.1.3 Default Push Buttons**

1. A default push button is available in each dialog window in an application.  
Source: AFSSC, JMCIS
2. The same push button is the default whenever a dialog window is displayed.  
Source: JMCIS
3. The default push button may vary depending on the object with focus in a window.  
Source: JMCIS
4. Default designation moves with the location cursor during keyboard navigation through push buttons.  
Source: MSG, JMCIS
5. Default designation returns to the original button when focus leaves the push button group.  
Source: MSG, JMCIS
6. OK and Yes are not the default push buttons if action executed by the button may be destructive.  
Source: MSG, AFSSC, JMCIS
7. Whenever possible, the default action is reversible.  
Source: JMCIS

### 5.1.4 Design of Action Icons

1. Action icons have unique graphic images so that users recognize the action performed. Action icons shall not conflict with the action icons in Figure 5-1.  
Source: JMCIS
2. Developers shall use a short text label in addition to a graphic for action icons (see Figure 5-1). This is especially important if the function being represented is highly abstract.  
Source: JMCIS  
Developer Note: An ellipsis is normally used to indicate that a push button or menu command presents a dialog box when selected. Since the space available for text labels on action icons is extremely limited, the ellipsis may be eliminated for action icons only.
3. Colors used in images in action icons are similar to other system colors and are used in a consistent manner.  
Source: JMCIS
4. Action icon graphics in an application are consistent with icons in other applications in the system and are consistent with the icons in Table 5-1 and Figure 5-1.  
Source: JMCIS
5. Graphics for action icons representing opposite actions are designed to mirror each other.  
Source: JMCIS
6. Graphics are presented in a common style and oriented consistently within the button.  
Source: JMCIS



**Figure 5-1. Action Icons with Labels**

### 5.2 RADIO BUTTONS

1. Radio buttons are used in groups to select one from multiple mutually exclusive options.  
Source: MSG, DODIIS, AFSSC, JMCIS
2. Radio buttons are the same size whenever they appear in a window.  
Source: JMCIS
3. The S button on the pointing device is used to select a radio button.  
Source: MSG, DODIIS, AFSSC, JMCIS

4. Space (and Select) selects a radio button from the keyboard.  
Source: MSG, JMCIS
5. When a radio button is selected, it is highlighted and any other selected button is deselected.  
Source: MSG, DODIIS, AFSSC, JMCIS
6. If a radio button is in a window with a default action, Enter/Return executes the action.  
Source: MSG, JMCIS

### **5.3 CHECK BUTTONS**

1. A check button is a non-exclusive setting; selecting one toggles a setting or state.  
Source: MSG, DODIIS, AFSSC, JMCIS
2. Check buttons are used singly or in related groups.  
Source: MSG, DODIIS, AFSSC, JMCIS
3. Check buttons are the same size whenever they appear in a window.  
Source: JMCIS
4. The S button on the pointing device is used to select a check button.  
Source: MSG, DODIIS, AFSSC, JMCIS
5. Space (and Select) selects a check button from the keyboard.  
Source: MSG, JMCIS
6. When a check button is selected, it is highlighted and any other button which has been previously selected stays selected.  
Source: MSG, DODIIS, AFSSC, JMCIS
7. If a check button is in a window with a default action, Enter/Return executes the action.  
Source: MSG, JMCIS

### **5.4 LIST BOXES**

#### **5.4.1 Appearance**

1. The items in a list are displayed vertically, with one item per line.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. The title of the list describes its purpose or contents and appears above the box.  
Source: MSG, JMCIS
3. A vertical scroll bar appears to the right of the list when items exceed space available.  
Source: MSG, JMCIS

4. A list scrolls only in response to user action and does not scroll automatically.  
Source: MSG, JMCIS
5. A list is wide enough to read the items without having to scroll horizontally.  
Source: AFSSC, JMCIS
6. List items appear in sequential order based on the nature of items and sequence expected.  
Source: AFSSC, JMCIS
7. Items added to a list appear in their correct position in the list, not at the end of the list.  
Source: AFSSC, JMCIS

#### **5.4.2 Navigation and Selection**

1. Users search a list by moving the scroll bar slider until the item appears.  
Source: MSG, AFSSC, JMCIS
2. Speed search: Type first letter of item; list scrolls to first instance with that letter.  
Source: JMCIS  
Developer Note: To incorporate the speed search feature a function must be written. Capture keyboard press events on the scrolled list by writing an event handler (XtAddEvent Handler) for keypress events (KeyPressMask).
3. Incremental search: Type the first few letters; list scrolls to first match.  
Source: JMCIS  
Developer Note: To incorporate the incremental search feature a callback function must be written for the text field so that each time the user presses a key, the callback searches the list to find the closest match and highlights that match. When an incremental search is used for each keypress, the Return key is not needed to execute the function.
4. Speed search and incremental search shall not be case-sensitive. If case-sensitivity is a user requirement, then this information is provided to users.  
Source: JMCIS
5. If a Motif selection box is used, it behaves as in an incremental search.  
Source: JMCIS  
Developer Note: To incorporate the incremental search feature a callback function must be written for the text field so that each time the user presses a key the callback searches the list to find the closest match and highlights that match. When an incremental search is used for each keypress, the Return key is not needed to execute the function.
6. The S button on the pointing device is used to select item(s) in a list box.  
Source: MSG, AFSSC, JMCIS
7. Space (and Select) selects item(s) from the keyboard.  
Source: MSG, JMCIS
8. If a window has a default action, double clicking on an item chooses the item and executes the action.  
Source: MSG, JMCIS

## 5.5 SCROLL BARS

1. Users are able to scroll to the top or the bottom of the information but not beyond Scroll bar components, actions and responses shall comply with Figure 5-2.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. Relative slider position indicates relative position of information displayed in the window.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
3. Pressing the S button on a stepper arrow moves one unit in the arrow direction.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
4. Pressing the S button on a trough moves one page (less one unit) in the direction indicated.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
5. Dragging the slider with the S button moves the slider in the pointer direction.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
6. Pressing the T button on the trough moves the slider to the pointer position.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
7. Dragging the T button on the trough moves the slider to the pointer position, with pointer movement.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
8. Cancel returns the slider to its position before the sliding operation began.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
9. Dragging past the top/bottom of the scrollable area makes the window scroll in the pointer direction.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
10. The speed of autoscrolling is the same as when the users press on a stepper arrow.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
11. Autoscrolling stops when the pointer is moved into or outside the window stop drag action.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
12. Arrow keys move the slider one unit (e.g., one line or column) in the arrow direction.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
13. Ctrl with the arrow keys move the slider one large increment in the arrow direction.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
14. PageUp, PageDown, PageRight, and PageLeft page the screen in the specified direction.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
15. Ctrl+Begin and Ctrl+End scroll to beginning/end of scrollable region.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS

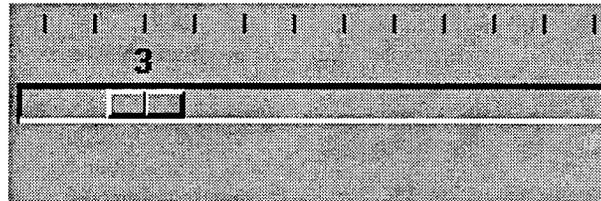
<u>Component</u>	<u>Action</u>	<u>Response</u>
Stepper Arrow →	← Click S button	View moves up one unit (e.g., line-by-line)
Trough →	← Click S button	View moves up one window full
Slider →	← Press and Drag S button	View moves relative to the position in the file where the top of the slider is the beginning of the file and the bottom of the slider is the end of the file
Trough →	← Click T button	View jumps to relative position in file indicated by position of pointer
Trough →	← Click S button	View moves down one window full
Stepper Arrow →	← Click S button	View moves down one unit (e.g., line-by-line)

**Figure 5-2. Components, Actions, and Responses of a Scroll Bar**

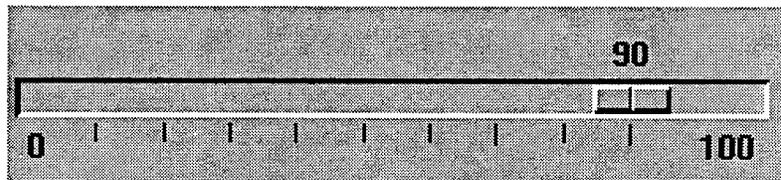
## 5.6 SCALES

1. A scale contains tick marks and is labeled with minimum/maximum values for the scale.  
Source: MSG, DODSG, JMCIS  
Developer Note: Tick marks are not a part of the scale widget and must be added using a label widget. It is not recommended that labels be made children of the scale because tick marks will not appear adjacent to the trough (see Figure 5-3). Instead, it is suggested that label widgets be used and placed in a form widget. The scale and the label widgets are both attached to the form (see Figure 5-4).
2. Pressing the S button on the scale bar moves one large increment at a time in the direction indicated.  
Source: MSG, JMCIS
3. Dragging the slider with the S button moves the slider in the pointer direction.  
Source: MSG, JMCIS
4. Pressing the T button on the trough moves the slider to the pointer position.  
Source: MSG, JMCIS

5. Dragging the T button on the trough moves the slider to the pointer position with the pointer movement.  
Source: MSG, JMCIS
6. Cancel returns the slider to its position before the sliding operation began.  
Source: MSG, JMCIS
7. Arrow keys move the slider one unit in the arrow direction.  
Source: MSG, JMCIS
8. Ctrl with the arrow keys move the slider one large increment in the arrow direction.  
Source: MSG, JMCIS
9. Ctrl+Begin and Ctrl+End move the slider to minimum/maximum scale values.  
Source: MSG, JMCIS



**Figure 5-3. Non-Preferred Scale**  
(Label widget is a child of the scale widget)



**Figure 5-4. Preferred Scale**  
(Label widget and scale widget are placed in a form widget)

## **5.7 STANDARD AND NONSTANDARD CONTROLS**

1. All of the controls in a window are identifiable solely on the basis of their appearance.  
Source: JMCIS
2. All controls with the same function have the same appearance.  
Source: JMCIS
3. Controls that are similar in shape have distinctive visual cues.  
Source: JMCIS
4. Text/graphics in a window are clearly different in appearance from standard controls.  
Source: JMCIS
5. If a nonstandard control is used, it has as much of the standard look and feel as possible.  
Source: JMCIS  
Developer Note: Nonstandard controls should maintain a three-dimensional appearance since they can be manipulated by the user.

### **5.7.1 Modifying Push Button Behavior**

1. When push buttons are used to execute an action and provide an indicator of the action selected, the push button can be modified so that it stays highlighted.  
Source: JMCIS
2. A push button palette is used to provide access to a set of frequently performed actions.  
Source: JMCIS
3. Push buttons in a palette represent a set of mutually exclusive options.  
Source: JMCIS

### **5.7.2 Using Pop-up Lists to Support Text Entry**

1. Pop-up lists are used to fill a text field when the number of valid entries in the field is limited.  
Source: JMCIS  
Developer Note: See also Section 9.2.1 #20.
2. The availability of a pop-up list is indicated by a push button next to the text field.  
Source: JMCIS
3. Items in a pop-up list allow users to select from valid entries or cancel the selection.  
Source: JMCIS
4. Pop-up lists are wide enough to read items in the list and include scroll bars if necessary.  
Source: JMCIS

## SECTION 6

### WINDOWS

#### 6.1 TYPES OF WINDOWS

The following types of windows are addressed: Primary Windows, Secondary Windows, and Dialog Windows. The Bellcore *Graphical User Interface Design Guidelines for Bellcore Software Products* takes the Motif definition of a primary window and further defines; an Application Primary Window and a Primary Task Window. Bellcore also divides secondary windows into Menubar Secondary Task Windows and Pushbutton Secondary Task Windows. Dialog Windows are generally defined as Prompt Windows and Message Windows.

##### 6.1.1 Primary Windows

Applications can be designed around one primary window or one primary window and several primary task windows. When an application addresses a single top-level task, one application primary window shall be used. When an application addresses several top-level tasks an application primary window and several primary task windows shall be used. The following design rules pertaining to primary windows are derived primarily from the Bellcore *Graphical User Interface Design Guidelines for Bellcore Software Products*.

###### 6.1.1.1 Application Primary Window

An application primary window shall provide application control. If only one application primary window is used, the application primary window shall provide access to the application top-level tasks. If an application primary window is used in conjunction with several primary task windows, the application primary window shall provide application control and management of primary task windows.

1. The application primary window shall be the first window displayed when an application is launched.  
Source: Bellcore  
Developer Note: An application primary window shall be implemented as type ApplicationShell.
2. An application primary window cannot be Closed but may be iconified. Close shall not appear in the window menu of an application primary window.  
Source: Bellcore
3. When an application primary window is iconified, all of its secondary task windows or dialog boxes are also iconified.  
Source: Bellcore
4. The application primary window must be the only window that contains an Exit function. The Exit function shall be located in the Application menu or the File menu of the menubar (see item 7 below).  
Source: Bellcore

5. An application primary window must contain the following elements: Window Menu Control, Title Bar, Title, Minimize Control, Maximize Control, Menubar, Resize Borders, and Standard Menus.  
Source: MSG, Bellcore
6. If the application primary window is the only primary window in an application then the following standard menus shall be included in a menubar: File, Edit, and Help. If the application primary window is used in conjunction with primary task windows then an Application Menu with the same name as the application and a Help menu shall be included in the menubar.  
Source: Bellcore
7. An application primary window must have a standard Motif window menu with the following options: Restore, Move, Size, Minimize, Maximize, and Lower. The window menu shall not have a Close item. Mnemonics are required and accelerators are optional (see Figure 6-1).  
Source: Bellcore

#### **6.1.1.2 Primary Task Window**

The primary task window provides primary working areas for data display and manipulation of top-level tasks.

1. A primary task window is used to display primary data and controls for a top-level task.  
Source: Bellcore  
Developer Note: A primary task window shall be implemented as a TopLevelShell.
2. A primary task window may be Closed or Iconified independently from other primary task windows and the application primary window.  
Source: Bellcore
3. When a primary task window is iconified, all of its secondary task windows or dialog boxes are also iconified. When a primary task window is iconified processing in the window continues.  
Source: MSG, DODIIS, JMCIS, Bellcore
4. When a primary task window is closed, processing in it stops.  
Source: MSG, DODIIS, JMCIS, Bellcore
5. A primary task window shall not contain an Exit function and the application shall not be shut down via a primary task window.  
Source: Bellcore
6. A primary task window must contain the following elements: Window Menu Control, Title Bar, Title, Minimize Control, Maximize Control, Menubar, Resize Borders and Standard Menus (File, Edit, Help).  
Source: MSG, Bellcore

7. A primary task window must have a standard Motif window menu with the following options: Restore, Move, Size, Minimize, Maximize, Lower, and Close. Mnemonics are required and accelerators are optional (see Figure 6-1).  
Source: MSG, Bellcore

<b><i>Window Menu</i></b>	<p>A window menu is used to display a list of window actions. The window menu button is located in the upper-left corner of every window. Pressing the window menu button activates the menu and presents the following options: Restore, Move, Size, Minimize, Maximize, Lower, and Close.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">☐</td> <td></td> </tr> <tr> <td>Restore</td> <td>Alt + F5</td> </tr> <tr> <td>Move</td> <td>Alt + F7</td> </tr> <tr> <td>Size</td> <td>Alt + F8</td> </tr> <tr> <td>Minimize</td> <td>Alt + F9</td> </tr> <tr> <td>Maximize</td> <td>Alt + F10</td> </tr> <tr> <td>Lower</td> <td>Alt + F3</td> </tr> <tr> <td>Close</td> <td>Alt + F4</td> </tr> </table>	☐		Restore	Alt + F5	Move	Alt + F7	Size	Alt + F8	Minimize	Alt + F9	Maximize	Alt + F10	Lower	Alt + F3	Close	Alt + F4
☐																	
Restore	Alt + F5																
Move	Alt + F7																
Size	Alt + F8																
Minimize	Alt + F9																
Maximize	Alt + F10																
Lower	Alt + F3																
Close	Alt + F4																
<b><u>Restore</u></b>	The <b>Restore</b> option restores the minimized or maximized window to the previous size and location.																
<b><u>Move</u></b>	The <b>Move</b> option moves a window around the work space.																
<b><u>Size</u></b>	The <b>Size</b> option changes the height and width of the window in the direction indicated by the pointer.																
<b><u>Minimize</u></b>	The <b>Minimize</b> option changes a window into an icon.																
<b><u>Maximize</u></b>	The <b>Maximize</b> option enlarges a window to its maximum size.																
<b><u>Lower</u></b>	The <b>Lower</b> option moves a window to the bottom of the window hierarchy.																
<b><u>Close</u></b>	The <b>Close</b> option closes a window and removes it from the workspace.																

Figure 6-1. Window Menu and Window Menu Options

## **6.1.2 Secondary Windows**

Secondary windows are optional and should be used for short-term interaction with data and controls that support the primary task of a primary task window or an application primary window.

1. When a secondary window is opened, it appears in front of the parent which stays displayed.  
Source: MSG, DODIIS, JMCIS, Bellcore  
Developer Note: A secondary window shall be implemented as a TransientShell.
2. When a secondary window is closed, its children are closed but its parent is not affected.  
Source: MSG, DODIIS, JMCIS
3. A secondary window shall not shut down an application and shall not have an Exit function.  
Source: Bellcore
4. A secondary window must not be opened at the application startup.  
Source: Bellcore

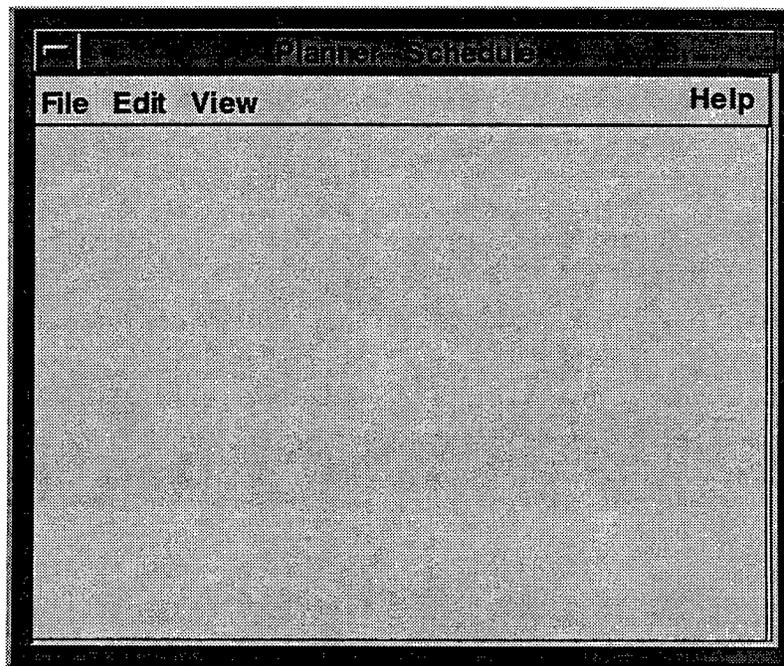
### **6.1.2.1 Menubar Style Secondary Window**

1. A menubar style secondary window shall be chosen when five or more user operations (excluding Close and Help) are performed (see Figure 6-2).  
Source: Bellcore
2. A menubar style secondary window shall be chosen when Edit operations such as cut, copy, and paste are required.  
Source: Bellcore
3. A menubar style secondary window shall be chosen when File operations such as New, Open, and etc. are required.  
Source: Bellcore
4. A menubar style secondary task window shall have a menubar with File and Help menus and may have an Edit menu.  
Source: Bellcore

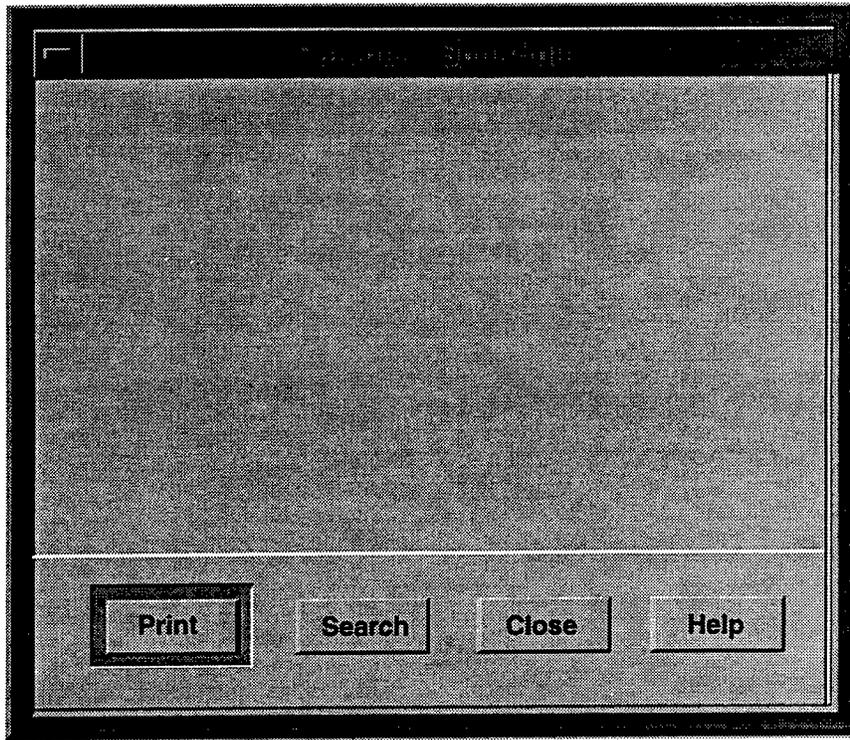
### **6.1.2.2 Push Button Style Secondary Window**

1. A push button style secondary window shall be chosen when five or fewer user operations (excluding Close and Help) are performed (see Figure 6-3).  
Source: Bellcore
2. A push button style secondary window shall be chosen when Edit operations such as cut, copy, and paste are not required.  
Source: Bellcore
3. A push button style secondary window shall be chosen when File operations such as New, Open, and etc. are not required.  
Source: Bellcore

4. A push button style secondary window shall not contain a menubar but shall contain a control area at the bottom of the window set off by a separator.  
Source: Bellcore
5. The control area in a push button style secondary window shall contain no more than seven push buttons including Close and Help.  
Source: Bellcore
6. The control area in a push button style secondary window shall contain a close push button control that allows the user to dismiss the window and a Help push button control that provides access to help on secondary window topics.  
Source: Bellcore



**Figure 6-2. Menubar Style Secondary Window**



**Figure 6-3. Push Button Style Secondary Window**

### **6.1.3 Dialog Windows**

Dialog windows are temporary windows used to communicate with the user. They are the system's only means of communicating directly with the user for a specific purpose. Two types of dialog windows are defined below: the prompt window and the message window.

