

DOD INTERACTIVE ELECTRONIC TECHNICAL MANUALS (IETMs)

**Using the Interactive Electronic Technical Manual (IETM)
Specifications Developed by the Tri-Service Working
Group for IETMs**

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PRESENTATION

- **Current IETM Specifications - Releases and Status**
- **Role of the Specifications in Creating IETMs**
- **Implementation Issues in an IETM Environment**

David Taylor Model Basin Headquarters, Carderock Division, NSWC

- **Formerly David Taylor Research Center**
- **Navy Facility Located in Bethesda, Maryland**
- **Navy Lead Laboratory for CALS Technology R&D**
- **Navy Lead Laboratory for Technical Manual Automation**
- **Chairman of Tri-Service Working Group for IETMs**

TRI-SERVICE WORKING GROUP FOR IETMs

- **Chartered in August 1989 by OSD**
- **Initial Task - Develop IETM Specifications, handbooks, and tutorials**
- **Additional Role - Advisor to Defense CALS Executive on IETM matters**
- **Chaired by Navy**
- **Members: Army (MRSA), Navy (CD/NSWC), Air Force (AFMC/ENC)**

What are IETMs?

- **Functional Equivalent of Paper Technical Manuals**
- **Viewed on an Electronic Display**
- **Formatted for Screen, not Page**
- **Interactive with the User**
- **Implement Data Base Philosophy of CALS**
- **Provide End-User System for CALS Data**

Payoff of IETMs

- **Demonstrated Faster and More Accurate Maintenance**
- **Better Performance from Less Experienced Technicians**
- **Reduced TM Weight and Storage Allocation on Ships**
- **Eliminate Fleet Time to Maintain Paper TM Changes**
- **Technicians Want Them - Motivated to Use Effectively**

CURRENT DOD SPECIFICATION SUITE

Interactive Electronic Technical Manuals (IETMs)

FINAL SPECIFICATIONS WERE ISSUED ON 20 NOV 1992:

- **GENERAL IETM CONTENT, STYLE, FORMAT, AND USER-INTERACTION REQUIREMENTS (MIL-M-87268)**
- **IETM REVISABLE DATA BASE REQUIREMENTS (MIL-D-87269)**
- **IETM QUALITY ASSURANCE PROGRAM (MIL-Q-87270)**

MILESTONES LEADING UP TO RELEASE

First Unrestricted Distribution - Jun 90

Technical Comments by Gov't and Industry - Aug-Oct 90

Revised Specs Delivered to DoD for Coordination - Apr 91

CALS Policy Office Request for Comments - Apr 91

Services Release for Official Comment - May-Jul 91

CALS Standards Committee Release for Comment - Jul 91

CALS Industry Coordination Meeting - Sep 91

Official Service Comments Received - Mar 92

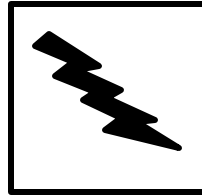
Documents Coordinated and Revised - Jul 92;

Final Service Approval Sep 92, Formal Release Nov 92

GENERAL CONTENT, STYLE, FORMAT, AND USER-INTERACTION SPECIFICATION (MIL-M-87268)