1. A dialog window shall contain the following elements: a window menu control, a title area, a title, a message area, and a control area. No minimize or maximize controls or resize borders shall be a part of a dialog window.  
Source: MSG, Bellcore  
Developer Note: A dialog window shall be implemented as type XmDialogShell.
2. A dialog window shall not waste screen space and shall be just large enough to contain data and controls.  
Source: Bellcore
3. The title of a dialog window must indicate the content of the dialog window, e.g., Login, Warning, etc.  
Source: Bellcore
4. Window menus in dialog windows shall only contain the Move option.

### 6.1.3.1 Prompt Windows

1. An application shall present a prompt windows when requesting information to continue processing.  
Source: MSG, DODSG, AFSSC, JMCIS  
Developer Note: The Prompt Dialog is a special form of the SelectionDialog. By default, this dialog allows the user to type a text string and then enter it by selecting the OK button or by pressing the return key. Unfortunately, the TextField widget of the predefined Motif widgets does not receive keyboard focus by default. Developers should use the XMProcessTraversal() to set the focus to the TextField widget in a prompt window. In MOTIF 1.2 the XmNinitialFocus resource was introduced and can be used on both MessageDialogs and SelectionDialogs to specify the textfield widget that has the keyboard focus the first time the dialog window pops up.
2. A prompt window is application modal and interrupts processing by the application.  
Source: MSG, DODSG, AFSSC, JMCIS
3. A prompt window includes a message stating what information is needed and a text field for typing.  
Source: MSG, DODSG, AFSSC, JMCIS
4. The title of a prompt window indicates the process/application generating the prompt.  
Source: MSG, DODSG, AFSSC, JMCIS
5. The message in a prompt window is phrased in language that is meaningful to users.  
Source: MSG, DODSG, AFSSC, JMCIS
6. A prompt window shall contain one of the following push button arrangements (in the order indicated):  
  
OK Help  
OK Cancel Help  
OK Apply Cancel  
OK Apply Cancel Help  
OK Apply Reset Cancel  
OK Apply Reset Cancel Help  
Source: MSG

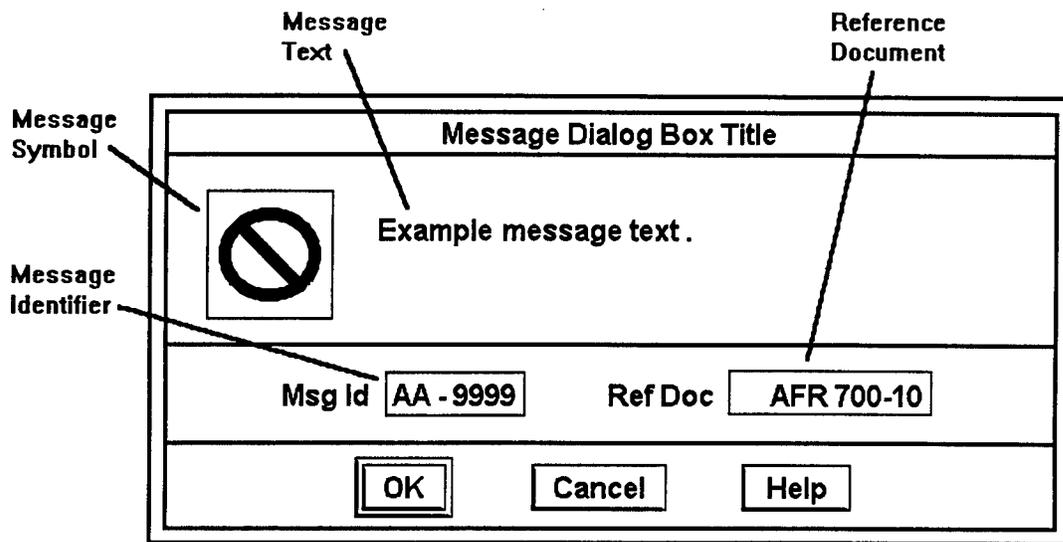
### 6.1.3.2 Message Windows

Developer Note: All message windows shall use a DialogShell widget. Using this widget will automatically enforce the behaviors defined for message windows. Using a DialogShell widget will not allow message windows to be iconified. Additionally, the DialogShell widget will always place the message window on top of the shell widget that owns the parent of the new dialog and when the parent is iconified, the message window shall also be iconified. To create a message dialog create a pop-up widget of type XmDialogShellWidgetClass using XmCreateMessageBox. A widget of type XmMessageBoxWidgetClass is created as its child. The XmNdialogType resource for the dialog should then be set to define the type of message dialog (XmDIALOG\_ERROR, XmDIALOG\_INFORMATION, XmDIALOG\_MESSAGE, XmDIALOG\_QUESTION, XmDIALOG\_WARNING, or XmDIALOG\_WORKING).

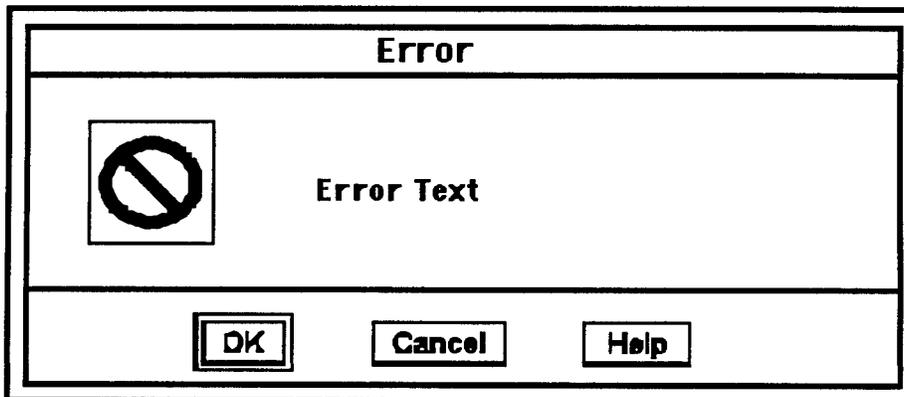
1. A message window is as small as possible and large enough to display information required.  
Source: MSG, DODSG, AFSSC, JMCIS
2. A message window has a unique appearance and appears at a standard location. This location shall be on top of its parent window.  
Source: MSG, DODSG, AFSSC, JMCIS
3. A message window includes title, symbol for the type, message, and one/more push button(s) (see Figure 6-4).  
Source: MSG, DODSG, AFSSC, JMCIS
4. The title of the message window indicates the process/application generating the message.  
Source: MSG, DODSG, AFSSC, JMCIS
5. The message itself is meaningful to users and requires no documentation or translation.  
Source: MSG, DODSG, AFSSC, JMCIS
6. Error messages focus on the procedure for correcting the error, not the cause of the error.  
Source: MSG, DODSG, AFSSC, JMCIS
7. For a repeated error, the message includes recommendations for preventive actions.  
Source: MSG, DODSG, AFSSC, JMCIS
8. Message identifiers may be used to provide a clear and unique identification for application messages. Message identifiers shall be displayed below the message text and to the right of the reference document label as in Figure 6-3.  
Source: AFSSC
9. If message identifiers are supplied, a reference document shall also be displayed.  
Source: AFSSC
10. Reference documents shall be displayed to the right of the message identifier as in Figure 6-4.  
Source: AFSSC

### **Error Message Windows**

1. An application informs users in an error window when an error occurs.  
Source: MSG, DODSG, AFSSC, JMCIS
2. The window has a symbol, message, and OK/Cancel/Help push buttons (see Figure 6-5).  
Source: MSG, DODSG, AFSSC, JMCIS
3. An error window interrupts processing by the application.  
Source: MSG, DODSG, AFSSC, JMCIS



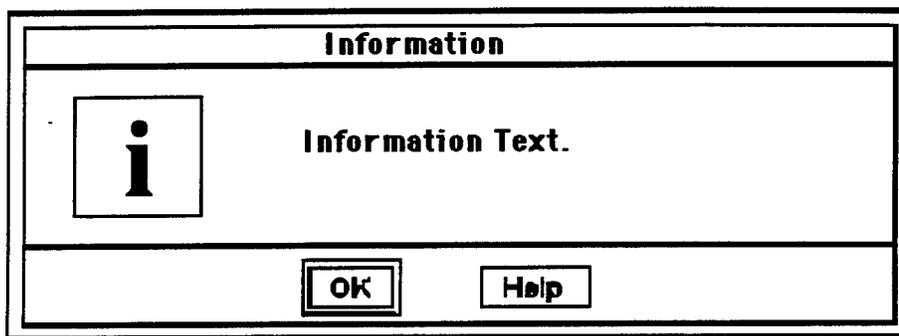
**Figure 6-4. Basic Message Window**  
 (from the Air Force Standard System Center  
 Graphical User Interface Standards (SSC Reg 700-10))



**Figure 6-5. Error Message Window**  
 (adapted from the Air Force Standard System Center  
 Graphical User Interface Standards SSC Reg 700-10)

## Information Message Windows

1. An application conveys noncritical information to users in an information window.  
Source: MSG, DODSG, AFSSC, JMCIS
2. The window has a symbol, message, OK/Help push buttons (see Figure 6-6).  
Source: MSG, DODSG, AFSSC, JMCIS
3. An information window does not interrupt processing by the application.  
Source: MSG, DODSG, AFSSC, JMCIS
4. An application does not use timed-information window, then resume processing on its own.  
Source: MSG, DODSG, AFSSC, JMCIS



**Figure 6-6. Information Message Window**  
(from the Air Force Standard System Center  
Graphical User Interface Standards SSC Reg 700-10)

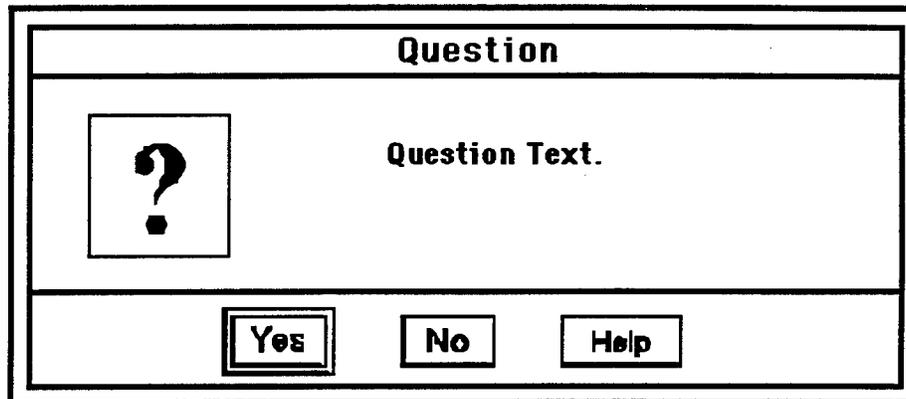
## Question Message Windows

1. An application requests clarification of a previous user response in a question window.  
Source: MSG, DODSG, AFSSC, JMCIS
2. The window has symbol, message, Yes/No/Help or Yes/No/Cancel/Help push buttons (see Figure 6-7).  
Source: MSG, DODSG, AFSSC, JMCIS
3. A question window suspends processing by the application.  
Source: MSG, DODSG, AFSSC, JMCIS

## Warning Message Windows

1. An application presents critical information on user actions in a warning window.  
Source: MSG, DODSG, AFSSC, JMCIS

2. Application displays a warning window when users attempt a destructive action.  
Source: MSG, DODSG, AFSSC, JMCIS
3. The window has symbol, message, and Yes/No/Help or OK/Cancel/Help push buttons (see Figure 6-8).  
Source: MSG, DODSG, AFSSC, JMCIS
4. A warning window suspends processing by the application.  
Source: MSG, DODSG, AFSSC, JMCIS

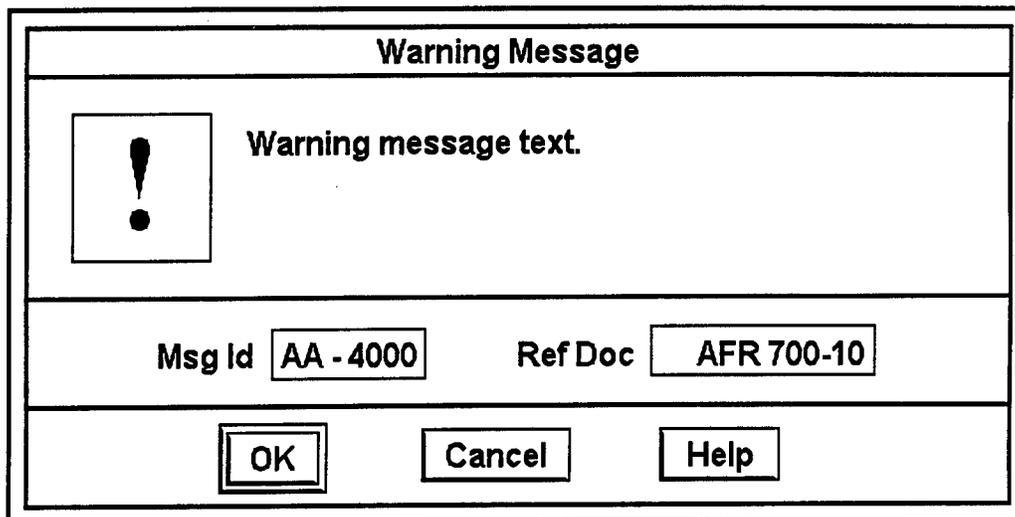


**Figure 6-7. Question Message Window**  
(from the Air Force Standard System Center  
Graphical User Interface Standards SSC Reg 700-10)

### **Working Message Windows**

1. An application displays a working window when processing time is over 5 seconds.  
Source: MSG, DODSG, AFSSC, JMCIS
2. A working window has a working symbol, message, and OK/Pause/Continue/Cancel/Help push buttons (see Figure 6-9).  
Source: MSG, DODSG, AFSSC, JMCIS
3. During lengthy processing, in excess of 15 seconds a working window provides an update bar and is updated to indicate status of processing.  
Source: MSG, DODSG, AFSSC, JMCIS
4. A working window does not interrupt processing by the application.  
Source: MSG, DODSG, AFSSC, JMCIS
5. The window stays displayed until the action is complete, or the window doing the action is iconified, or the user presses cancel.  
Source: MSG, DODSG, AFSSC, JMCIS

6. When processing is complete, the working window is removed (without user action).  
Source: MSG, DODSG, AFSSC, JMCIS
7. Users can cancel operation in progress with confirmation required if unsaved data is lost.  
Source: MSG, DODSG, AFSSC, JMCIS

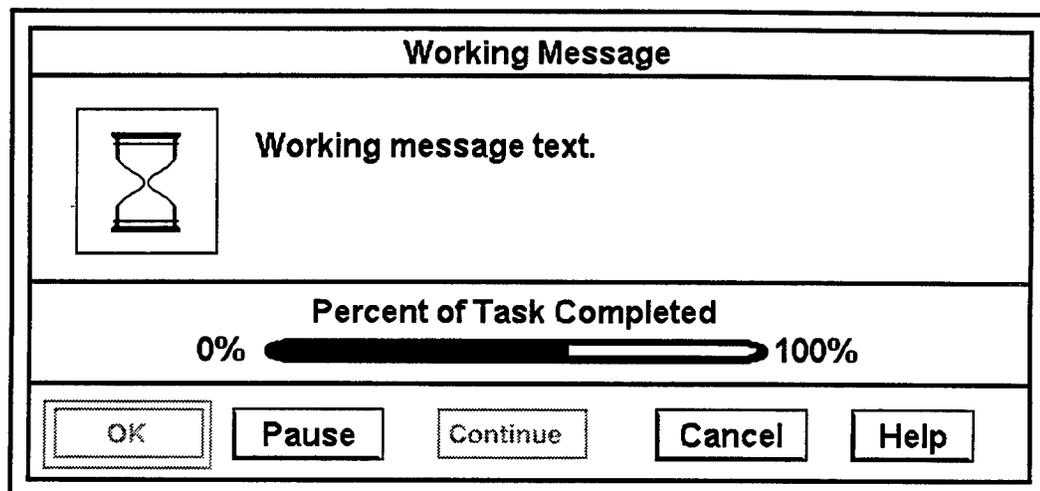


**Figure 6-8. Warning Message Window**  
(from the Air Force Standard System Center  
Graphical User Interface Standards SSC Reg 700-10)

## 6.2 WINDOW STATES

1. A window is in the open state when it is on the screen. Multiple windows may be open at any one time.  
Source: MSG, JMCIS
2. A window shall be active when it has input focus.  
Source: MSG, JMCIS
3. A window has input focus when it first appears on the screen.  
Source: MSG, JMCIS
4. When a window is iconified it shall be replaced by an icon and any processing that was occurring in the window continues.  
Source: MSG, DODIIS, DODSG, JMCIS

5. When a window is closed it is removed from the screen and processing that was occurring in the window stops. Exceptions include: windows where background processes, message transmission, and database updates are occurring.  
Source: MSG, JMCIS
6. When a window with input focus is closed, users shall explicitly select another window to have focus. An application shall not assign focus.  
Source: MSG, JMCIS



**Figure 6-9. Working Message Window**  
(from the Air Force Standard System Center  
Graphical User Interface Standards SSC Reg 700-10)

## 6.3 WINDOW MANAGEMENT FUNCTIONS

### 6.3.1 Pointing Device Interaction

1. When a window is closed and then reopened, it is displayed where it was when it was closed.  
Source: MSG, JMCIS
2. To move a window, users can select the Move option in Window Menu, then drag the window to new location. An outline of the window moves on the screen as a user moves the pointer.  
Source: MSG, JMCIS

3. Users press the S or T button then drag the window to the new location. An outline of the window moves on the screen as a user moves the pointer.  
Source: MSG, JMCIS
4. Users select the Size option in the Window Menu, then drag the frame to the new size. An outline of the window moves on the screen as a user moves the pointer.  
Source: MSG, JMCIS
5. Users press the S or T button when the cursor is over the window frame, then drag it to the new size. An outline of the window moves on the screen as a user moves the pointer.  
Source: MSG, JMCIS
6. Users select the Minimize option in the Window Menu. The window is iconified, and the icon appears in the lower left corner of the screen.  
Source: MSG, DODIIS, DODSG, JMCIS
7. Users select the Minimize button on the title bar. The window is iconified, and the icon appears in the lower left corner of the screen.  
Source: MSG, DODIIS, JMCIS
8. Users double click the S button on an icon to restore a window that has been iconified.  
Source: MSG, JMCIS
9. Users select the Maximize option in the Window Menu and the window expands to its full size.  
Source: MSG, DODIIS, JMCIS
10. Users select the Maximize button on the title bar and the window expands to its full size.  
Source: MSG, DODIIS, JMCIS
11. Users click on the title bar to raise the window to the front of screen and give it input focus.  
Source: MSG, DODIIS, JMCIS
12. Users select the Lower option in the Window Menu to move the window to the bottom of the hierarchy.  
Source: MSG, DODIIS, JMCIS
13. Users select the Close option in the Window Menu and the window is closed. Users are prompted to save any unsaved data.  
Source: MSG, DODIIS, JMCIS
14. Users double click on the Window Menu button and the window is closed. Users are prompted to save any unsaved data.  
Source: MSG, DODIIS, JMCIS

### **6.3.2 Keyboard Interaction**

1. Shift+Escape or Alt+Space displays the Window Menu.  
Source: MSG, DODIIS, JMCIS

2. Navigation and selection in the window menu is done as in a pull down menu.  
Source: MSG, DODIIS, JMCIS

#### **6.4 WINDOW ICONS**

1. An icon has the same title as its corresponding window.  
Source: MSG, DODSG, JMCIS
2. An icon title is the same width as the icon image; the image may be truncated to fit.  
Source: MSG, DODSG, JMCIS
3. The location cursor appears on the icon with input focus, and the full icon title is displayed.  
Source: MSG, DODSG, JMCIS
4. When an icon loses input focus, the title is truncated to the same width as the icon image.  
Source: MSG, DODSG, JMCIS
5. The Icon Menu has the same options (except Size) as Window Menu for the corresponding window.  
Source: MSG, DODSG, JMCIS
6. Minimize is included in an Icon Menu but is not available for selection.  
Source: MSG, DODSG, JMCIS
7. Users click the S button on the icon to display the Icon Menu.  
Source: MSG, DODSG, JMCIS
8. Users dismiss the Icon Menu by clicking the S button anywhere outside the menu.  
Source: MSG, DODSG, JMCIS
9. The default location for icons is the lower left corner of the screen. An icon box may be used to organize and reduce screen clutter.  
Source: MSG, DODSG, JMCIS
10. If more than one window is iconified, the icons are arrayed in rows from left to right.  
Source: MSG, DODSG, JMCIS
11. An option to change the default icon location may be available as a user preference setting.  
Source: MSG, DODSG, AFSSC, JMCIS

## SECTION 7

### SYSTEM-LEVEL WINDOWS

#### 7.1 SYSTEM LOGIN

1. Users complete a login procedure before the system functions can be accessed.  
Source: MSG, DODIIS, DODSG, JMCIS
2. A system makes available only the applications to which a user is allowed access to.  
Source: MSG, DODIIS, DODSG, JMCIS
3. If appropriate, users also complete a login for individual or groups of applications.  
Source: MSG, DODIIS, DODSG, JMCIS
4. If the system is unavailable, a message appears indicating the system status and when the system is available.  
Source: MSG, DODIIS, DODSG, JMCIS
5. A login window appears on the screen when users begin a session on a system.  
Source: MSG, DODIIS, DODSG, JMCIS
6. A login window contains two text fields for entering user identification and password.  
Source: MSG, DODIIS, DODSG, JMCIS
7. The text fields do not provide clues as to the number of characters required.  
Source: MSG, DODIIS, DODSG, JMCIS
8. The appearance and behavior of objects in the login window is consistent with Figure 7-1.  
Source: MSG, DODIIS, DODSG, JMCIS
9. Users enter a valid identification and password before a session is initiated.  
Source: MSG, DODIIS, DODSG, JMCIS
10. If an invalid identification/password is entered, an error message appears in the window.  
Source: MSG, DODIIS, DODSG, JMCIS
11. Users who fail repeatedly to log on are locked out of the system and informed that they must contact the system administrator.  
Source: MSG, DODIIS, DODSG, JMCIS
12. During start-up, the system should display a message window indicating its unavailability, change the pointer shape to an hourglass or watch, and disable input from the pointing device and keyboard.  
Source: MSG, DODIIS, DODSG, JMCIS

13. When the system is ready, the message disappears, the pointer is a standard shape, and the input is enabled.  
Source: MSG, DODIIS, DODSG, JMCIS
14. If appropriate, the system displays status messages, e.g., response time, and unavailability.  
Source: MSG, DODIIS, DODSG, JMCIS

System Title or Logo	
Login:	<input type="text"/>
Password:	<input type="text"/>

**Figure 7-1. Example Login Window**

## **7.2 THE SYSTEM WINDOW**

### **7.2.1 System Window Appearance and Behavior**

1. The system window is displayed when the system start-up is complete.  
Source: DODIIS, DODSG, JMCIS
2. The system window covers the entire screen.  
Source: JMCIS
3. The system window contains classification, menu bars, and a title at the top.  
Source: DODIIS, DODSG, JMCIS
4. The current classification level appears in the middle of the classification bar.  
Source: DODIIS, DODSG, JMCIS
5. A digital clock is displayed to the right of the classification bar, and an alert area is displayed to the left of the classification bar (see Figure 7-2).  
Source: DODIIS, JMCIS  
Developer Note: Figure 7-2 displays a push button in the alert area. Alert messages from individual applications should be passed up to the system-level window. The push button in the alert area may be used to display a pop-up window where alert messages and priorities are displayed. Developers shall also place some sort of indicator to notify the user that alerts are present and, if necessary, to denote the priority of the alert.

6. The system menu bar lists the titles of the menus available at the system level.  
Source: DODIIS, DODSG, JMCIS
7. These menus provide access to the application programs available within the system.  
Source: DODIIS, DODSG, JMCIS
8. Action icons common to all applications are placed along the left margin from the top down.  
Source: DODIIS, DODSG, JMCIS  
Developer Note: Users may be given the preference to display action icons common to all applications along the left margin or underneath the system-level menu bar from left to right.
9. Action icons mirror but do not replace selections in a menu.  
Source: AFSSC, JMCIS
10. Icons for application windows are displayed at the lower-left corner of the screen.  
Source: DODIIS, DODSG, JMCIS
11. The system window has the appearance and behavior per Figure 7-2.  
Source: JMCIS  
Developer Note: At present the colors chosen in the User Interface Specification for Navy Command and Control, version 1.2 have been adopted for TBM. Future versions of the TBM HCI Specification will examine additional color sets to accommodate different environments and display hardware.
12. The system window cannot be moved or resized.  
Source: JMCIS
13. The classification and system menu bars cannot be obscured by application windows.  
Source: DODIIS, DODSG, JMCIS
14. The system window is always available so users can select help and system-level menu options.  
Source: DODIIS, DODSG, JMCIS
15. The system window has a default initial appearance following start-up.  
Source: DODIIS, DODSG, JMCIS
16. The system window shall contain an alert button which is used to display a list of alerts generated from individual applications.  
Source: adapted from DODSG, JMCIS
17. The system window shall contain an area to display the current duty group position(s) that the user is logged in as.

### System Window Object Appearance and Behavior

- |  |   |                |              |         |        |            |            |            |  |
|--|---|----------------|--------------|---------|--------|------------|------------|------------|--|
| <p><b>① Classification Bar</b><br/>Background color depends on classification:</p> <table border="0"> <tr> <td>Unclassified</td> <td>MediumSeaGreen</td> </tr> <tr> <td>Confidential</td> <td>SkyBlue</td> </tr> <tr> <td>Secret</td> <td>Firebrick2</td> </tr> <tr> <td>Top Secret</td> <td>DarkOrange</td> </tr> </table> <p>No 3-D effect, black text</p> | Unclassified  | MediumSeaGreen | Confidential | SkyBlue | Secret | Firebrick2 | Top Secret | DarkOrange | <p><b>③ System Level Menu</b><br/>SkyBlue background, raised effect, Black text for available options, Gray text for unavailable options; first available option has SkyBlue background, raised effect, Black Text<br/>When an option is selected: SkyBlue background, raised effect, Black text</p> |
| Unclassified   | MediumSeaGreen  |                |              |         |        |            |            |            |  |
| Confidential   | SkyBlue   |                |              |         |        |            |            |            |  |
| Secret   | Firebrick2  |                |              |         |        |            |            |            |  |
| Top Secret   | DarkOrange  |                |              |         |        |            |            |            |  |
| <p><b>② System Menu Bar</b><br/>SkyBlue background, raised effect, Black text<br/>When a title is selected: SkyBlue background, raised effect, Black text</p>  | <p><b>④ Workspace</b><br/>LightGray background, no 3-D effect</p> |                |              |         |        |            |            |            |  |

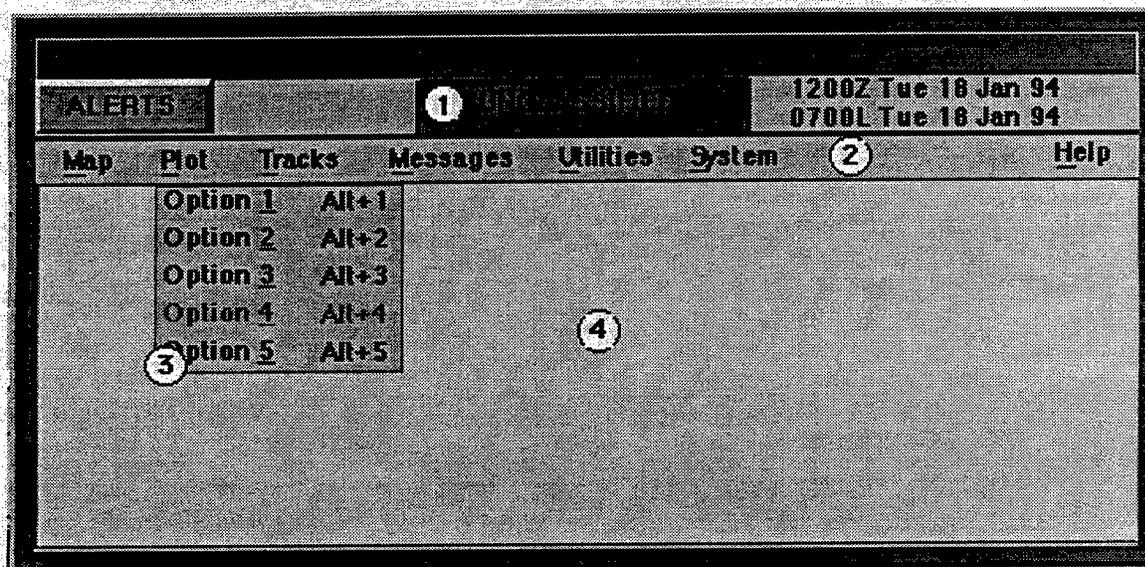


Figure 7-2. Appearance (Color and 3-D Effect) of the System Window

#### 7.2.2 System Window Classification Markings

1. The classification marking indicates the highest level of data currently displayed.  
Source: MSG, DODIIS, DODSG, JMCIS
2. The unclassified bar is green, the Confidential is blue, the Secret is red, and the Top Secret is orange.  
Source: JMCIS
3. The classification colors are displayed as background in the classification bar.  
Source: JMCIS

4. The classification text is in uppercase letters, at least 14-point bold font.  
Source: JMCIS

### **7.3 THE SYSTEM MENU**

#### **7.3.1 The System Menu Bar**

1. The menu titles in the system menu describe the overall functionality of the system.  
Source: DODIIS, DODSG, JMCIS
2. The menu bar contains no more than ten menu titles plus Help.  
Source: JMCIS
3. The menu bar must be placed beneath the alert classification and time area and on top of the Application Area. The menu bar runs from border to border across the window.  
Source: MSG, DODIIS, DODSG, JMCIS
4. Only menus shall be available on the Menu bar.  
Source: MSG, DODIIS, DODSG, JMCIS
5. Menu titles begin at the left margin and extend rightward; they are spaced for easy reading.  
Source: MSG, DODIIS, DODSG, JMCIS
6. Each menu title and menu option includes a mnemonic.  
Source: MSG, DODIIS, DODSG, JMCIS
7. Leftmost menu titles provide functions related to system, map, and communication displays.  
Source: JMCIS
8. Middle menu titles provide functions that are specific to the particular system.  
Source: JMCIS
9. Rightmost menu titles provide support and miscellaneous functions.  
Source: JMCIS
10. Help appears at the far right margin of the system menu bar.  
Source: JMCIS
11. This system uses the same menu titles as other systems providing the same functionality.  
Source: JMCIS
12. An application has the same name whenever it is part of a system, and it is in same system menu.  
Source: JMCIS

### **7.3.2 Access to System and Application Functions**

1. A system integrates common application functions so they are accessed in a single window.  
Source: JMCIS
2. System menu options available within an application are displayed in normal text.  
Source: JMCIS
3. Options that are inappropriate to execute from within the application are dimmed.  
Source: JMCIS
4. If all of the options in a system menu are inappropriate, the menu title is dimmed.  
Source: JMCIS
5. If only one instance of an application can run, the menu option is dimmed while running.  
Source: JMCIS
6. If multiple instances of an application can run, the menu option returns to normal to indicate it can be selected.  
Source: JMCIS
7. Users can select Help from the system menu bar at any time.  
Source: DODIIS, DODSG, JMCIS
8. Users can browse all titles in the system menu bar even if all menu options are unavailable.  
Source: JMCIS
9. Each system includes navigational aids as an alternative to the function-oriented menus.  
Source: JMCIS
10. Navigational aids are accessible through Help in the system window.  
Source: JMCIS
11. Navigational aids provide direct access to the part of the system selected in the aid.  
Source: JMCIS

### **7.4 SYSTEM SUPPORT**

1. A system includes resources and utilities needed to support overall tactical functionality. Resources include logout, print, status, preferences, alerts, peripherals, and files. Utilities include basic features, COTS software, macros, and briefing support.  
Source: JMCIS
2. Users can print an entire screen or a window with/without secondary windows.  
Source: JMCIS

3. Printing includes the classification marking and produces an accurate translation of color shading from the display to the paper copy.  
Source: JMCIS  
Developers Note: Black and white printers must (by use of dithering and grayscale rendition) produce paper copies where colors are translated as distinguishable from one another.
4. Users can work with files without detailed knowledge of the file structure.  
Source: JMCIS
5. A system includes a screensaver and provides a means to rapidly suppress a display.  
Source: JMCIS
6. Users can temporarily suspend a session without logging out.  
Source: JMCIS
7. During suspension, processing continues but interaction is not allowed (i.e., keystrokes shall not be accepted) until the session is resumed.  
Source: JMCIS
8. If navigation among multiple overlapping windows is required, each system shall provide users with the ability to identify (e.g., by selecting an Active Window menu option) all open windows, obtain information about them (e.g., the associated application, date created, size, etc.), and move input focus among them.  
Source: JMCIS
9. A system provides the user-specified settings needed to support overall system functions. These functions might include: functions assigned to pointing device buttons, screen location for displaying action icon buttons, location for displaying active application icons, whether or not to use the icon box, criteria for alert generation, printer destination, and/or elapsed time before automatic logout.  
Source: JMCIS
10. A default value for each user-specified setting is set for all applications unless changed by users.  
Source: JMCIS
11. Users can review the user-specified settings and reset them at any time during a session.  
Source: JMCIS
12. When users end the session, session-specific settings revert to the default values.  
Source: JMCIS

## **7.5 SYSTEM LOGOUT**

1. Users select Logout from the System menu to end a session.  
Source: DODIIS, DODSG, JMCIS

2. Users are prompted to confirm Logout if there is any unsaved data.  
Source: DODIIS, DODSG, JMCIS
3. Users are prompted to logout of any applications that required they login to.  
Source: DODIIS, DODSG, JMCIS
4. During logout, all processing in application windows stops, and all windows are closed.  
Source: DODIIS, DODSG, JMCIS
5. When logout is complete, the initial login window is displayed.  
Source: DODIIS, DODSG, JMCIS
6. If there is auto logout, the system has the standard length of user inactivity before logout occurs.  
Source: DODIIS, DODSG, JMCIS
7. Users can modify the time period before auto logout occurs.  
Source: DODIIS, DODSG, JMCIS
8. A message is displayed during inactivity indicating the action needed to avoid auto logout.  
Source: DODIIS, DODSG, JMCIS
9. An auditory signal is presented at intervals during the period of inactivity.  
Source: DODIIS, DODSG, JMCIS
10. For auto logout, unsaved data is saved, with a message indicating logout and file name.  
Source: DODIIS, DODSG, JMCIS

## SECTION 8

### APPLICATION-LEVEL WINDOWS

#### 8.1 ORGANIZATION

1. All primary and dialog windows contain a title and a main area. Application windows should also contain a menu bar, a command area, and/or a message area.  
Source: AFSSC, JMCIS
2. Applications are differentiated by consistent color coding between the application menu bar and the background of the dialog windows that are spawned by the application. As an alternative, where the primary application does not have a menu bar, applications could be color coded by using distinctive colored mattes.

##### 8.1.1 Window Title

1. A window title appears in the title bar of a window.  
Source: MSG, DODIIS, DODSG, AFSSC JMCIS
2. The title is centered in the title bar and presented in mixed-case letters. The first letter of each significant word in a title and abbreviations shall be capitalized (e.g., Office Sym).  
Source: AFSSC
3. Each window title in an application is unique.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
4. If an application has multiple primary windows, each title indicates the window purpose and includes the application name separated by a dash (-).  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
5. The title of a dialog window matches the wording of the menu option that displayed it.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS

##### 8.1.2 Window Menu Bar

1. If a window includes a menu bar, it appears below the title bar.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. The menu bar contains no more than ten menu titles plus Help.  
Source: AFSSC, JMCIS
3. The titles begin at the left margin and extend rightward, with Help at the right margin.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
4. Each menu title includes a mnemonic.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS

- Options in application menus are unique and do not duplicate functions in the system menu; application menu titles are unique and do not duplicate the titles of the system menu.  
Source: AFSSC, JMCIS
- A menu has the same title and contains the same options whenever it is in an application menu bar.  
Source: JMCIS

### **8.1.3 Arrangement of Window Controls**

- Controls performing similar/related functions are physically grouped together.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
- Grouped controls have a frame and are clearly labeled to indicate the functions they perform.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
- Controls for similar options are grouped together while controls for different options are grouped separately.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
- If scroll bars are needed, they are located to the right or at the bottom of the area being scrolled.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
- Controls that are temporarily unavailable are dimmed and not available for selection.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
- Controls that are never available to users do not appear in a window.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS

### **8.1.4 Arrangement of Push Buttons**

- The push buttons are displayed at the bottom of the window in a row that is centered.  
Source: AFSSC, JMCIS  
Developer Note: Push buttons should appear in the action area of a dialog. For custom dialogs it is easier to contain the action area in a separate widget. A Form widget can be used in order to position buttons evenly across the width of a dialog. The XmNfractionBase resource of the form widget is set to 2 times the number of push buttons + 1. For example, if a dialog had 3 buttons the XmNfractionBase resource should be set to 7. This will break the Form down into equal units. Position zero is the left edge of the form and the XmNfractionBase number that was set is at the right edge of the form. Position the left and right sides of the first button at position one and two, respectively. Position the left and right sides of the next button at position 3 and 4, respectively. This will leave a space between position 2 and 3 and as a result will leave a space between the first and second button. Continue until all the buttons are placed on the Form widget. By using this layout method, developers do not have to be concerned with the width of the form of the DialogShell itself, since the placement of the buttons will always be proportional.

2. Push button order shall use the following common labels and actions and shall appear from left to right in the following sequence: Yes, No, OK, Close, Apply, Retry, Stop, Pause, Resume, Reset, Cancel, and Help.  
Source: MSG, AFSSC, JMCIS
3. Push button order in modal windows: OK/Cancel/Help.  
Source: MSG, JMCIS
4. Push button order in modeless windows: OK/Apply/Cancel/Help or OK/Apply/ Reset/ Cancel/Help.  
Source: MSG, JMCIS
5. Apply is the default in modeless windows that are displayed for multiple actions.  
Source: MSG, JMCIS
6. A Help button is included in every window and is the rightmost button.  
Source: MSG, JMCIS  
Developer Note: A help button shall not be required if window-specific help information is available via a help menu.
7. Application-specific push buttons are ordered left to right based on the sequence of use, with the most often used push button on the left.  
Source: MSG, JMCIS
8. Buttons for positive actions are on the left, and followed by negative and canceling actions.  
Source: MSG, JMCIS
9. Push buttons appear in the same order throughout the application.  
Source: MSG, JMCIS
10. If push button actions affect different objects, their labels reflect what each affects.  
Source: MSG, JMCIS
11. Push buttons are arranged near the object(s) to which they are related.  
Source: MSG, JMCIS
12. Push buttons related to overall window functionality (e.g., OK, Cancel) are at the bottom of the window.  
Source: JMCIS

### **8.1.5 Action Icon Behavior in an Application**

1. An action icon palette appears along the left margin of the window or below the menu bar.  
Source: MSG, JMCIS
2. An action icon palette can be repositioned and removed from the window if desired.  
Source: JMCIS

3. An action icon palette contains no more than 20 action icons. If numerous and/or non-standard action icons are used, developers shall consider placing the command or an abbreviated form of the command directly beneath the icon.  
Source: JMCIS
4. The icons chosen as command action icons are consistent throughout an application and, if possible, across applications.  
Source: JMCIS
5. Action icons mirror, but do not replace, selections in a menu.  
Source: AFSSC
6. Action icons in a palette are spaced so that a location can be displayed.  
Source: JMCIS
7. An action icon palette supports navigation and selection from the keyboard.  
Source: MSG, JMCIS  
Developer Note: This shall be accomplished by the same means as any push button is activated from the keyboard.