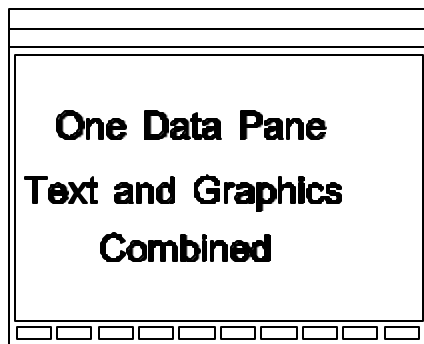
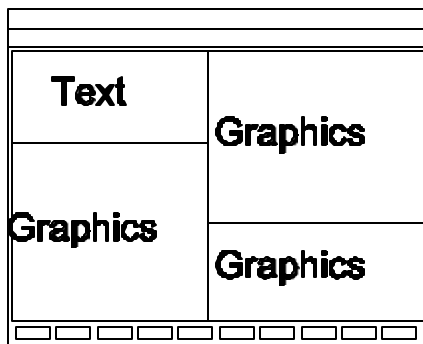
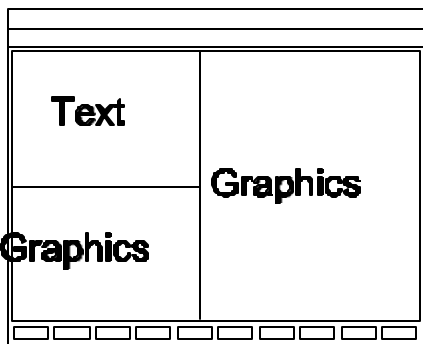
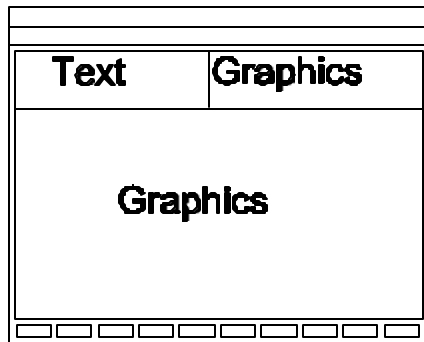
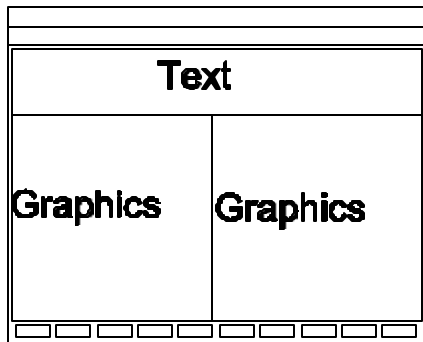
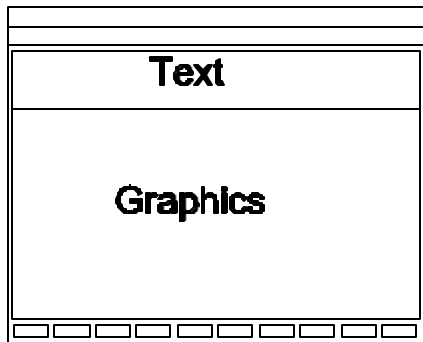
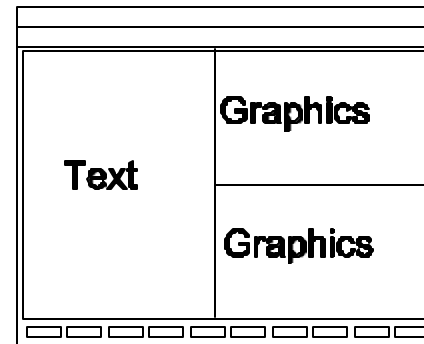
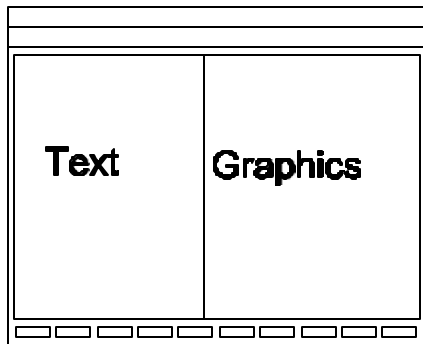
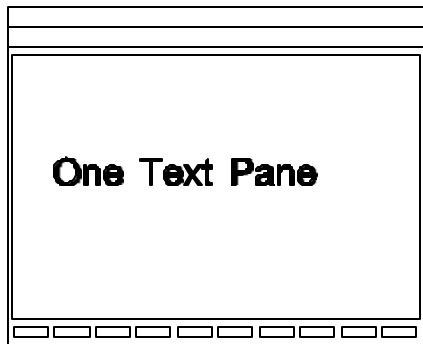
- **General Content and Style Requirements for:**
 - Administrative Information**
 - Text**
 - Graphics**
 - Prompts**
 - Warnings, Cautions, and Notes**
 - Display Formats (Frame Templates)**