### **8.1.6 Message Bar**

1. A message bar at the bottom of a window margin is used for non-critical application messages.  
Source: MSG, AFSSC, JMCIS
2. The left side of the message bar is for routine messages, simple help, and window status.  
Source: MSG, AFSSC, JMCIS
3. The right side of the message bar is used for information about the window.  
Source: MSG, AFSSC, JMCIS
4. A message bar is part of the primary window and may also be part of a dialog window.  
Source: MSG, AFSSC, JMCIS

## **8.2 COLOR USE IN WINDOWS**

### **8.2.1 Color of Objects**

1. Interface objects have the appearance indicated in Table 8-1.  
Source: JMCIS  
Developer Note: At present the colors chosen in the User Interface Specification for Navy Command and Control, version 1.2 have been adopted for TBM. Future versions of the TBM HCI Specification will examine additional color sets to accommodate different environments and display hardware.
2. Users can select alternative color sets. However modifications in basic color appearance follow the guidelines in Section 8.2.2.  
Source: JMCIS

3. Changing to an alternative color set does not alter security classification colors.  
Source: AFSSC, JMCIS

**Table 8-1. Appearance (Color and 3-D Effect) of Objects in Application Windows**

<b>Object</b>	<b>Appearance and Behavior</b>
<u>Window Components</u>	
Title Bar	In an active window: DarkSlateBlue background, raised effect, Black text In an inactive window: LightBlue background, raised effect, LightGray text When selected: DarkSlateBlue background, depressed effect
Resize Border	In an active window: DarkSlateBlue background, raised effect In an inactive window: LightBlue background, raised effect When selected: No change in color or 3-D effect
Window Menu Button	In an active window: DarkSlateBlue Background, raised effect In an inactive window: LightBlue background, raised effect When selected: DarkSlateBlue background, depressed effect.
Maximize Button	In an active window: DarkSlateBlue Background, raised effect In an inactive window: LightBlue background, raised effect When selected: DarkSlateBlue background, depressed effect.
Minimize Button	In an active window: DarkSlateBlue Background, raised effect In an inactive window: LightBlue background, raised effect When selected: DarkSlateBlue background, depressed effect.
Window Menu	Basic appearance when displayed: LightBlue background, raised effect, Black text for available options, Gray text for unavailable options; first available option appears as a raised push button with LightBlue background, raised effect, Black text When an option is selected: The option becomes a push button with LightBlue background, raised effect, Black text.
Client Area	Basic appearance: LightBlue background
Icon	Basic appearance: Icon image with LightBlue background, raised effect, Black text in the icon label
<u>Controls</u>	
Push Button	Basic appearance: LightBlue background, raised effect, Black text When selected: Gray background, depressed effect, Black text
Radio Button	Basic appearance: LightBlue background, raised effect, Black text

**Table 8-1. Continued**

Controls

(continued)

Check Button	When selected: SlateGray background, depressed effect, Black text
Text Field (Editable)	Basic appearance: Azure2 Background, depressed effect, Black text When text in the object is selected: Black background, Azure2 text
Text Field (Noneditable)	Basic appearance: LightBlue3 background, flat effect, Black text When text in the object is selected: No change in the text color
List Box	Basic appearance: LightBlue3 background, depressed effect, Black text When an item is selected: Black background, LightGray text
Scroll Bar	Basic appearance: LightBlue background, raised effect for stepper arrow and slider; SlateGray background for trough When a stepper arrow is selected: SlateGray background, depressed effect When the slider is selected: No change in color or 3D effect
Scale	Basic appearance: LightBlue background, raised effect for slider; SlateGray background, raised effect for scroll region; Black text When the slider is selected: No change in color or 3-D effect
<u>Menus</u>	
Pull Down Menu Bar	Basic appearance: LightBlue background, raised effect, Black text When selected: Title appears as a push button with LightBlue background, raised effect, Black text Developer Note: An application menu bar may be used to color code different applications. Developers should choose colors in the mid-range of RGB brightness (155 to 175 on a 256 scale where 0 is black and 256 is white). When a menu bar color is chosen, dialog boxes should have the same background color as the menu bar from which they were generated.
Pull Down Menu	Basic appearance when displayed: LightBlue background, raised effect, Black text for available options, Gray text for unavailable options, first available option appears as a push button with LightBlue Background, raised effect, Black text When an option is selected: Option becomes a push button with LightBlue background, raised effect, Black text
Pop-Up Menu	Basic appearance when displayed (with Menu button): LightBlue background, raised effect, Black text for available options, Gray text for unavailable options; first available option has LightBlue background, raised effect, Black text When an option is selected: LightBlue background, raised effect, Black text

**Table 8-1. Concluded**

Menus

(continued)

Option Menu	Basic appearance (of displayed option): Push button with LightBlue background, raised effect, Black text, bar graphic with LightBlue background, raised effect Basic appearance (when menu is displayed): LightBlue background, raised effect, Black text; option that was displayed has LightBlue background, raised effect, Black text When an option is selected: LightBlue background, raised effect, Black text
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**8.2.2 Guidelines on Color Selection**

1. Color is used for coding to highlight, aid in grouping, or to clarify relationships.  
Source: AFSSC, JMCIS
2. Color is used consistently within an application and between applications in a system.  
Source: DODIIS, DODSG, AFSSC, JMCIS
3. Color pairs at spectral extremes (e.g., red/green, yellow/purple) are not used together.  
Source: DODIIS, DODSG, AFSSC, JMCIS
4. White text is not displayed on a black background.  
Source: DODIIS, DODSG, AFSSC, JMCIS
5. Blue is not used as a text color, for small objects or for any critical information.  
Source: DODIIS, DODSG, AFSSC, JMCIS
6. Red is used to indicate critical or irreversible options; noncritical options are not red.  
Source: DODIIS, DODSG, AFSSC, JMCIS
7. Colors for the status are the same throughout the application and restricted to that function.  
Source: DODIIS, DODSG, AFSSC, JMCIS
8. Color in message windows appears in the symbol and is not used for text.  
Source: DODIIS, DODSG, AFSSC, JMCIS
9. Red is used only to alert that application/process is inoperative until corrective action is taken.  
Source: DODIIS, DODSG, AFSSC, JMCIS
10. Yellow is used only to alert to situations involving caution, recheck, or unexpected delay.  
Source: DODIIS, DODSG, AFSSC, JMCIS

11. If color is used to impart meaning, it is used redundantly and shall not be the only coding technique.  
Source: DODIIS, DODSG, AFSSC, JMCIS
12. If color coding is used, each color represents one category of displayed data.  
Source: DODIIS, DODSG, AFSSC, JMCIS
13. The number of colors for alphanumeric display do not exceed seven, only four codes at one time.  
Source: AFSSC
14. The number of colors for graphical displays do not exceed nine.  
Source: AFSSC
15. Slight shade changes in color are not used to show gradation or choice.  
Source: DODIIS, DODSG, AFSSC, JMCIS
16. The background color behind the text is not used to show a change in the system status.  
Source: DODIIS, DODSG, AFSSC, JMCIS
17. Change in the system status is signaled by changing the color of an object next to the text.  
Source: DODIIS, DODSG, AFSSC, JMCIS
18. Black is not used as the background for color-coded items.  
Source: DODIIS, DODSG, AFSSC, JMCIS
19. Background color is an unsaturated hue (e.g., tan, off-white) but not pure white.  
Source: DODIIS, DODSG, AFSSC, JMCIS

### **8.3 TEXT FIELDS**

For information, see also Section 9.2 on data entry windows.

#### **8.3.1 Format of Text Fields**

1. The label appears to the left or above the text field and describes what is to be entered or what is to be displayed.  
Source: DODIIS, AFSSC, JMCIS
2. The label of a text field includes cues regarding format.  
Source: MSG, AFSSC, JMCIS
3. If a unit of measurement is always used, it is part of the label and does not have to be entered.  
Source: DODSG, AFSSC, JMCIS
4. The label is designed so that users can easily distinguish it from the text field.  
Source: DODSG, AFSSC, JMCIS

5. The text field indicates the basic features of the entry required.  
Source: AFSSC, JMCIS
6. If information being entered is a fixed length, the text field is the same length.  
Source: DODSG, JMCIS
7. If the length of information varies, the text field is as long as the longest information.  
Source: DODSG, JMCIS
8. The text field will include scroll bars if space in the window is limited.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
9. The text field includes a decimal point if numeric data are entered in decimal format.  
Source: DODSG, JMCIS  
Developer Note: The only practical way of accomplishing this is to separate the data into different text fields for each side of the decimal point. Developers should only do this when it will significantly reduce use data entry time.
10. Field format is consistent with users' expectations and presented in meaningful chunks.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
11. Strings over 5-7 characters long are entered in smaller chunks, separated by a delimiter.  
Source: DODSG, JMCIS
12. Data that are known or can be computed are automatically entered in a field.  
Source: JMCIS
13. Noneditable text is presented directly in a window and not within a frame.  
Source: JMCIS
14. When the pointer is on noneditable text, its shape does not change to an I-beam.  
Source: MSG, AFSSC, JMCIS
15. Clicking on noneditable text does not change its appearance or display a text cursor.  
Source: MSG, AFSSC, JMCIS

### **8.3.2 Text in Windows**

#### **8.3.2.1 Text, Font, Size, and Readability**

1. Normal, dimmed, and highlighted text appear and behave as indicated in Table 8-1.  
Source: JMCIS
2. Black is used for text in windows.  
Source: AFSSC
3. If text is other than black, color has sufficient contrast with background to be readable.  
Source: DODIIS, DODSG, AFSSC, JMCIS

4. Sans serif fonts are used to present system fonts. Serif fonts may be used for user generated fonts.
5. Text is of sufficient size and thickness to be readable at normal viewing distance.  
Source: JMCIS
6. Text characters contain a minimum 7 X 9 dot matrix construction.  
Source: JMCIS
7. Text for a briefing presentation is readable at the normal audience viewing distance.  
Source: JMCIS
8. Text used for briefing presentations is a minimum of 10 X 14 dot matrix format, double stroke width.  
Source: JMCIS
9. Applications that do word processing provide a choice of fonts as a user-selectable option.  
Source: JMCIS
10. Text labels shall not be run together, nor shall they be separated by an underscore, or any delimiters other than a single space.  
Source: JMCIS
11. Different fonts may be used to distinguish static (titles, labels) from system/application generated data.  
Source: JMCIS
12. For widget labeling, variable pitch fonts are recommended because of their legibility and space efficiency.  
Source: Kobara
13. The character stroke width of a system font shall be at least 2 pixels in thickness.  
Source: Kobara
14. The selected font style shall be legible in various display resolutions from 72 pixels per inch to 120 pixels per inch.  
Source: Kobara
15. User font cells shall be the same height as the system fonts that will be used with them. The glyphs within the character cell for a user font shall be positioned at the same location and have the same height as those for the associated system fonts.  
Source: Kobara

#### **8.3.2.2 Capitalization**

1. Titles and major headings are presented in uppercase letters.  
Source: AFSSC, JMCIS
2. All other text uses a combination of upper- and lowercase and follows standard rules.  
Source: AFSSC, JMCIS

3. A consistent approach to capitalization is used in the application.  
Source: AFSSC, JMCIS
4. All uppercase letters are used only for acronyms.  
Source: AFSSC, JMCIS
5. Arabic rather than Roman numerals are used when information has to be numbered.  
Source: AFSSC, JMCIS

### **8.3.2.3 Acronyms and Abbreviations (See Appendix B for TBM-Specific Abbreviations)**

1. Acronyms/abbreviations are used only if shorter than full name and understood by users.  
Source: JMCIS
2. Abbreviations are the shortest possible length that will ensure uniqueness.  
Source: JMCIS
3. Abbreviations are meaningful, recognizable, and used consistently.  
Source: JMCIS
4. Words not commonly abbreviated are not abbreviated.  
Source: JMCIS
5. Acronyms/abbreviations comply with MIL-STD-12, MIL-STD-411, and MIL-STD-783.  
Source: JMCIS
6. New acronyms are generated following rules contained in MIL-STD-12.  
Source: JMCIS
7. A dictionary is available (e.g., in Help) for decoding abbreviations/acronyms.  
Source: AFSSC, JMCIS

### **8.3.2.4 Noneditable and Editable Text**

1. Consistent grammatical structure is used for all noneditable text in windows.  
Source: MS1472, MS1801, ESD-TR, JMCIS
2. Wording is consistent and uses familiar terms and task-oriented language of users.  
Source: MS1472, MS1801, ESD-TR, JMCIS
3. Blocks of text are broken into smaller, meaningful groups.  
Source: MS1472, MS1801, ESD-TR, JMCIS
4. Continuous text is phrased in simple sentences, in the affirmative, and in active voice.  
Source: MS1472, MS1801, ESD-TR, JMCIS
5. A sequence of events or steps is presented in the order the steps are performed.  
Source: MS1472, MS1801, ESD-TR, JMCIS

6. The referent for "it" or "they" in a sentence is easily identified.  
Source: JMCIS
7. Normal punctuation rules are followed, and contractions and hyphenation are avoided.  
Source: MS1472, MS1801, ESD-TR, JMCIS
8. Editable text is displayed in upper/lowercase as appropriate to the task being performed.  
Source: JMCIS
9. Stored text is shown in standard format; text editing is converted into this format.  
Source: JMCIS

### **8.3.2.5 Formats For Date/Time and Latitude/Longitude**

The following Date/Time and Latitude/Longitude formats were drawn from the DOD Style Guide and the User Interface Specifications for JMCIS. Developers should also consider providing users with the capability to enter and display alternative formats as required.

1. The format for presenting date information is YYMMDD where YY is the last two digits of the year, MM is the month with a leading zero if necessary, and DD is the day with a leading zero if necessary (e.g., The date for February 3, 1994 would appear as 940203).  
Source: DODSG, JMCIS
2. The format for presenting time information is HHMM[SS]Z where HH is the hour in a 24 hour day, MM is the minute with a leading zero if necessary, and SS is the second with a leading zero if necessary, and Z is the time zone with Zulu time as the default. The inclusion of seconds is optional. (The time for 1:23 P.M., Zulu would appear as 1323Z.  
Source: DODSG, JMCIS
3. The format for date/time group is DDHHMM[SS]Z MMM YY where DD is the day with the leading zero if necessary, HH is the hour with a leading zero if necessary, MM is the minute with a leading zero if necessary, SS is the second with a leading zero if necessary, and Z is the time zone with Zulu as the default with MMM as the abbreviated month and YY is the last two digits of the year. (The date/time group for February 3, 1994 at 1:23 p.m., Zulu would appear as 031323ZFEB94.  
Source: DODSG, JMCIS
4. Latitude/longitude information is displayed in separate field.  
Source: DODSG, JMCIS
5. The format for latitude information is D{D}H with Latitude/Longitude labels where D is one or two characters is the degrees of latitude, and H is the hemisphere with N for North and S for South or DD{MM{SS}}H where DD is the degrees of latitude, MM is the minutes of latitude and is optional, SS is the seconds of latitude and is optional and only presented if minutes are presented, and H is the hemisphere (N for North and S for South).  
Source: DODSG, JMCIS

6. The format for longitude information is D{D{D}}H where D (one, two, or three characters) is the degrees of longitude and H is the hemisphere (E for East and W for West) or DDD{MM{SS}}H where DDD is the degrees of longitude, MM is the minutes of longitude and is optional, SS is the seconds of longitude and is optional and only presented if minutes are presented, and H is the hemisphere (E for East and W for West).  
Source: DODSG, JMCIS

### **8.3.2.6 Wild Card Characters in Text Searches**

1. Users can enter wild card characters to search for specific text patterns.  
Source: JMCIS
2. The @ searches for the occurrence of a single upper- or lowercase alphabetic character.  
Source: JMCIS
3. The # searches for the occurrence of a single numeric character.  
Source: JMCIS
4. The ? searches for the occurrence of a single alphanumeric character.  
Source: JMCIS
5. The \* searches for the occurrence of zero or more alphanumeric characters.  
Source: JMCIS

## **8.4 CONSIDERATIONS IN WINDOW DESIGN**

### **8.4.1 Selecting Objects to Match User Actions**

1. Primary window(s) are used for primary actions and to present frequently used controls.  
Source: MSG, JMCIS  
Developer Note: See also Section 6.1.1, Primary Windows.
2. Dialog windows are used for ancillary actions and to present less-used controls.  
Source: MSG, JMCIS  
Developer Note: See also Section 6.1.3, Dialog Windows.
3. Radio buttons are used when selecting an option from up to six mutually exclusive options.  
Source: MSG, JMCIS  
Developer Note: See also Section 5.2, Radio Buttons.
4. An option menu is used when more than six options (no more than 10-12) are available.  
Source: MSG, JMCIS  
Developer Note: See also Section 4.4, Option Menus.
5. An option menu is used instead of the radio buttons when space is limited.  
Source: MSG, JMCIS  
Developer Note: See also Section 4.4, Option Menus.