WARNING



**Removal of cover without
disconnecting power cord
may result in severe
electric shock.**

Format for Warning

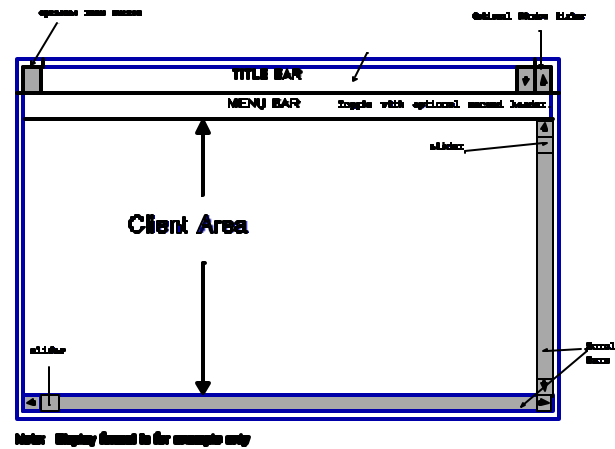


Allowable Templates for Presenting Text and Graphics

STANDARD GRAPHICS USER-INTERFACE

- **Determines Most User-Interaction Features**
- **Implementable in Commercial Packages**
MOTIF, OPEN LOOK, WINDOWS
- **Standardized Interaction-Function Dictionary**
(Can be Hard or Soft Keys, Select Buttons)
- **Custom Features Restricted to Client Area**
- **Common "Look-and-Feel" among DOD IETMs**

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Graphic User Interface - Window Controls

TITLE (Options)

Select from the following:

Option 1

Option 2

Option 3

OK CANCEL

Multiple-Choice Dialog

Any message here to alert the user .

OK

Alert Dialog

Push Button

USER RESPONSE:

ENTER TECHNICIAN ID

MULTIPLE CHOICE:

Option 1

Option 2

Option 3

OPTION ?:

YES

NO

MAYBE

OK CANCEL

Multiple Choice Buttons

Data Entry Field

Radio Buttons

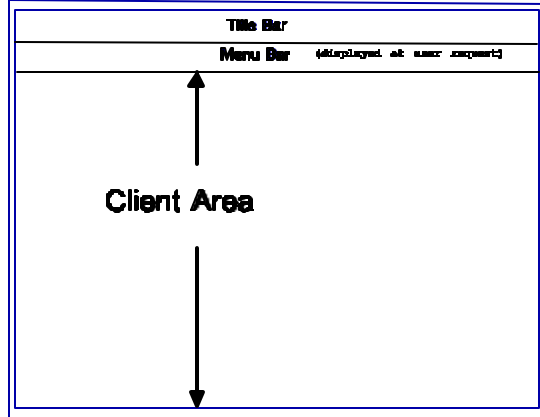
A combination of dialogs can be used in a single dialog box.

Specific format for example only.

Graphic User Interface - Interaction Features

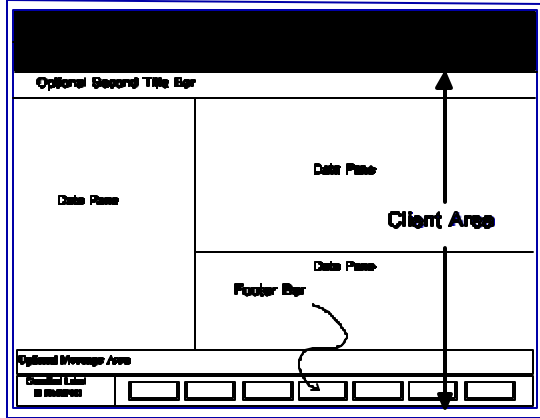
STANDARD DISPLAY TEMPLATE

- **TM Information Displayed in Window Panes**
- **Client area of Standard User Interface**
- **Header Bar**
- **Menu Bar**
- **Optional Message Bar**
- **Footer Bar with TM Selection Functions**
- **Coordinated Text and Graphic Windows**



Note: Only used in the example only

IETM Functionality Requirements Apply to Client Area



Note: Display based on the example only

Sample Layout for IETM Frame

REVISABLE IETM DATA BASE: MIL-D-87269

- **Describes Basic Data Structure**

Networked Nodes with Links, Attributes, Prompts

Option for "Smart" Nodes (IF-NODES, FOR-NODES)