6. A list box is used when selecting from a large group of options (more than 12).  
Source: MSG, JMCIS  
Developer Note: See also Section 5.4, List Boxes.
7. Radio buttons or an option menu is used when the set of options is not likely to change.  
Source: MSG, JMCIS
8. A list box is used when the options might change.  
Source: MSG, JMCIS
9. Check buttons are used when choosing from up to seven items in a group; otherwise a list box is used.  
Source: MSG, JMCIS  
Developer Note: See also Section 5.3, Check Boxes.
10. Push buttons shall be used for frequently used selections, and when the pointing device is already moving.  
Source: MSG, JMCIS
11. Use pop-up menus only when it is critical to the application that users be able to access functions without moving the pointing device.  
Source: JMCIS  
Developer Note: See also Section 4.3, Pop-up Menus.
12. Pop-up menus shall not be used as the only method available for accessing operations.  
Source: JMCIS
13. Option menus are used when setting values or choosing from a set of related items.  
Source: MSG, JMCIS

#### **8.4.2 Arranging Information to Match User Actions**

1. A window is designed so users can manipulate objects in ways that support task performance.  
Source: MS1472, MS1801, ESD-TR, MSG, DODIIS, DODSG, AFSSC, JMCIS
2. Objects are arranged so users can move quickly and easily among them.  
Source: MS1472, MS1801, ESD-TR, MSG, DODIIS, DODSG, AFSSC, JMCIS
3. Pointer movement/keystrokes needed to perform task are minimized.  
Source: MS1472, MS1801, ESD-TR, MSG, DODIIS, DODSG, AFSSC, JMCIS
4. Window layout supports natural scanning order (from left to right and top to bottom).  
Source: MS1472, MS1801, ESD-TR, MSG, DODIIS, DODSG, AFSSC, JMCIS
5. Window layout is logical to users and appropriate to actions executed.  
Source: MS1472, MS1801, ESD-TR, MSG, DODIIS, DODSG, AFSSC, JMCIS

### **8.4.3 Arranging Information by Importance**

1. The most important information and controls are in the upper left part of the window.  
Source: MS1472, MS1801, ESD-TR, MSG, DODIIS, DODSG, AFSSC, JMCIS
2. The objects in a window are arranged to accommodate users resizing the window.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
3. Task-critical information is visually set apart from other information.  
Source: MS1472, MS1801, ESD-TR, MSG, DODIIS, DODSG, AFSSC, JMCIS
4. At least one space above/below and two spaces before/after separates critical information.  
Source: MS1472, MS1801, ESD-TR, MSG, DODIIS, DODSG, AFSSC, JMCIS

### **8.4.4 Designing Windows to Minimize Memory Load**

1. A window contains all of the information relevant to the task.  
Source: MS1472, MS1801, ESD-TR, MSG, DODIIS, DODSG, AFSSC, JMCIS
2. Users perform the task called for in a window without referring to external information.  
Source: MS1472, MS1801, ESD-TR, MSG, DODIIS, DODSG, AFSSC, JMCIS

### **8.4.5 Coding Critical Information in Windows**

1. Capitalization is not the sole indication of critical information in a window.  
Source: JMCIS
2. Bolding/brightening, color coding, etc., are used to focus attention on critical information.  
Source: MS1472, MS1801, ESD-TR, MSG, DODIIS, DODSG, AFSSC, JMCIS
3. Both color and sound shall be used for critical messages, and users shall be required to respond before an audio alarm is terminated.  
Source: MS1472, MS1801, ESD-TR, DODIIS, DODSG, AFSSC, JMCIS
4. Auditory signals are used to alert critical conditions or operations.  
Source: MS1472, MS1801, ESD-TR, JMCIS
5. For noncritical auditory alarms, a simple action acknowledges/turns off the signal.  
Source: MS1472, MS1801, ESD-TR, JMCIS
6. Auditory signals are intermittent in nature and allow sufficient time to respond.  
Source: MS1472, MS1801, ESD-TR, JMCIS
7. Auditory signals are distinctive in intensity and pitch and do not exceed four auditory signals.  
Source: JMCIS
8. Flash coding is used only to display urgent information for user attention.  
Source: MS1472, MS1801, ESD-TR, AFSSC, JMCIS

9. No more than two levels of blinking or flashing codes are used.  
Source: JMCIS
10. The flash rate is 3-5 Hz with equal on/off times. For two levels of flash rate, the second is less than 2 Hz with equal on/off times.  
Source: JMCIS
11. For flash coding of displayed item, a flashing symbol is used. A text item is not blinked.  
Source: JMCIS
12. Users can acknowledge the event causing the flashing and suppress it if desired.  
Source: JMCIS

#### **8.4.6 Dynamic Information in Windows**

1. For dynamically changing information, users are able to control the rate of update.  
Source: JMCIS
2. Users can freeze an updated display, then resume at the stoppage or the current time.  
Source: JMCIS
3. When displaying dynamically changing information, update values are no more than one/second.  
Source: JMCIS
4. When identifying rate of change or reading gross values, update values are 2-5 times/second.  
Source: JMCIS
5. Users are alerted to critical information in an inactive or iconified window.  
Source: JMCIS
6. Users are prompted to return to auto updating after freezing a dynamic window.  
Source: JMCIS
7. Users are informed if significant changes in data occurred while the display was frozen.  
Source: JMCIS

#### **8.4.7 Consistency in Design Across Windows**

1. A consistent organizational scheme for key elements is used in all application windows.  
Source: JMCIS
2. The same window design is employed whenever users perform the same basic task.  
Source: JMCIS
3. Different or distinctive elements can appear in a window to fit the task being performed, but these elements shall be consistent across windows within an application.  
Source: JMCIS

## **8.5 WINDOW MANAGEMENT**

### **8.5.1 Initial Window Appearance**

1. When a scrollable window first appears on the screen, the window shall display the topmost part of the information and shall show a complete line of text.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. Button settings are saved or reverted to the default state as appropriate to window function.  
Source: MSG, JMCIS
3. When the button(s) are selected but not executed, the application shall not save the selection and the button(s) shall return to their original state when the window is displayed.  
Source: MSG, JMCIS

### **8.5.2 Initial Window Size and Placement**

1. Users are able to resize an application window that covers all of the screen.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. Each window is sized so that all objects in it are visible when the window first appears.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
3. A window is wide enough to read the title and tall enough to read the title and menu bar.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
4. A window is displayed at the same location where it was when last closed or iconified.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
5. The window is placed so important information is at the center of the users' visual focus.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
6. The window is placed so important information is not obscured.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
7. The window is placed so the amount of pointer movement to execute an operation is minimized.  
Source: JMCIS
8. The dialog window is placed to the right of the information to which it relates.  
Source: MSG, JMCIS  
Developer Note: Kobara suggests that a gradual stepping alignment be used to display multiple non-modal dialog boxes that are spawned from an application. This will prevent new dialog boxes from appearing on top of each other. Each dialog box can be located in a position that is slightly downward and to the right.

### **8.5.3 Resizing**

1. When a window is resized, only the window borders (not the size of objects) are changed/resized.  
Source: MSG, DODIIS, DODSG, JMCIS
2. When a window is resized, the relative position of objects in the window does not change.  
Source: MSG, DODIIS, DODSG, JMCIS
3. The contents of the window remains visible during resizing so users can view the effect.  
Source: MSG, DODIIS, DODSG, JMCIS
4. Horizontal and vertical scroll bars appear as appropriate when a window is resized.  
Source: MSG, DODIIS, DODSG, JMCIS
5. Resizing is limited so that objects are not obscured when the window is at the minimum size.  
Source: MSG, DODIIS, DODSG, JMCIS
6. The pane size/contents may change automatically during resizing based on functionality.  
Source: MSG, DODIIS, DODSG, JMCIS

### **8.5.4 Processing in Iconified Windows**

1. Users are kept informed when processing is ongoing in an iconified window.  
Source: MSG, DODIIS, DODSG, JMCIS
2. Users are informed whenever critical processing events occur in an iconified window.  
Source: MSG, DODIIS, DODSG, JMCIS

## SECTION 9

### TASK-SPECIFIC WINDOWS

#### 9.1 HELP WINDOWS

##### 9.1.1 System-Level and Application-Level Help

1. Help is available to users at the system level and within individual applications.  
Source: JMCIS
2. System help describes capabilities and may have tutorial and navigational aids.  
Source: AFSSC, JMCIS
3. Application help includes general information on functionality and may include an index.  
Source: MS1472, MS1801, ESD-TR, MSG, DODSG, AFSSC, JMCIS
4. The help push button in a dialog window provides information on actions in the window.  
Source: MSG, DODSG, AFSSC, JMCIS
5. The help message in the message bar of a window explains how to complete an action.  
Source: AFSSC, JMCIS
6. Help as a keyboard function provides information about the object with keyboard focus.  
Source: JMCIS

##### 9.1.2 Help Window Design

1. A help window includes a title, a main scrollable area, and an OK push button at the bottom.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
2. The push button in a help window appears and behaves as the default action.  
Source: MSG, DODIIS, DODSG, AFSSC, JMCIS
3. When a help window appears, it is wide enough to read the text.  
Source: AFSSC, JMCIS
4. When a help window appears, it displays information at the beginning of the help description.  
Source: JMCIS
5. When a help window appears, it does not obscure what it is describing.  
Source: JMCIS
6. Users can move and resize a help window.  
Source: JMCIS

7. Users can keep the help window on the screen while working in another window.  
Source: JMCIS
8. Users can print any help window by selecting all or marking the beginning/end of a block of text.  
Source: JMCIS
9. When users are done with help, users can easily return to where they were working.  
Source: JMCIS

### **9.1.3 Help Window Content**

1. Help information explains the steps required to execute the action(s) in the window.  
Source: DODSG, AFSSC, JMCIS
2. Help information is limited to the actions that can be performed in the window.  
Source: AFSSC, JMCIS
3. Help information is worded concisely, using consistent structure, phrasing, and punctuation.  
Source: MS1472, MS1801, ESD-TR, DODIIS, DODSG, AFSSC, JMCIS
4. When presenting a sequence of steps, the explanation follows the same sequence.  
Source: AFSSC, JMCIS
5. Help information assumes users have had previous training and only need reminding.  
Source: MS1472, MS1801, ESD-TR, AFSSC, JMCIS
6. Users can easily scan help text; steps are numbered and in separate paragraphs.  
Source: AFSSC, JMCIS
7. Help decodes abbreviations/acronyms and explains the behavior of user-selectable objects.  
Source: AFSSC, JMCIS
8. A help window is removed when the related window is iconified or closed.  
Source: AFSSC, JMCIS

### **9.1.4 Online Training**

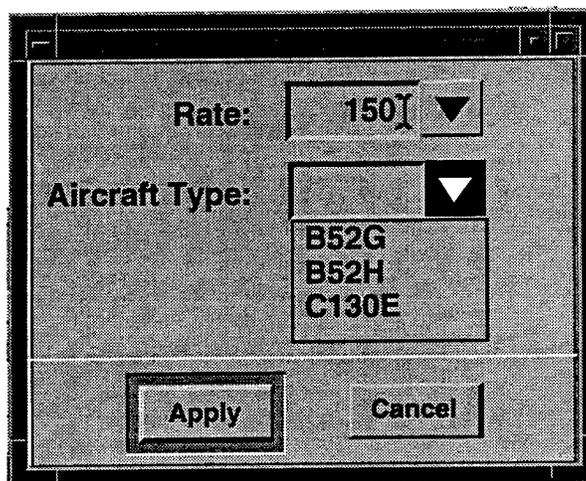
1. If implemented, online training is available at the system and application levels as a separate module.  
Source: DODSG, AFSSC, JMCIS
2. Online training is designed to accommodate different levels of users.  
Source: DODSG, JMCIS
3. Online training uses simulated data and protects real system data from change/corruption.  
Source: DODSG, JMCIS
4. The training mode is clearly indicated to users and kept separate from normal system use.  
Source: DODSG, JMCIS

## **9.2 DATA ENTRY WINDOWS**

### **9.2.1 Data Entry Window Design**

1. A data entry window includes a title that describes the contents of the window.  
Source: MS1472, ESD-TR, AFSSC, JMCIS
2. If there are multiple pages, each page has the same title, current page, and total pages indicator.  
Source: MS1472, ESD-TR, JMCIS  
Developer Note: With the advent of the scroll bar the page distinction has become blurred. However, data entry tasks are sometimes accomplished using "hard copy" pages. In this case, the multiple page distinction can be maintained. A combination scroll bar and scale widget can be combined so the scroll bar can be used to scroll through an individual page and the scale can be used to change pages. Using buttons to page forward, backward, the beginning and to the end can also be used but this is less efficient from a HCI point of view. See also Section 9.3 and 9.4.
3. If possible, related data fields appear on the same page.  
Source: MS1472, ESD-TR, JMCIS
4. The numbering of items is continuous from one page to the next.  
Source: MS1472, ESD-TR, JMCIS
5. The design of each window is consistent with the task being performed by users.  
Source: MS1472, ESD-TR, JMCIS
6. Data fields are organized by sequence of use, frequency of use, or importance.  
Source: MS1472, ESD-TR, JMCIS
7. Data fields are organized with related fields together and unrelated fields separated.  
Source: MS1472, ESD-TR, JMCIS
8. When users work from a hardcopy form, the window format has an identical format.  
Source: MS1472, ESD-TR, JMCIS
9. For tabular data, entry areas are arranged in rows and columns, with each row and each column labeled.  
Source: MS1472, ESD-TR, DODSG, JMCIS
10. If there are multiple pages, the row and column labels remain visible along the page edges.  
Source: MS1472, ESD-TR, JMCIS
11. Every fifth row of data is separated by a blank line or other delimiter.  
Source: MS1472, ESD-TR, JMCIS
12. Information is automatically justified; numeric data are aligned at the decimal point.  
Source: MS1472, ESD-TR, JMCIS

13. A data entry window contains the controls needed to support data entry and manipulation.  
Source: JMCIS
14. If a data entry window has more than one page, the window includes paging controls.  
Source: ESD-TR, JMCIS
15. If users have to make multiple entries, the window includes Clear and Restart controls.  
Source: JMCIS
16. If push buttons are used in a data entry window, they are separate from the main body of the window and at the bottom.  
Source: MSG, JMCIS
17. Users can obtain information about a data field and its contents.  
Source: MS1472, ESD-TR, MSG, AFSSC, JMCIS
18. Data field names are unique; the same names are applied throughout the application.  
Source: MS1472, ESD-TR, AFSSC, JMCIS
19. Data fields are identified as mandatory or optional; optional fields are labeled as such.  
Source: MS1472, ESD-TR, DODIIS, DODSG, AFSSC, JMCIS
20. Data fields are text fields (users type) or option menus (users select).  
Source: JMCIS  
Developer Note: A drop down combination box (see Figure 9-1) may be used to allow users to type into a text area or select a discrete value from a menu. This is a non-standard widget.
21. Data fields with values that cannot be changed are in an information-only area.  
Source: JMCIS



**Figure 9-1. Drop Down Combination Box**

## 9.2.2 Data Entry and Manipulation

1. The same set of actions to enter/manipulate data are used throughout the application.  
Source: MS1472, ESD-TR, JMCIS
2. The text cursor is placed with the pointing device and moved with the keyboard/pointing device.  
Source: MS1472, ESD-TR, MSG, DODIIS, DODSG, AFSSC, JMCIS
3. When a window has input focus, the text cursor shall appear in the text area where the typing is most likely to occur and at the beginning of whatever text appears in the area.  
Source: MSG  
Developer Note: When a window is initially opened a textfield widget can be set to have keyboard focus by using `XmProcessTraversel ()`. However, when an open window receives input focus the cursor should be set in the last field that had input focus before it was lost. See also Section 6.1.3.1 , Prompt Windowing.
4. When the Select button is clicked in a text area, the text cursor shall appear at the location of the pointer and the pointer shall remain displayed.  
Source: MSG, JMCIS
5. The pointer shall disappear from the screen when users begin typing and shall reappear when users stop typing or move the pointing device.  
Source: MSG, JMCIS
6. The pointer shall be an I-beam shape only when users move the pointer into an area where the text entry is possible.  
Source: MSG, AFSSC, JMCIS
7. The text cursor shall only be allowed to be placed in areas where the text entry is possible.  
Source: MSG, JMCIS
8. The text entry shall not be possible when the text cursor is not visible and shall only be possible when the text cursor is visible.  
Source: MSG, JMCIS
9. Applications shall ensure that the text cursor is highly visible when it appears in a text entry area.  
Source: JMCIS
10. Editing commands such as Cut/Copy and Paste shall be available if these commands shall facilitate the text entry process.  
Source: MSG, JMCIS
11. The default for text entry shall be insert mode.  
Source: MSG, JMCIS

12. The <Insert> key shall toggle between insert and replace mode in a text field. The User Interface Specifications for the JMCIS states that binding the toggle capability to the <Insert> key can be done by adding the following lines to the .Xdefaults file:

```
*XmText.translations: #override\n\
: <Key>osfInsert: toggle-overstrike()
*XmTextField.translations: #override\n\
: <Key>osfInsert: toggle-overstrike()
```

Source: MSG, JMCIS

13. When variable information is entered in a text field, it shall be automatically justified. Text shall be left-justified. Numeric data shall be right-justified.  
Source: MSG, AFSSC, JMCIS
14. Leading characters shall not be required to fill data entry space.  
Source: MSG, JMCIS
15. It shall be capable to enter numeric data via the keyboard and the numeric keypad.  
Source: JMCIS
16. Users shall not have to enter the unit of measurement associated with a numeric value.  
Source: DODSG, JMCIS
17. Users shall move the text cursor between text fields by pressing <TAB> or the arrow keys.  
Source: MSG  
Developer Note: The <RETURN> and <ENTER> keys shall not be used to move the text cursor since these keys are used to execute the default action in a window.
18. Applications shall not automatically tab to the next field.  
Source: MSG
19. When the text cursor is tabbed to the next field, it shall appear on the left end of the field.  
Source: JMCIS
20. When the text cursor is tabbed to the next field and it already contains text, the text shall be highlighted.  
Source: JMCIS
21. Users shall also be able to place the text cursor in any of the text in a text field by positioning the pointer and pressing the select button.  
Source: JMCIS
22. The size of the text cursor shall change to match the size of the text font in which it is placed.  
Source: JMCIS

23. In a multi-lined text field, the arrow keys on the keyboard shall move the text one increment (i.e., one line or one character) in the specified direction.  
Source: JMCIS
24. In a multi-lined text field, the <Ctrl> key in combination with the arrow keys shall move the slider one large increment (i.e., one word or one paragraph) in the specified direction.  
Source: JMCIS
25. In a multi-lined text field, the <Begin> and <End> keys shall move the text cursor to the beginning and end of a line.  
Source: JMCIS
26. In a multi-lined text field, <Ctrl> <Begin> and <Ctrl> <End> shall move the text cursor to the beginning and end of the text.  
Source: JMCIS
27. If multi-line text is in a window with a default action, <Enter> or <Ctrl> <Return> shall execute the default action.  
Source: JMCIS
28. Users can back up to any field and change it prior to entering data into the system.  
Source: JMCIS
29. A validity check is done on data entered, with visual and/or auditory error messages.  
Source: JMCIS
30. Data is entered with explicit action, e.g., Enter menu option, Apply/OK push button.  
Source: JMCIS
31. If appropriate, the application provides feedback to users to indicate successful data entry.  
Source: JMCIS
32. Users can enter data into the system at any time during data entry.  
Source: JMCIS

### **9.2.3 Data Query**

1. The data query language provided to the users reflects the structure of the data as perceived by the users.  
Source: JMCIS
2. The language allows the users to specify the data to retrieve, then display and manipulate it.  
Source: JMCIS
3. Users can request data without having to tell the system how to find it.  
Source: JMCIS

4. Queries use operationally meaningful terminology and do not reflect how the data are stored.  
Source: JMCIS
5. Users can construct simple/complex, predefined queries and save/retrieve/execute.  
Source: DODSG, JMCIS
6. The language permits alternate forms of the same query using natural language.  
Source: DODSG, JMCIS
7. Users are prompted to confirm a query if data retrieval time will be excessive.  
Source: JMCIS

### **9.3 TEXT WINDOWS**

1. A text window is wide enough to display an entire line of text without scrolling.  
Source: JMCIS
2. A text window includes vertical scroll bars, and indicator of the current location in the document.  
Source: JMCIS  
Developer Note: With the advent of the scroll bar the page distinction has become blurred. However, data entry tasks are sometimes accomplished using "hard copy" pages. In this case, the multiple page distinction can be maintained. A combination scroll bar and scale widget can be combined so the scroll bar can be used to scroll through an individual page and the scale can be used to change pages. Using buttons to page forward, backward, the beginning and to the end can also be used but this is less efficient from a HCI point of view. See also Section 9.2.1 and 9.4.
3. Users can save, access, retrieve, rename, and print the document.  
Source: JMCIS
4. Users can specify the portions of the document to be printed and the printer.  
Source: JMCIS
5. The system acknowledges the print command and provides the status of the printer and queue.  
Source: JMCIS

#### **9.3.1 Text Manipulation**

1. Users can easily specify the format of a document and the font type, size, and style.  
Source: JMCIS
2. Automatic line break and word-wrap at the right margin are available.  
Source: JMCIS
3. Automatic pagination (page numbers based on the number entered by users) is available.  
Source: JMCIS

4. The window is formatted as the printed output, or there is an option to see this format.  
Source: JMCIS
5. A copy of the original document is retained until users confirm that it is to be changed.  
Source: JMCIS
6. The original document is not modified automatically as users make each editing change.  
Source: JMCIS
7. Applications provide both search and search/replace capabilities for users.  
Source: JMCIS
8. Search: Users type the text string (not case-sensitive); the first instance is highlighted.  
Source: JMCIS
9. Search/replace: Users type text string to be searched, and change if desired (is case-sensitive).  
Source: JMCIS

## **9.4 TABULAR DATA WINDOWS**

### **9.4.1 Tabular Data Window Design**

1. Tabular data windows are used for information display only.  
Source: JMCIS
2. Columns in a tabular data window shall be composed of individual single-columned list boxes (see Figure 9-2).  
Developers Note: Using many single-columned list boxes is a tradeoff over using a multi-columned list box and should be used where columns may be of variable length, justified in different ways, or data in the table can be sorted by the user. Single-columned list boxes are used to accommodate left justification for alphanumeric data, right justification for numeric data and justification of decimal points. Single-columned list boxes also accommodate data of variable lengths.
3. Individual single-columned list boxes in a tabular data window shall be linked so that selecting an individual item in one list also selects the data in the corresponding line of all the lists.
4. Individual single-columned list boxes in a tabular data window shall be linked so that each list box shall be scrollable by means of one scroll bar which is located on the rightside of the right-most list box.
5. The width of each single-columned list box shall be the same width of the column label.

6. If the width of the longest data element in a list is unknown or is variable, horizontal scroll bars shall be used for individual columned list boxes. However, horizontal scroll bars shall only be displayed when needed.  
Developer Note: Individual columnar scroll bars shall be displayed under the list rather than in the list.
7. If the data covers several pages, the pages are numbered and include push buttons for paging.  
Source: JMCIS  
Developer Note: With the advent of the scroll bar the page distinction has become blurred. However, data entry tasks are sometimes accomplished using "hard copy" pages. In this case, the multiple page distinction can be maintained. A combination scroll bar and scale widget can be combined so the scroll bar can be used to scroll through an individual page and the scale can be used to change pages. Using buttons to page forward, backward, the beginning and to the end can also be used but this is less efficient from a HCI point of view. See also Section 9.2.1 and 9.3.
8. Column labels are identical for all pages; the last line on a page is the first line on the next page.  
Source: JMCIS
9. Users sort records in a tabular data window by selecting the check box toggle buttons in column heading. The XmNshadowThickness shall be set to two.  
Developer Note: The sort check box toggle buttons shall be the same width as the single-columned list box and shall touch the adjacent sort check box toggle button. The sort check box labels shall be left-justified (see Figure 9-2).
10. When selected, the check box remains highlighted to indicate the column that was sorted.
11. If multiple sorts are required in a tabular data window, a non-editable field shall be provided to display the order of the sort criteria. Column labels shall be placed in the non-editable field in the order in which the column label push buttons were chosen. When a column label check box is de-selected, the check box label shall be removed from the sort-order field.