SGML Generic-Level Architectural Framework

HYTIME for Internal and External References

- **Content-Specific DTDs are based on Generic Level**

Standard Data-Element Description and Names

Specific Attributes Specified for Each Data-Entity

Specifies Basic Linkages (Relationships) of Entities

IETM Data DTDs and Tags for Interchange

- **SGML Document Type Definitions (DTDs) are contained in the Data Base Specification**
- **Can be used to specify an interchange (ASCII "flat-file") version of the Data Base**
- **Includes the Tag Set needed to identify the Data Base elements and attributes**
- **Can be translated back into a data-base Structure for additional processing (i.e. View Packaging)**
- **Standard Content-Specific DTDs allow standard Presentation-System-Neutral File format**

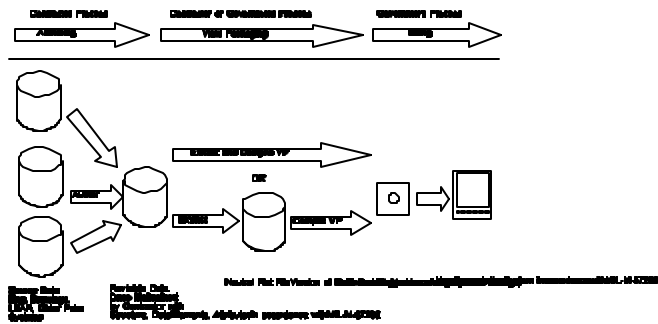
Steps in IETM Creation and Use Process

IETM Developer Authors IETM DATA BASE

DATA BASE can be SGML Tagged in Neutral Form

VIEW PACKAGES are extracted from the DATA BASE and compiled for Distribution to the User.

VIEW PACKAGES are then viewed Interactively on an ELECTRONIC DISPLAY SYSTEM (EDS)



The IETM Preparation and Use Cycle

QUALITY ASSURANCE PROGRAM

MIL-Q-87270

- **QA Plan Prepared by Contractor**
- **Approved and Made Part of Contract**
- **Covers Data Base Generation to End Product**
- **Validation on User Delivery Device**
- **Sets up QA Organization outside of IETM Authors**
- **Emphasis on Process of Creating IETM**

Role of Specifications in Processes

IETM DATA BASE is Structured and Data Elements named and/or tagged according to MIL-D-87269

DATA BASE ENTITIES are developed according to Content and Style Requirements of MIL-M-87268

IETM EDS Presentation Software is developed according to Formatting and User Interaction Requirements of MIL-M-87268

Entire Development Process is conducted according to the Requirements of MIL-Q-87270

Role of Specifications in Processes (Con'd)

Specifications for VIEW PACKAGES, the associated VP PREPARATION PROCEDURES and the ELECTRONIC DISPLAY SYSTEM Hardware must be separately negotiated for each procurement.

Specifications for these items are provided separately by the procuring activity as no Tri-Service Specifications have been developed at this time.

Key Issues in an IETM Environment

- **Authoring Systems**
- **Information Objects**
- **Opportunities for Additional Standards**
- **Next Generation Issues**

Authoring Systems

- **Authoring systems used to produce IETM Data Bases, not run-time files for presentation system.**
- **DoD will not specify authoring system, it will specify the data base product authored.**
- **Requires a rethink of the basic building blocks of authored data. Move away from paragraphs, sections, and chapters and move to an Information Object as the basic building block for content.**

Information Objects

- **Information Object contains the data for one "thought" to be presented, typically, in a single frame (e.g., a small block of text, graphic associated with that text, associated warnings, cross references to additional information, preconditions to determine if thought should be presented).**
- **It also contains all the data as to what interaction is available in the frame to respond to that thought (e.g., Displayable prompt, menu of possible responses, next node associated with each menu option).**

Opportunities for Additional Standards

- **Indexing across multiple View Packages**
- **Optical Media Standards for Distribution Media**
- **More detailed Style Guides needed to achieve Common "Look and Feel"**
- **Usability of IETM Specifications with emerging PDES/STEP Technical Publications Standards, AECMA 1000D, and ATA 2100**

Next Generation Issues

- **Multi-media (initially sound, continuous-tone pictures, and animation)**
- **Moving to Interactive TV and HDTV**
- **Illustrations from 3-D models.**
- **Training and diagnostics will get top billing**
- **Real-time (Just-in-Time) training**
- **Virtual Reality Training Concepts**
- **New Input/Output Mechanisms (Virtual Images, Voice Recognition, Eye Trackers)**