Sorted by: MsgID, Modified, Class

Msg Name	Msg ID	Modified	Class	Comments	Valid	To
Outgoing Message Box						
Message1	WISREP	141505Z JUN 91	U	Genr Visit	*	Headquarters
Message2	TARBUL	142505Z JUN 91	U	Target Stuff	*	Commandcenter
Message3	ATOCONF	122533Z DEC 92	U	Squadron X		
Message12	TARBUL	142505Z JUN 92	U			
Message15	ATOCONF	122533Z DEC 92	U			
GenAdmin Messages						
Mymessage	GENADMIN	141505Z JUN 91	U	None	*	Headquarters
JMPMsg	GENADMIN	142505Z JUN 92	U	None	*	RHJIBCI/CCOM1
Victor	GENADMIN	122533Z DEC 92	U	Program X	*	Langley

Figure 9-2. Tabular Data Window

#### 9.4.2 Tabular Data Window Content

1. Each tabular data column has a label.  
Source: ESC-TR, MS1801, JMCIS
2. Tabular data columns composed of individual single-columned list boxes are separated by 0, 1, or 2 pixels.
3. Data groupings are indicated by blank space, separator lines, and/or different intensity.  
Source: JMCIS
4. Multiple colors are used only if the colors provide additional meaning.  
Source: JMCIS
5. A blank space is inserted after every third to fifth row and column of tabular data.  
Source: JMCIS  
Developer Note: Multiple colored background bars may also be used. The color chosen should provide enough contrast with the text so that it is readable and not so saturated as to cause eye fatigue.

6. Left-justify alphabetic data; right-justify integers; justify decimal data on decimal point.  
Source: JMCIS  
Developer Note: Data justification is simplified if the table columns are composed of individual single-columned list boxes.
7. Long strings of numbers are delimited with spaces, commas, or slashes (not leading zeros).  
Source: JMCIS
8. If a data record extends beyond a line, additional lines are identified as continuations.  
Source: JMCIS
9. Tabular data are arranged to show similarities, differences, trends, or relationships.  
Source: JMCIS
10. Data that are important, require immediate response, and/or are frequent at the top.  
Source: JMCIS
11. If the data extends across several pages, related data are placed on the same page.  
Source: JMCIS
12. The format for the data display is compatible with the format used for data entry.  
Source: JMCIS
13. The ordering and layout of corresponding fields is consistent and has the same names.  
Source: JMCIS

## **9.5 GRAPHIC DISPLAY WINDOWS**

### **9.5.1 Graphic Display Window Design**

1. The window includes a title and is sized so that the entire graphic display is visible  
Source: JMCIS.
2. Users do not have to scroll or resize a graphic display window to view its contents.  
Source: JMCIS
3. The graphic is displayed in the main drawing area with a minimum size of 640 X 480 pixels.  
Source: JMCIS
4. If the reference window area is used it has an inset of main graphic, and the minimum size is 160 X 120 pixels.  
Source: JMCIS
5. If used, the application information area is the same width as the main area, and the maximum is five text lines tall.  
Source: JMCIS

6. If used, the graphics information area is the same height as the reference window, and fills the area to the left.  
Source: JMCIS

#### **9.5.1.1 Line Graphs**

1. Line graphs shall be used for trends and for spatial, time-critical, or imprecise information.  
Source: JMCIS
2. The axes of the graph shall be clearly labeled and include the unit of measurement as appropriate.  
Source: JMCIS
3. The labels are in mixed-case letters and oriented left to right for normal reading.  
Source: JMCIS
4. Minimum/maximum values are shown on each axis, with up to nine intermediate markings.  
Source: JMCIS
5. The starting point of an axis is 0, with the gradations indicated in whole numbers unless 0 is an inappropriate starting point and whole numbers are also inappropriate.  
Source: JMCIS
6. Gradations are standard intervals; intervening gradations are consistent with the labeled scale.  
Source: JMCIS
7. Labels are used instead of legends or keys to identify the data.  
Source: JMCIS
8. The labels are oriented horizontally and located next to the data being referenced.  
Source: JMCIS
9. Each line or curve on a graph is labeled and coded and critical or abnormal data is coded.  
Source: JMCIS
10. Gridlines are unobtrusive and do not obscure the data presented in the graph.  
Source: JMCIS
11. Users can display or suppress gridlines as desired.  
Source: JMCIS
12. The same coding scheme is used consistently within an application.  
Source: JMCIS
13. Multiple trend lines are presented on a single graph.  
Source: JMCIS

14. Users can re-draw multiple graphs using the same scale to facilitate comparison.  
Source: JMCIS
15. For precise values, users can display the actual values on the graph and to zoom.  
Source: JMCIS

#### **9.5.1.2 Bar Charts and Histograms**

1. Bar charts are used to show several intervals; histograms are used to show a large number or intervals.  
Source: DODSG, JMCIS
2. Bar graphs have a consistent orientation; comparable bars are adjacent.  
Source: DODSG, JMCIS
3. When displayed data are compared with a critical value, a reference index is provided.  
Source: JMCIS
4. The design of a bar chart or histogram conforms to user expectations.  
Source: DODSG, JMCIS
5. Icons are not used to represent quantitative information.  
Source: JMCIS
6. Charts and axes are clearly labeled, and important information is highlighted.  
Source: JMCIS
7. When bars are presented in pairs, they are labeled as a unit and include a legend.  
Source: JMCIS

#### **9.5.1.3 Flow Charts**

1. Flow charts are used for a schematic representation of sequences or processes.  
Source: JMCIS
2. The steps in a flow chart are presented in a logical order.  
Source: JMCIS
3. If there is no inherent logic, the steps are ordered to minimize the size of the flow chart.  
Source: JMCIS
4. The path indicated in the flow chart is left-to-right, top-to-bottom, or clockwise.  
Source: JMCIS
5. Each decision point in the flow chart contains a single, simple decision.  
Source: JMCIS
6. The flow chart elements and lines are consistently coded to assist in understanding.  
Source: JMCIS

7. The flow chart provides direction indicators to indicate the sequence to be followed.  
Source: JMCIS
8. A legend describes each element and code; critical information and/or steps highlighted.  
Source: JMCIS

### **9.5.2 Manipulation of Graphical Data**

1. Users can select/edit object attributes, change sizes, and fill areas with color/patterns.  
Source: JMCIS
2. Applications automatically align, complete figures, and draw between user-specified points.  
Source: JMCIS
3. Users can draw objects such as lines, rectangles, ovals, and arcs.  
Source: JMCIS
4. Objects emerge as they are drawn and are easy to reposition, duplicate, and delete.  
Source: JMCIS
5. Users can group separate objects into a single object.  
Source: JMCIS
6. Objects are displayed as they will be printed (or an option is available to see this format).  
Source: JMCIS
7. Original graphics are retained until users confirm that the objects are to be changed.  
Source: JMCIS
8. The objects are not modified automatically, users can change them.  
Source: JMCIS

## **9.6 MAP WINDOWS**

### **9.6.1 Map Window Design**

1. Map controls appear in the map window or are available in separate dialog windows.  
Source: JMCIS  
Developer Note: A tear-off menu can be used as a compromise between saving screen space and making controls readily available.
2. A map window includes identifying information about map and status information. This information includes map name, coordinates, area, and/or scale.  
Source: DODSG, JMCIS
3. Identifying/status information appears in the window area or along the bottom window margin.  
Source: JMCIS

4. A continuous indicator of pointer location on the map is available in the standard window area.  
Source: JMCIS
5. Maps are displayed throughout the application using the same orientation (e.g., north as up), and the important features are labeled.  
Source: DODSG, JMCIS
6. Labels are positioned consistently (next to or below) with respect to features. Labels should not obscure information and should remain legible at all map resolutions.  
Source: DODSG, JMCIS
7. When displaying color overlays, a color-coding key is also displayed in a sub-area of the map or in a separate dialog window.  
Source: DODSG, JMCIS
8. Users can display the coding key as desired without having to redisplay the overlay.  
Source: JMCIS
9. A dialog window displaying a coding key is the minimum size and obscures little of the overlay.  
Source: JMCIS
10. If appropriate, the coding key is a scale so users can interpret the coding in the overlay.  
Source: JMCIS
11. Symbols are placed on the map accurately or connected to the map with graphics.  
Source: JMCIS
12. If multiple symbol sets are available, users can select a set without losing data.  
Source: JMCIS
13. Symbol labels appear next to the symbol and present essential information about it.  
Source: JMCIS
14. The background of the symbol and label are transparent in order to not obscure other information.  
Source: JMCIS

### **9.6.2 TBM Specific Map Symbols**

The following documents shall be applicable to TBM systems:

1. Workbook of Weather Maps by John J. Hidore
2. Army Field Manual FM 101-5-1, Operational Terms and Symbols  
Source: DODSG
3. NATO Standardization Agreement (STANAG) 2019, Military Symbols for Land-Based Systems  
Source: DODSG

4. DIA Standard Military Graphics Symbol (SMIGS) Manual  
Source: DODSG

### **9.6.3 Map Manipulation**

1. Users can pan and zoom a map as desired.  
Source: DODSG, JMCIS
2. Position or change indicators are provided to return quickly to the normal/starting map.  
Source: DODSG, JMCIS
3. When a map is zoomed, size of symbols, labels, and features are adjusted to be readable.  
Source: DODSG, JMCIS
4. Users can define a baseline or home position on a map and return to this position quickly.  
Source: DODSG, JMCIS
5. Users shall be able to place a map window where desired, define the appearance of the map, select the objects which will appear on the map, and change the appearance of critical tactical information on the map.  
Source: JMCIS
6. Users can add, edit, reposition, delete, and determine distance/bearing between points.  
Source: JMCIS
7. Latitude and longitude can be entered to the level of accuracy needed.  
Source: JMCIS
8. Calculations (e.g. range, bearing, position) reflect accuracy appropriate to the scale.  
Source: JMCIS
9. Users can select and deselect symbols on the map using standard selection methods.  
Source: JMCIS
10. Users can view or declutter, and obtain additional information for selected symbols.  
Source: JMCIS
11. The intensity of the map is adjustable to fade out without losing all map features.  
Source: JMCIS
12. Users can distinguish coincident point symbols and obtain ambiguity information.  
Source: JMCIS
13. Users can select categories for automatic update, frequency, and rate of update. If appropriate, users can temporarily stop and then resume further updates.  
Source: JMCIS

## **9.7 MESSAGE HANDLING WINDOWS**

### **9.7.1 Message Preparation**

1. Message preparation windows follow the same design as data entry windows.  
Source: JMCIS
2. Users are given basic message header fields that are supported in specifying the message address.  
Source: JMCIS
3. Option menus are available for selecting from limited sets of frequently used terms.  
Source: JMCIS
4. When replying to a message, the appropriate addressee(s) are provided automatically.  
Source: JMCIS
5. If functionally is required by an application, users shall have the capability to build and maintain lists of common addresses and select from these lists when preparing messages.  
Source: JMCIS
6. If functionally is required by an application, addresses are checked prior to transmission; users can correct errors before sending.  
Source: JMCIS
7. Preformatted standard forms are available and format control during entry is automatic.  
Source: JMCIS
8. Users can specify data, incorporate data files, and save during preparation/completion.  
Source: JMCIS

### **9.7.2 Message Transmission**

1. Message transmission procedures are designed to minimize the user actions required.  
Source: JMCIS
2. Users can initiate message transmission directly (e.g., select a transmit push button) or can set a transmission time.  
Source: JMCIS
3. If a message cannot be sent immediately, it is queued automatically.  
Source: JMCIS
4. If functionally is required by an application, users can assign message priorities and cancel or abort a transmission.  
Source: JMCIS
5. Status feedback is available that confirms messages sent and indicates failures.  
Source: JMCIS

6. Users can specify feedback wanted; an automatic log is maintained.  
Source: JMCIS
7. If functionally is required by an application, undelivered messages are saved in the event that there is transmission failure.  
Source: JMCIS

### **9.7.3 Message Receipt**

1. Users are informed when high-priority messages are received.  
Source: JMCIS
2. Message notification does not interfere, but provides some indication of urgency.  
Source: JMCIS
3. If functionally is required by an application, incoming messages are automatically queued by time and priority; logs are maintained.  
Source: JMCIS
4. Users can review summary information, display messages, save/file, and discard.  
Source: JMCIS
5. A message is displayed in a text window; users can scroll, save, and print it.  
Source: JMCIS
6. During login, a system provides users with a list of new messages received.  
Source: JMCIS
7. During session, a system activates an alert indicator to inform users of priority messages.  
Source: JMCIS

### **9.8 LIST-TO-LIST TRANSFER**

1. A task window used to copy items from a source list (master list) to a destination list shall provide one Add and one Remove button (Figure 9-3).  
Developer Note: The labels Add and Remove may be altered to more closely fit the task that the list-to-list transfer is being used.
2. The Remove button shall be enabled and the Add button shall be disabled if an item in the destination list is the only selected item.
3. The Add button shall be enabled and the Remove button shall be disabled if an item in the source list is the only selected item.
4. Items in the source list that have been added to the destination list shall be displayed with a dash to the preceding list item (Figure 9-3).
5. The user shall not be allowed to remove an item from the source list.

6. The user shall not be allowed to add two instances of a single item in the source list into the destination list.
7. Moving an item from the source list to the destination list in this type of dialog box shall not permanently remove the item from the source list.

### **9.9 FIND WINDOW**

1. A task window used to find text shall allow the user to select whether the search is case-sensitive (see Figure 9-4).
2. The user shall be able to specify whether the search must match the entire word being searched on or if partial string matches are allowed.
3. The user shall be able to specify the direction of the search relative to the current position.
4. The user shall be able to cancel the find operation at any time.

### **9.10 FIND AND REPLACE WINDOW**

1. A task window used to find and replace text shall allow the user to select whether or not the search is case-sensitive (see Figure 9-5).
2. The user shall be able to specify whether the search must match the entire word being searched on or if the partial string matches are allowed.
3. The user shall be able to specify the direction of the search relative to the current position.
4. The user shall be able to replace matches individually or globally replace all matches found.
5. The user shall be able to choose not to replace any given instance of a match.
6. The user shall be able to cancel the find and replace operation at any time.

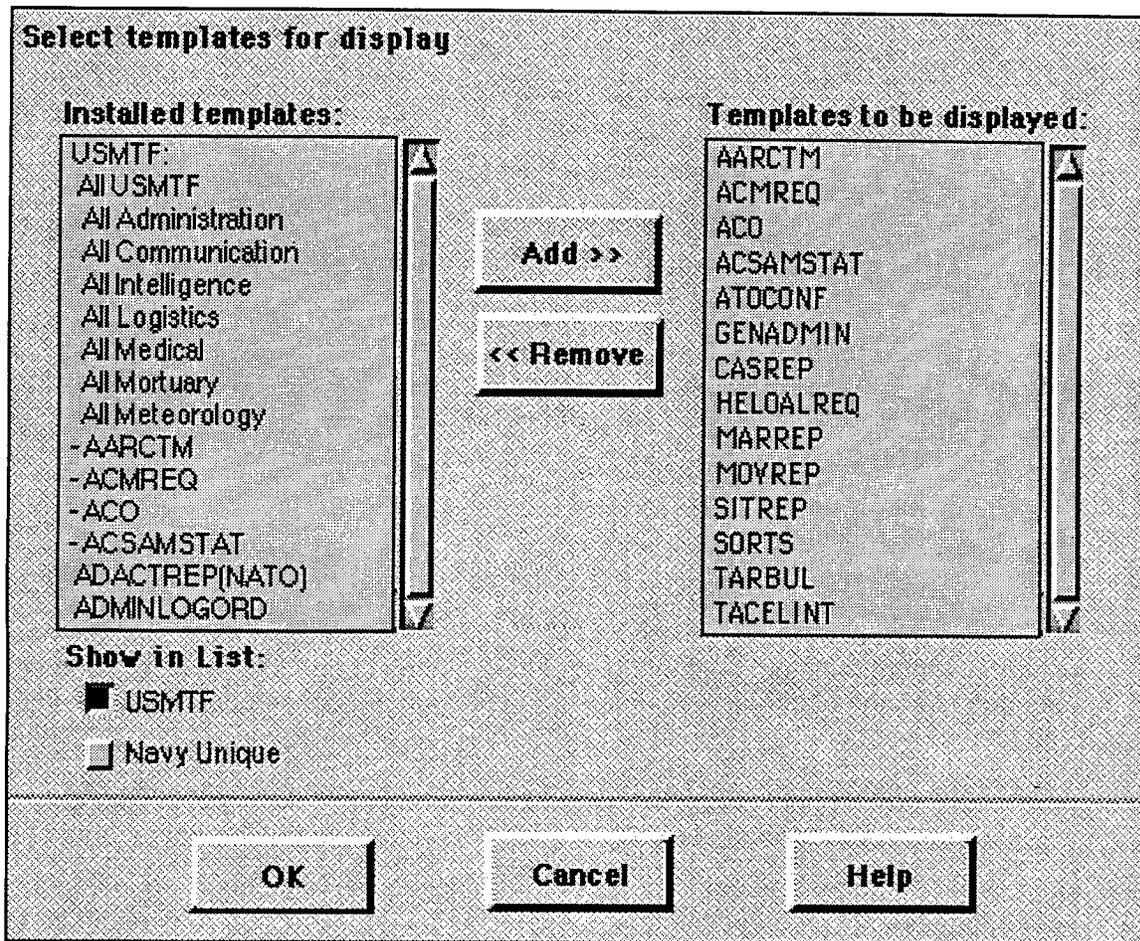


Figure 9-3. List-to-List Transfer Window

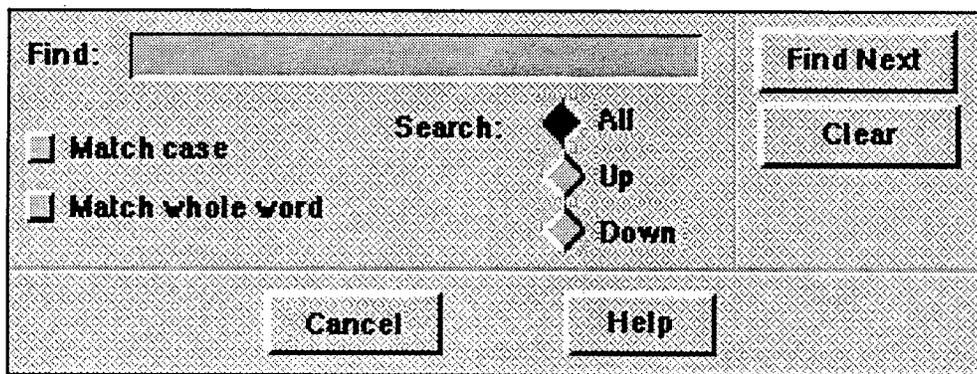


Figure 9-4. Find Window

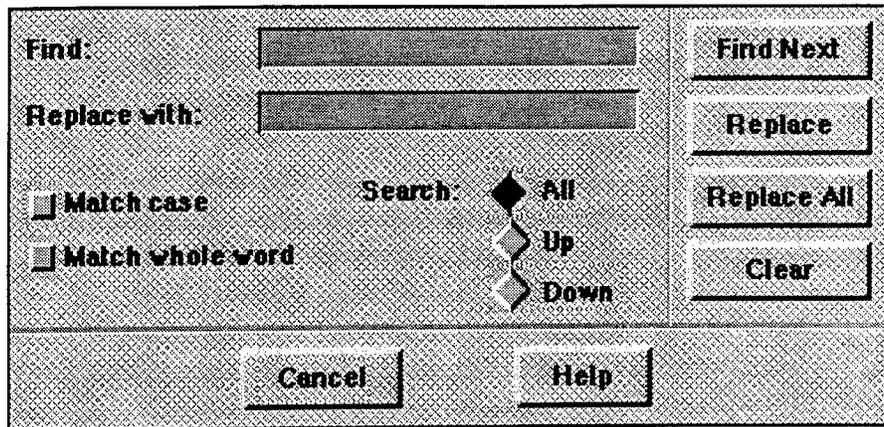


Figure 9-5. Find and Replace Window

### 9.11 SPELL CHECKING WINDOW

1. A task window used to perform spell checking on a text document or message segment shall display the unknown word to the user in an uneditable text field (see Figure 9-6).
2. The unknown word shall also appear in an editable text field so that the user can edit the unknown word.
3. The system shall provide a default dictionary of common words, abbreviations, etc., used in the application. This dictionary shall be tailored for the application task.
4. The user shall be able to ask for suggestions on how to correct the unknown word from the dictionary.
5. The user shall be able to select a word from the list of suggestions and have the option of editing the word before replacing the unknown word.
6. The user shall have the option of replacing all instances of a given unknown word with the specified corrected word or replacing each instance individually. If a user chooses to globally replace all instances of a given unknown word, the spell checker shall automatically replace the word without acknowledgement from the user and not interrupt the spell checking process.
7. The user shall be allowed to skip an unknown word without changing it.
8. The user shall be given the option to skip all instances of an unknown word for the remainder of the document or to skip the current instance only.
9. The user shall be able to specify the direction of the spell check relative to the current position.

10. The user shall be able to cancel the spell check operation at any time.

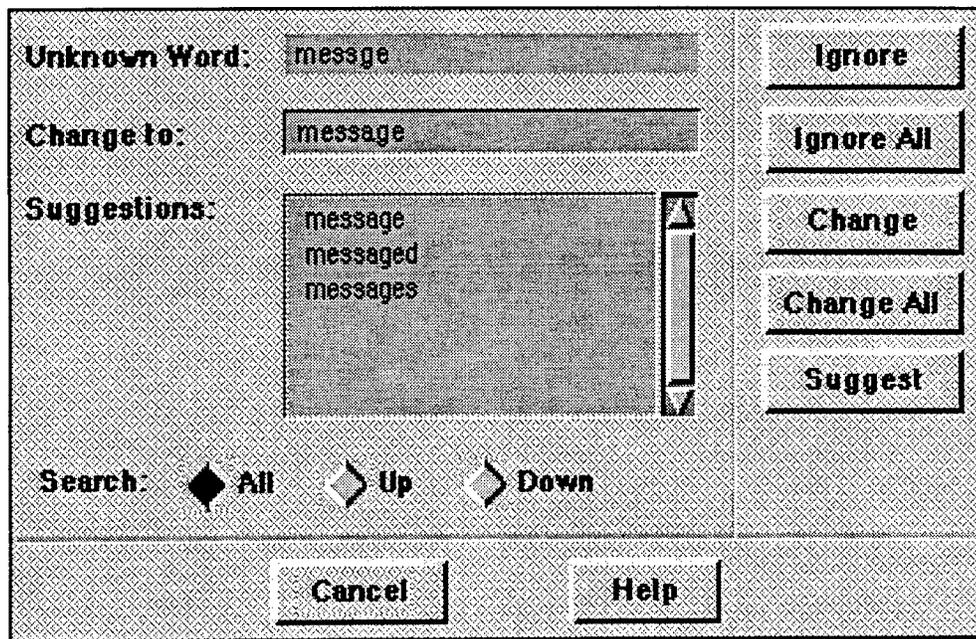


Figure 9-6. Spell Checking Window

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## APPENDIX A

### TBM MOTIF WIDGET RESOURCE SETTINGS

The contents of this appendix are derived from version 1.2 of the User Interface Specifications for Navy Command and Control Systems. The intent is to provide the Motif resource settings that implement the "look and feel" called for by the user interface specifications presented in this document. The appearance and behavior of the Motif window manager and the appearance of the Motif primary widgets are specified. A resource setting is specified as either a unique setting, a default setting, or a setting recommended by Kobara in Visual Design with OSF/Motif. Resource files shall comply with the settings presented in this appendix.

The following colors (and RGB values) are specified in this document:

#### System Window

<i>Component</i>	<i>Color</i>	<i>R</i>	<i>G</i>	<i>B</i>
Background	LightGray	211	211	211
Text	Black	0	0	0

#### System Window Classification Area

<i>Classification</i>	<i>Color</i>	<i>R</i>	<i>G</i>	<i>B</i>
Unclassified	MediumSeaGreen	60	179	113
Confidential	SkyBlue	135	206	235
Secret	Firebrick2	238	44	44
Top Secret	DarkOrange	255	140	0
Text	Black	0	0	0

#### System Window Menu Bar

<i>Component</i>	<i>Color</i>	<i>R</i>	<i>G</i>	<i>B</i>
Background	SkyBlue	135	206	235
Available Options	Black	0	0	0
Unavailable Options	Gray	192	192	192

#### Application Window Title Bar

<i>Component</i>	<i>Color</i>	<i>R</i>	<i>G</i>	<i>B</i>
<i>Active Window</i>				
Background	DarkSlateBlue	72	61	139
Text	Black	0	0	0
<i>Inactive Window</i>				
Background	LightBlue	173	216	230
Text	LightGray	211	211	211

Application Window Color	Objects		
	R	G	B
DarkSlateBlue	72	61	139
Black	0	0	0
LightBlue	173	216	230
LightGray	211	211	211
Gray	192	192	192
SlateGray	112	128	144
Azure2	224	238	238
LightBlue3	104	131	139

**Table A-1. Resources and Settings for Motif Window Manager and Motif Widgets**

Resource	Setting	Source
<u>Appearance of Window Manager Components</u>		
(Mwm resources specified in .xdefaults file must have a colon following the resource)		
Mwm*background:	LightBlue	Navy C2 specs
Mwm*bottomShadowColor:	Dynamic	Default
Mwm*foreground:	LightGray	Navy C2 specs
Mwm*topShadowColor:	Dynamic	Default
Mwm*activeBackground:	DarkSlateBlue	Navy C2 specs
Mwm*activeBottomShadowColor:	Dynamic	Default
Mwm*activeForeground:	LightGray	Navy C2 Specs
Mwm*activeTopShadowColor:	Dynamic	Default
Mwm*client*background:	LightBlue	Navy C2 specs
Mwm*client*foreground:	Black	Navy C2 specs
Mwm*feedback*background:	LightBlue	Navy C2 specs
Mwm*feedback*foreground:	Black	Navy C2 specs
Mwm*menu*background:	LightBlue	Navy C2 specs
Mwm*menu*foreground:	Black	Navy C2 specs
<u>Window Manager Behavior</u>		
Mwm*autoKeyFocus:	True	JMCIS
Mwm*buttonBindings:	"DefaultButtonBindings"	Default
Mwm*cleanText:	True	Default
Mwm*clientAutoPlace:	False	Navy C2 specs
Mwm*clientDecorstions:	All	JMCIS

Table A-1. Continued

Resource	Setting	Source
<u>Window Manager Behavior</u>		
Mwm*colormapFocusPolicy:	Keyboard	Default
Mwm*deiconifyKeyFocus:	True	Default
Mwm*enforceKeyFocus:	True	Default
Mwm*fadeNormalIcon:	True	Navy C2 specs
Mwm*focusAutoRaise:	True	TBM
Mwm*frameBorderWidth:	6	Kobara
Mwm*iconAutoPlace:	True	Default
Mwm*iconClick:	True	Default
Mwm*interactivePlacement:	False	Default
Mwm*keyBindings:	"DefaultKeyBindings"	Default
Mwm*keyboardFocusPolicy:	Explicit	Default
Mwm*limitResize:	True	Default
Mwm*lowerOnIconify:	False	JMCIS
Mwm*moveThreshold:	4	Default
Mwm*multiScreen:	True	Navy C2 specs
Mwm*passButtons:	True	Navy C2 specs
Mwm*passSelectButton:	True	Default
Mwm*positionIsFrame:	False	JMCIS
Mwm*positionOnScreen:	False	JMCIS
Mwm*raiseKeyFocus:	False	Default
Mwm*resizeBorderWidth:	7	Kobara
Mwm*resizeCursors:	True	Default
Mwm*showFeedback:	All	Default
Mwm*startupKeyFocus:	True	Default
Mwm*traversalOn:	True	Default
Mwm*userClientIcon:	False	Default
Mwm*useIconBox:	False	Default
Mwm>windowMenu:	"DefaultWindowMenu"	Default
Mwm*wMenuButtonClick:	True	Default
Mwm*wMenuButtonClick2:	True	Default
<u>Icon Appearance</u>		
Mwm*iconDecoration:	label image	Default
Mwm*iconImageMaximum:	50 X 50	Default
Mwm*iconImageMinimum:	16 X 16	Default
Mwm*iconPlacement:	Left/Bottom	Default
Mwm*icon*background:	LightBlue	Navy C2 specs
Mwm*icon*foreground:	Black	Navy C2 specs

Table A-1. Continued

Resource	Setting	Source
<b>RESOURCE SETTINGS FOR MOTIF WIDGETS</b>		
<u>General Settings</u>		
*background	LightBlue	Navy C2 specs
*cursor	Left_ptr	Navy C2 specs
*fontList	9 X 15bold, 8 X 13bold recommended	Navy C2 specs
*foreground	Black	Navy C2 specs
*pointerColor	Black	Navy C2 specs
<u>ArrowButton</u>		
XmNbackground	SlateGray	Navy C2 specs
XmNbottomShadowColor	Dynamic	Default
XmNheight	24	TBM
XmNhighlightThickness	2	Default
XmNshadowThickness	2	Default
XmNtopShadowColor	Dynamic	Default
XmNwidth	24	TBM
<u>BulletinBoard</u>		
XmNallowOverlap	False	Kobara
XmNmarginHeight	2	Kobara
XmNmarginWidth	2	Kobara
<u>CascadeButton (in a Menubar)</u>		
XmNbackground	LightBlue (or color of menubar if menubar is used for application differentiation).	Navy C2 specs
XmNbottomShadowColor	Dynamic	Default
XmNforeground	Black	Navy C2 specs
XmNmarginHeight	2	Default (Kobara)
XmNmarginWidth	8	Kobara
XmNmnenonic	Not NULL	JMCIS
XmNshadowThickness	2	Default
XmNtopShadowColor	Dynamic	Default
<u>CascadeButton (in a Pull Down or Pop-up Menu)</u>		
XmNbackground	LightBlue for Pull Down (or color of menubar if menubar is used for application differentiation).	Navy C2 specs

Table A-1. Continued

Resource	Setting	Source
<u>CascadeButton</u> (in a Pull Down or Pop-up Menu)		
XmNbottomShadowColor	Dynamic	Default
XmNforeground	Black	Navy C2 specs
XmNmappingDelay	180	Default
XmNmarginHeight	2	Default (Kobara)
XmNmnemonic	Not NULL	JMCIS
XmNshadowThickness	2	Default
XmNtopShadowColor	Dynamic	Default
<u>DrawnButton</u>		
XmNhighlightHeight	2 if XmSHADOW_IN or XmSHADOW_OUT; otherwise use 0	Navy C2 specs
XmNshadowThickness	2	Default (Kobara)
<u>Frame</u>		
XmNbackground	LightBlue	Navy C2 specs
XmNbottomShadowColor	Dynamic	Default
XmNmarginHeight	Not 0	Kobara
XmNmarginWidth	Not 0	Kobara
XmNshadowThickness	2 recommended for Shadow In and Shadow Out frames, 1 for Etched In and Etched Out frames	Kobara
<u>Label</u>		
XmNalignment	XmALIGNMENT_BEGINNING for vertically stacked labels and labels with widgets to their left; XmALIGNMENT_END for labels with widgets to their right; otherwise XmALIGNMENT_CENTER	Kobara
XmNbackground	LightBlue	Navy C2 specs
XmNforeground	Black	Navy C2 specs
XmNmarginHeight	6	Kobara
XmNmarginWidth	2	Default (Kobara)
XmNmnemonic	NULL	Default
XmNshadowThickness	0	Default
XmNtraversalOn	False	Default

**Table A-1. Continued**

<b>Resource</b>	<b>Setting</b>	<b>Source</b>
<u>List/ScrolledList</u> (also see ScrolledWindow)		
XmNbackground	LightGray	Navy C2 specs
XmNbottomShadowColor	Dynamic	Default
XmNforeground	Black	Navy C2 specs
XmNhighlightThickness	2	Default
XmNlistMarginHeight	2	Kobara
XmNlistMarginWidth	2	Kobara
XmNlistSizePolicy	XmCONSTANT	Kobara
XmNlistSpacing	0	Default
XmNscrollBarDisplayPolicy	XmSTATIC	Kobara
XmNshadowThickness	2	Default
XmNtopShadowColor	Dynamic	Default
<u>MessageBox</u>		
XmNbackground	LightBlue	Navy C2 specs (Kobara)
XmNbottomShadowColor	Dynamic	Default
XmNforeground	Black	Navy C2 specs
XmNhighlightColor	Black	Navy C2 specs
XmNmarginHeight	10	Default
XmNmarginWidth	10	Default
XmNshadowThickness	Dynamic	Default
XmNshadowType	XmSHADOW_OUT	Default
XmNtopShadowColor	Dynamic	Default
<u>PanedWindow</u>		
XmNbackground	LightBlue	Navy C2 specs (Kobara)
XmNbottomShadowColor	Dynamic	Default
XmNmarginHeight	3	Default
XmNmarginWidth	3	Default
XmNsashHeight	6	Kobara
XmNsashIndent	Should equal the value by which vertical scrollbars are offset from the right edge of the paned window; -4 if no scrollbars are used	Kobara
XmNsashShadowThickness	Dynamic	Default
XmNsashWidth	Should equal the width of the scollbars in the application; 12 if no scrollbars used	Kobara

**Table A-1. Continued**

<b>Resource</b>	<b>Setting</b>	<b>Source</b>
<u>PanedWindow</u>		
XmNseparatorOn	True	Default
XmNshadowThickness	2	Default
XmNspacing	8	Default (Kobara)
XmNtopShadowColor	Dynamic	Default
<u>PushButton (in a Work Area)</u>		
XmNalignment	XmALIGNMENT_CENTER	Default
XmNarmColor	Gray	Navy C2 specs
XmNbackground	LightBlue (if pushbutton is in a secondary window and the menubar is used for application differentiation then background color should be the same as the application's primary menubar)	Navy C2 specs
XmNbottomShadowColor	Dynamic	Default
XmNdefaultButtonShadowThickness	0	Default
XmNfillOnArm	True	Default
XmNforeground	Black	Navy C2 specs
XmNhighlightThickness	2	Default
XmNmarginWidth	8	Kobara
XmNshadowThickness	2	Default
XmNshowAsDefault	1 recommended for default push button, otherwise 0	Kobara
XmNtopShadowColor	Dynamic	Default
<u>Push Button (in a Pull Down or Pop-up Menu)</u>		
XmNbackground	LightBlue (if pushbutton is in a secondary window and the menubar is used for application differentiation then background color should be the same as the application's primary menubar)	Navy C2 specs
XmNbottomShadowColor	Dynamic	Default
XmNfillOnArm	True	Default

**Table A-1. Continued**

<b>Resource</b>	<b>Setting</b>	<b>Source</b>
<u>Push Button</u> (in a Pull Down or Pop-up Menu)		
Xmforeground	Black	Navy C2 specs
XmNhighlightThickness	2	Default
XmNmarginHeight	2	Default
XmNmarginWidth	8	Kobara
XmNshadowThickness	2	Default
XmNtopShadowColor	Dynamic	Default
<u>RowColumn</u>		
XmNadjustLast	False	Kobara
<u>RowColumn (for Menubar)</u>		
XmNentryAlignment	XmALIGNMENT_ CENTER	Navy C2 specs
XmNentryBorder	2	Kobara
XmNorientation	XmHORIZONTAL	Default
XmNspacing	0	Default (Kobara)
<u>RowColumn (for Pull Down, Pop-up, or Option Menu)</u>		
XmNentryAlignment	XmALIGNMENT_ BEGI NNING	Default
XmNentryBorder	0	Default
XmNorientation	XmVERTICAL	Default
XmNspacing	0	Kobara
<u>Scale</u>		
XmNbackground	Same as parent background color	JMCIS
XmNbottomShadowColor	Dynamic	Default
XmNforeground	black	Default
XmNhighlightThickness	2	Default
XmNshadowThickness	2	Navy C2 specs
XmNshowValue	True	Navy C2 specs
XmNtopShadowColor	Dynamic	Default
XmNtroughColor	Dynamic	Default
<u>Scrollbar</u>		
XmNbackground	Same as parent background color	JMCIS
XmNbottomShadowColor	Dynamic	Default
XmNhighlightThickness	2	Kobara
XmNinitialDelay	250	Default

Table A-1. Continued

Resource	Setting	Source
<u>Scrollbar</u>		
XmNrepeatDelay	50	Default
XmNscrollBarHeight	16 for horizontal scrollbars	Kobara
XmNscrollBarWidth	16 for vertical scrollbars	Kobara
XmNshadowThickness	2	Default
XmNshowArrows	True	Default
XmNtopShadowColor	Dynamic	Default
XmNtroughColor	Dynamic	Default
<u>ScrolledWindow</u>		
XmNscrollBarDisplayPolicy	XmSTATIC	Kobara
XmNscrollBarPlacement	XmBOTTOM_RIGHT	Kobara
XmNscrolledWindowMargin Height	0 for scrolled list 2 for scrolled text	Kobara
XmNscrolledWindowMargin Width	0 for scrolled list 2 for scrolled text	Kobara
XmNspacing	4	Default (Kobara)
<u>Separator</u>		
XmNbackground	LightBlue	Navy C2 specs
XmNmargin	0	Default (Kobara)
XmNseparatorType	XmSHADOW_ETCHED_ IN	Kobara
XmNshadowThickness	2	Default (Kobara)
XmNtraversalOn	False	Default
<u>Text/ScrolledText(Editable)</u>		
XmNbackground	azure2	TBM
XmNforeground	Black	Default
XmNautoShowCursorPosition	True	Default
XmNblinkRate	500	Default
XmNcursorPosition Visible	True	Default
XmNeditable	True	Default
XmNwordwrap	True	Kobara
<u>Text/ScrolledText (Noneditable)</u>		
XmNbackground	LightBlue3	TBM
XmNforeground	Black	Default
XmNautoShowCursorPosition	False	Kobara
XmNblinkRate	0	Kobara
XmNcursorPosition Visible	False	Kobara
XmNeditable	False	Kobara
XmNtraversalOn	False	Kobara

**Table A-1. Continued**

<b>Resource</b>	<b>Setting</b>	<b>Source</b>
<u>TextField (With Editable Text)</u>		
XmNbackground	Azure2	Navy C2 specs
XmNblinkRate	0	Navy C2 specs
XmNbottomShadowColor	Dynamic	Default
XmNcursorPositionVisible	True	Default
XmNeditable	True	Default
XmNforeground	Black	Navy C2 specs
XmNhighlightThickness	2	Default
XmNmarginHeight	2	Kobara
XmNshadowThickness	2	Default
XmNtopShadowColor	Dynamic	Default
<u>TextField (With NonEditable Text)</u>		
XmNbackground	LightBlue4	TBM
XmNblinkRate	0	Kobara
XmNcursorPositionVisible	False	Kobara
XmNeditable	False	Kobara
XmNforeground	Black	Navy C2 Spec
XmNhighlightThickness	0	Kobara
XmNmarginHeight	2	Kobara
XmNshadowThickness	0	TBM
XmNtopShadowColor	Dynamic	Default
XmNtraversalOn	False	Kobara
<u>ToggleButton (in a Work Area)</u>		
XmNbackground	LightBlue	Navy C2 specs
XmNbottomShadowColor	Dynamic	Default
XmNfillOnSelect	True	Default
XmNforeground	Black	Navy C2 specs
XmNhighlightThickness	2	Default
XmNindicatorOn	True	Default
XmNmarginHeight	2	Kobara
XmNmarginWidth	2	Kobara
XmNselectColor	SlateGray	Navy C2 specs
XmNshadowThickness	Dynamic	Default
XmNspacing	4	Kobara
XmNtopShadowColor	Dynamic	Default
XmNvisibleWhenOff	True	Default
<u>ToggleButton (in a Pull Down Menu)</u>		
XmNbackground	LightBlue	Navy C2 specs
XmNbottomShadowColor	Dynamic	Default
XmNfillOnSelect	True	Default
XmNforeground	Black	Navy C2 specs

**Table A-1. Concluded**

<b>Resource</b>	<b>Setting</b>	<b>Source</b>
<u>ToggleButton (in a Pull Down Menu)</u>		
XmNindicatorOn	True	Default
XmNmarginHeight	2	Default (Kobara)
XmNmarginWidth	2	Default (Kobara)
XmNmnemonic	Not NULL	JMCIS
XmNselectColor	SlateGray	Navy C2 specs
XmNshadowThickness	2	Default
XmNspacing	4	Default (Kobara)
XmNtopShadowColor	Dynamic	Default
XmNvisibleWhenOff	True	TBM

## APPENDIX B

### TBM SPECIFIC ABBREVIATIONS AND ACRONYMS

ACRONYM	MEANING
A-CCP	Assistant Chief of Combat Plans
A2C2	Army Airspace Command and Control
AAA	Anti-Aircraft Artillery
AADC	Area Air Defense Commander
AAI	Army Air Interdiction
ABCCC	Airborne Battlefield Command and Control Center
ACA	Airspace Control Authority
ACC	Air Combat Command; Air Component Commander; Airspace Control Center
ACP	Ammunition Control Point
ACS	Air Control Squadron
ADA	Air Defense Artillery
ADAFCO	Air Defense Artillery Fire Coordination Officer
ADIZ	Air Defense Identification Zone
ADS	Airspace Deconfliction System
ADWN	Air Defense Warning Network
ADWT	Air Defense Warning Technician
AE	Aeromedical Evacuation
AEACS	Airborne Elements of the Air Control System
AF	Air Force
AFAC	Airborne Forward Air Controller
AFARN	Air Force Air Request Net
AFEWC	Air Force Electronic Warfare Center
AFFOR	Air Force Forces
AFIC	Air Force Intelligence Command
AFOSI	Air Force Office of Special Investigations
AFSOB	Air Force Special Operations Base
AGE	Aerospace Ground Equipment
AI	Air Interdiction
ALO	Air Liaison Officer
AMB	Airspace Management Branch
AME	Air Mobility Element
AOB	Air Order-of-Battle
AOC	Air Operations Center
AOG	Air Operations Group
AOO	Air Operations Order
AOR	Area of Responsibility
APPS	Analytical Photogrammetric Positioning System
APS	Advanced Planning System
ARLO	Air Reconnaissance Liaison Officer
ARRS	Air Rescue and Recovery Service
ASC	Air Surveillance Coordinator
ASO/AST	Air Surveillance Officer/Air Surveillance Technician
ASOC	Air Support Operations Center

<b>ACRONYM</b>	<b>MEANING</b>
<b>ATC</b>	Air Traffic Control
<b>ATCAL</b>	Air Traffic Control and Landing
<b>ATM</b>	Air Tasking Message
<b>ATO</b>	Air Tasking Order
<b>ATOB</b>	Air Tasking Order Branch
<b>AUTODIN</b>	Automatic Digital Network
<b>AWAC</b>	Airborne Warning and Control
<b>BCE</b>	Battlefield Coordination Element
<b>C2</b>	Command and Control
<b>C3</b>	Command, Control and Communications
<b>C3CM</b>	Command, Control and Communications Countermeasures
<b>C3I</b>	Command, Control, Communications and Intelligence
<b>C3OB</b>	Command, Control and Communications Order-of-Battle
<b>C-CS</b>	Communications-Computer Systems
<b>CA</b>	Counter Air
<b>CAF</b>	Combat Air Forces
<b>CAFMS</b>	Computer Aided Force Management System
<b>CARDO</b>	Combat Air Rescue Operations Duty Officer
<b>CAS</b>	Close Air Support
<b>CBR</b>	Chemical, Biological and Radiological
<b>CC</b>	Control Capability
<b>CCI</b>	Chief of Combat Intelligence
<b>CCO</b>	Chief of Combat Operations
<b>CCP</b>	Chief of Combat Plans
<b>CCSD</b>	Communications Circuit System Designator
<b>CCT</b>	Combat Control Team
<b>CEDO</b>	Communications-Electronics Duty Officer
<b>CEDT</b>	Communications-Electronics Duty Technician
<b>CEMO</b>	Communications-Electronics Management Officer
<b>CHOP</b>	Change of Operational Control
<b>CID</b>	Combat Intelligence Division
<b>CME</b>	Collection Management Element
<b>COD</b>	Combat Operations Division
<b>COMAFFOR</b>	Commander, Air Force Forces
<b>COMCRF</b>	Commander of Combat Rescue Forces
<b>COMINT</b>	Communications Intelligence
<b>COMSEC</b>	Communications Security
<b>COMSPOT</b>	Communications Spot
<b>COMSTAT</b>	Communications Status
<b>CONUS</b>	Continental United States
<b>CPB</b>	Campaign Plans Branch
<b>CPD</b>	Combat Plans Division
<b>CRC</b>	Control and Reporting Center
<b>CSA</b>	Current Situation Analyst
<b>CSAR</b>	Combat Search and Rescue
<b>CSSC</b>	Combat Service Support Center

<b>ACRONYM</b>	<b>MEANING</b>
<b>CSSO</b>	Contingency Support Supply Office
<b>CST</b>	Current Situation Technician
<b>CT</b>	Control Technician
<b>CTAPS</b>	Contingency TACS Automated Planning System
<b>DARS</b>	Daily Aerial Reconnaissance and Surveillance
<b>DCA</b>	Defensive Counter Air
<b>DDO</b>	Defensive Duty Officer
<b>DEFCON</b>	Defense Condition
<b>DG</b>	Duty Group. A duty group is an organizational grouping of duty positions that perform a specific mission-related function. An example duty group would be "Combat Plans".
<b>DGZ</b>	Desired Ground Zero
<b>DIRMOBFOR</b>	Director of Mobility Forces
<b>DISUM</b>	Daily Intelligence Summary
<b>DMPI</b>	Desired Mean Point of Impact
<b>DMS</b>	Defense Message System
<b>DO</b>	Director of Operations
<b>DOB</b>	Defensive Operations Branch
<b>DOD</b>	Department of Defense
<b>DSNET</b>	Defense Secure Network
<b>DSU</b>	Direct Support Unit
<b>DT</b>	Duty Technician
<b>E&amp;E</b>	Evasion and Escape
<b>EC</b>	Electronic Combat
<b>ECCM</b>	Electronic Counter-Countermeasures
<b>ECDO</b>	Electronic Combat Duty Officer
<b>ECM</b>	Electronic Countermeasures
<b>ECTAR</b>	Electronic Countermeasures Tactical Action Report
<b>EEI</b>	Essential Elements of Information
<b>EMAIL</b>	Electronic Mail. Electronic mail is used to send and receive mail electronically.
<b>EOB</b>	Enemy Order-of-Battle
<b>ERAFSSO</b>	Emergency Reaction Air Force Special Security Office
<b>ESC</b>	Electronic Security Command
<b>ESM</b>	Electronic Support Measures
<b>ETA</b>	Estimated Time of Arrival
<b>ETRO</b>	Estimated Time to Return to Operational Status
<b>EW</b>	Electronic Warfare
<b>EXPLAN</b>	Exercise Plan
<b>FAC</b>	Forward Air Controller
<b>FACP</b>	Forward Air Control Post
<b>FDO</b>	Fighter Duty Officer
<b>FEBA</b>	Forward Edge of Battle Area
<b>FFA</b>	Free Fire Area
<b>FLEX</b>	Force Level Execution

<b>ACRONYM</b>	<b>MEANING</b>
<b>FLIP</b>	Flight Information Publications
<b>FLOT</b>	Forward Line of Own Troops
<b>FMC</b>	Fighter Mission Coordinator
<b>FOL</b>	Forward Operating Location
<b>FSCL</b>	Fire Support Control Line
<b>GEOREF</b>	Geographical Reference
<b>GLO</b>	Ground Liaison Officer
<b>HCI</b>	Human Computer Interface
<b>HF</b>	High Frequency
<b>HMI</b>	Human-Machine Interface
<b>HUMINT</b>	Human Intelligence
<b>IAW</b>	In Accordance With
<b>ICAO</b>	International Civil Aviation Organization
<b>ICM</b>	Intelligence Correlation Module
<b>ICO</b>	Interface Control Officer
<b>ICT</b>	Interface Control Technician
<b>ICU</b>	Interface Control Unit
<b>IFF/SIF</b>	Identification Friend or Foe/Selective Identification Feature
<b>IIR</b>	Imagery Interpretation Report
<b>IMINT</b>	Imagery Intelligence
<b>IMOM</b>	Improved Many On Many
<b>INFLTREP</b>	Inflight Report
<b>INTREP</b>	Intelligence Report
<b>INTSUM</b>	Intelligence Summary
<b>ISB</b>	Intelligence Support Branch
<b>ISM</b>	Intelligence Support Branch
<b>J-SAK</b>	Joint Attack of Second Echelon
<b>JAOC</b>	Joint Air Operations Center
<b>JCS</b>	Joint Chiefs of Staff
<b>JDSS</b>	JFAC Decision Support System
<b>JFACC</b>	Joint Force Air Component Commander
<b>JFC</b>	Joint Force Commander
<b>JI/EC</b>	Joint Interrogation/Exploitation Center
<b>JINTACCS</b>	Joint Interoperability of Tactical Command and Control System
<b>JMEM/AS</b>	Joint Munitions Effectiveness Manuals, Air-to-Surface
<b>Joint STARS</b>	Joint Surveillance Target Attack Radar System
<b>JOPEs</b>	Joint Operations Planning and Execution System
<b>JOTS</b>	Joint Operational Tactical System
<b>JP</b>	Joint Publication
<b>JRC</b>	Joint Rescue Coordination Center
<b>JSOTF</b>	Joint Special Operations Task Force
<b>JTF</b>	Joint Task Force
<b>JTIDS</b>	Joint Tactical Information Distribution System
<b>JUWTF</b>	Joint Unconventional Warfare Task Force

<b>ACRONYM</b>	<b>MEANING</b>
<b>KIA</b>	Killed in Action
<b>KILLREP</b>	Kill Report
<b>LCC</b>	Land Component Commander
<b>LENSCE</b>	Limited Enemy Situation Correlation Element
<b>LIM</b>	Limited
<b>LIMFAC</b>	Limiting Factor
<b>LOC</b>	Lines of Communication
<b>LOGSTAT</b>	Logistics Status
<b>LRC</b>	Logistics Readiness Center
<b>LRP</b>	Limited Response Package
<b>MCE</b>	Modular Control Equipment
<b>MIA</b>	Missing in Action
<b>MICAP</b>	Mission Capability
<b>MIJI</b>	Meaconing, Interference, Jamming, and Intrusion
<b>MISREP</b>	Mission Report
<b>MOB</b>	Main Operating Base; Missile Order-of-Battle
<b>MPC</b>	Message Processing Center
<b>MRR</b>	Minimum Risk Route
<b>MRSP</b>	Mobility Readiness Spares Package
<b>MT</b>	Megaton
<b>MTF</b>	Message Text Format
<b>MWR</b>	Morale, Welfare and Recreation
<b>NAF</b>	Numbered Air Force
<b>NALE</b>	Naval and Amphibious Liaison Element
<b>NATO</b>	North Atlantic Treaty Organization
<b>NAVAID</b>	Navigational Aid
<b>NCA</b>	National Command Authority
<b>NCMO</b>	Navigational Aids/Communications Management Officer
<b>NCOIC</b>	Non-Commissioned Officer in Charge
<b>NLT</b>	Not Later Than
<b>NSA</b>	National Security Agency
<b>NUDET</b>	Nuclear Detonation
<b>OCA</b>	Offensive Counter Air
<b>ODO</b>	Offensive Duty Officer
<b>OIB</b>	Operations Intelligence Branch
<b>OOB</b>	Offensive Operations Branch
<b>OP</b>	Operational
<b>OP/LIM</b>	Operational Limitation
<b>OPCON</b>	Operational Control
<b>OPLAN</b>	Operations Plan
<b>OPORD</b>	Operations Order
<b>OPSEC</b>	Operational Security
<b>PACAF</b>	Pacific Air Command Air Forces

<b>ACRONYM</b>	<b>MEANING</b>
<b>PERSCO</b>	Personal Support for Contingency Operations
<b>PIB</b>	Plans Intelligence Branch
<b>POL</b>	Petroleum, Oil and Lubricants
<b>PSYOPS</b>	Psychological Operations
<b>PSYWAR</b>	Psychological Warfare
<b>PW</b>	Prisoner of War
<b>QRP</b>	Quick Response Package
<b>RCC</b>	Rescue Coordination Center
<b>RDO</b>	Reconnaissance Duty Officer
<b>RECCEXREP</b>	Reconnaissance Exploitation Report
<b>REM</b>	Route Evaluation Module
<b>RESCAP</b>	Rescue Combat Air Patrol
<b>RFO</b>	Reason for Outage
<b>RI</b>	Request for Information
<b>RII</b>	Request for Intelligence Information
<b>ROE</b>	Rules of Engagement
<b>RP</b>	Restoration Priority
<b>RWR</b>	Radar Warning Receiver
<b>SADO</b>	Senior Air Defense Officer
<b>SAM</b>	Surface-to-Air Missile
<b>SAR</b>	Search and Rescue
<b>SCI</b>	Special Compartmented Information
<b>SEAD</b>	Suppression of Enemy Air Defenses
<b>SIDL</b>	Standard Intelligence Document List
<b>SIGINT</b>	Signal Intelligence
<b>SITREP</b>	Situation Report
<b>SMDO</b>	Special Mission Duty Officer
<b>SMA</b>	System Message Alert
<b>SMO</b>	Systems Management Officer
<b>SOCOM</b>	Special Operations Command
<b>SODO</b>	Senior Operations Duty Officer
<b>SODT</b>	Senior Operations Duty Technician
<b>SOF</b>	Special Operations Forces
<b>SOTA</b>	SIGINT Operational Tasking Authority
<b>SPIREP</b>	Special Report
<b>SRI</b>	Special Request for Information
<b>SSC</b>	Standard System Center
<b>SUPIR</b>	Supplemental Photo Interpretation Report
<b>SUM</b>	Software User's Manual
<b>SYSADS</b>	Systems Administration Branch
<b>SYSCON</b>	Systems Control Center
<b>TAC-A</b>	Tactical Air Coordinator - Airborne
<b>TACS/TADS</b>	Tactical Air Control System/Tactical Data System
<b>TACP</b>	Tactical Air Control Party

<b>ACRONYM</b>	<b>MEANING</b>
<b>TACREP</b>	Tactical Report
<b>TACS</b>	Theater Air Control System
<b>TADIL</b>	Tactical Digital Information Link
<b>TALCE</b>	Tanker/Airlift Control Element
<b>TALO</b>	Theater Airlift Liaison Officer
<b>TBM</b>	Theater Battle Management
<b>TMCP</b>	Theater Munitions Control Point
<b>TOT</b>	Time Over Target
<b>TPFDD</b>	Time-Phased Force Deployment Data
<b>TRP</b>	Theater Response Package
<b>USAF</b>	US Air Force
<b>USAFE</b>	US Air Forces in Europe
<b>USMC</b>	US Marine Corps
<b>USN</b>	US Navy
<b>UOC</b>	Unit Operations Center
<b>UTM</b>	Universal Transverse Mercator
<b>UW</b>	Unconventional Warfare
<b>UWOA</b>	Unconventional Warfare Operational Area
<b>WAO</b>	Weapons Assignment Officer
<b>WIA</b>	Wounded in Action
<b>WOC</b>	Wing Operations Center
<b>WRM</b>	War Reserve Materiel
<b>WSB</b>	Weather Support Branch
<b>WWMCCS</b>	Worldwide Military Command and Control System

## APPENDIX C

### GLOSSARY

<b>TERM</b>	<b>DEFINITION</b>
<b>Acceleration</b>	A temporary change in the mouse pointer gain.
<b>Accelerator</b>	A key or sequence of keys (typically a modifier key and some other key) that provides a shortcut. Immediately accessing a program function.
<b>Activation</b>	Invocation of a component (s) primary action. For example, the user activates a PushButton by pressing BSelect (the S button) on the PushButton.
<b>Anchor</b>	A position in a collection of selectable objects that marks one endpoint of an extended selection range.
<b>Application Modal</b>	A state of a window in which interaction is limited window and windows outside of that window's application
<b>Cascading Menu</b>	A submenu that provides selections that amplify the selection on a Pull Down or Pop-up Menu.
<b>Checkbutton</b>	A component used to select settings that are not exclusive. The visual cue to the selection is frequently that the button is filled in or checked.
<b>Click</b>	To press and release a mouse button. The term comes from the fact that pressing and releasing most mouse buttons makes a clicking sound.
<b>Client Area</b>	The area within the borders of a primary window (s) frame that is controlled by an application.
<b>Clipboard</b>	Any device used to store text or graphics during cut-and-paste operations.
<b>Control Panel</b>	An area of a window, similar to the control panels in real life, that is used to hold PushButtons and other graphical components.
<b>Dialogbox</b>	A secondary window that the user can display and that contains application components.
<b>Dimmed Selection</b>	A selection that is not currently available.

<b>TERM</b>	<b>DEFINITION</b>
<b>Discontiguous Selection</b>	A selection model that allows multiple discontiguous selections.
<b>Double-Click</b>	To press and release a mouse button twice in rapid succession.
<b>Drag And Drop</b>	A transfer mechanism where data is dragged from as drop site using mouse motion.
<b>Drag Icon</b>	A graphic that is generated using pixmaps and is moved during a drag operation. The drag icon is composed of a source pixmap, a state cursor, and an operation cursor.
<b>Drag Transfer</b>	See drag and drop.
<b>Explicit Focus</b>	A keyboard focus model that sends keyboard event window or component that was specified explicitly mouse button or a keyboard event.
<b>Focus policy</b>	The model by which keyboard focus is moved among components. See also explicit focus, implicit focus.
<b>Grayed Selection</b>	A Menu selection that is not currently available and so has been dimmed.
<b>Highlight</b>	A graphic technique used to provide a visual cue to the current selection or to the current location of the input focus. Highlighting is frequently accomplished by reversing the video of the selection.
<b>Hotspot</b>	The area of a graphical image used as a pointer or cursor that is defined as the point of the pointer or cursor
<b>I-Beam</b>	A graphical image used to represent the location of the mouse pointer in a text entry box and providing a visual cue that text can be entered in an area.
<b>Insertion Cursor</b>	The graphical symbol that provides the visual cue to location of the insertion point.
<b>Icon Box</b>	A window for organizing icons.
<b>Implicit Focus</b>	A keyboard focus model that sends keyboard events to the window or component that the mouse pointer is over.

<b>TERM</b>	<b>DEFINITION</b>
<b>Keyboard Focus</b>	Indicates the window or component within a window that receives keyboard input. It is sometimes called the input focus.
<b>List Box</b>	A component that provides users with a scrollable list of options from which to choose.
<b>Location Cursor</b>	A graphical symbol that marks the current location of the keyboard input focus for selection. Typically, this symbol is a box that surrounds the current object.
<b>Mnemonic</b>	A single character (frequently the initial character) of a Menu selection. When the Menu is displayed and the user presses the key that corresponds to that character, the Menu selection is chosen.
<b>Modifier Key</b>	A key that, when pressed with another key, changes the meaning of the other key. <Ctrl>, <Alt>, and <Shift> are modifier keys.
<b>Pointing Device</b>	A device such as a mouse, trackball, or graphics tablet that allows users to move a pointer about on the workspace and point to graphical objects.
<b>Pop-up Menu</b>	A Menu that provides no visual cue to its presence, but simply pops up when a user performs a particular action. Pop-up Menus are associated with a particular area of the workspace, such as the client area of an application, and a user must memorize where these actions are. It is not recommended that a pop-up menu be the only method of accessing a particular function.
<b>Posted</b>	A state of a Menu where it remains in a visible state even though a mouse button is not being held down. See also spring-loaded.
<b>Primary Modal</b>	A state of a window in which interaction is limited to that window and windows that are not ancestors of that window.
<b>Primary Transfer</b>	A transfer mechanism where the primary selection is transferred to the destination.
<b>Primary Window</b>	A top-level window of an application. Primary windows can be minimized.
<b>Quick Transfer</b>	A transfer mechanism where selected data is immediately transferred to the destination.

<b>TERM</b>	<b>DEFINITION</b>
<b>Range Selection</b>	A selection model that allows selection of a range of elements.
<b>Slider</b>	One of the graphical components of a ScrollBar or Scale. The slider is the object that is dragged along the scroll area to cause a change.
<b>Spring-Loaded</b>	A state of a Menu where it remains only as long as a mouse button is being held down. See also posted.
<b>System Modal</b>	A state of a window in which interaction is limited to that window.
<b>Tab Group</b>	A tab group is a group of widgets that are related for the purpose of keyboard traversal. For example, all the items in a menu are considered a tab group, since they are grouped together to perform related functions.
<b>Transient Window</b>	A window of short duration such as a DialogBox. The window is displayed for only a short time, usually just long enough to convey some information or get some operational directions.
<b>Transversal</b>	A navigational action that causes the focus to move to another component.
<b>Window Family</b>	A window family consists of a single primary window and all of its associated secondary windows.

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