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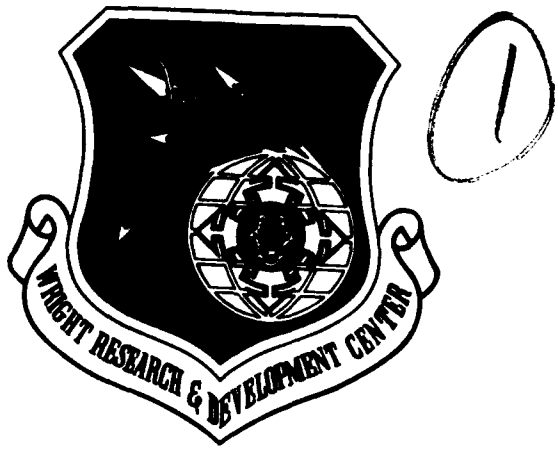

INTEGRATED INFORMATION SUPPORT SYSTEM (IISS)
Volume VIII - User Interface Subsystem
Part 45 - Electronic Documentation System (EDS) MacPaint to Postscript Unit Test Plan

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This unit test plan establishes the methodology and procedure to be used to test the capabilities of the Electronic Documentation System (EDS) MacPaint to Postscript computer program.

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FOREWORD

This technical report covers work performed under Air Force Contract F33600-87-C-0464, DAPro Project. This contract is sponsored by the Manufacturing Technology Directorate, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. It was administered under the technical direction of Mr. Bruce A. Rasmussen, Branch Chief, Integration Technology Division, Manufacturing Technology Directorate, through Mr. David L. Judson, Project Manager. The Prime Contractor was Integration Technology Services, Software Programs Division, of the Control Data Corporation, Dayton, Ohio, under the direction of Mr. W. A. Osborne. The DAPro Project Manager for Control Data Corporation was Mr. Jimmy P. Maxwell.

The DAPro project was created to continue the development, test, and demonstration of the Integrated Information Support System (IISS). The IISS technology work comprises enhancements to IISS software and the establishment and operation of IISS test bed hardware and communications for developers and users.

The following list names the Control Data Corporation subcontractors and their contributing activities:

SUBCONTRACTOR	ROLE
Control Data Corporation	Responsible for the overall Common Data Model design development and implementation, IISS integration and test, and technology transfer of IISS.
D. Appleton Company	Responsible for providing software information services for the Common Data Model and IDEF1X integration methodology.
ONTEK	Responsible for defining and testing a representative integrated system base in Artificial Intelligence techniques to establish fitness for use.
Simpact Corporation	Responsible for Communication development.
Structural Dynamics Research Corporation	Responsible for User Interfaces, Virtual Terminal Interface,and Network Transaction Manager design, development, implementation, and support.
Arizona State University	Responsible for test bed operations and support.

TABLE OF CONTENTS

Figures

SECTION 1

GENERAL

1.1 Purpose

This Unit Test Plan (UTP) establishes the methodology and procedures used to adequately test the capabilities of the computer program identified as the MACPAINT to EPSF (MPEPSF) translator. The MPEPSF translator is one configuration item of the Integrated Information Support System (IISS) Electronic Documentation System (EDS).

1.2 Project References

[1] Systran, ICAM Documentation Standards , IDS150120000C, 5 September 1983.

[2] International Organization for Standardization, Information Processing - Text and Office Systems - Standard Generalized Markup Language (SGML) , ISO 8879, 15 October 1986.

[3] International Organization for Standardization, Office Document Architecture/Office Document Interchange Format , ISO/DP 8613/1-6, October 1985 (Draft).

[4] American National Standards Institute, American National Standard for Information Systems - Computer Graphics - Metafile for the Storage and Transfer of Picture Description Information , ANSI X/3.122-1986, August 27, 1986.

[5] Structural Dynamics Research Corporation, Form Processor User's Manual , UM 620244200A, 16 February 1987.

[6] Structural Dynamics Research Corporation, Virtual Terminal Operator Guide , OM 620244000A, 16 February 1987.

[7] M.E. Lesk, LEX - Lexical Analyzer Generator, IS Workbench

for VAX/VMS Programmers Guide .

[8] Structural Dynamics Research Corporation, Form Processor Development Specification , DS 620244700A, 16 February 1987

[9] Apple Computer, Incorporated, MacIntosh Plus Owners Guide

[10] Apple Computer, Incorporated, MacIntosh MacPaint Users Manual

1.3 Terms and Abbreviations

American Standard Code for Information Interchange (ASCII) : The character set defined by ANSI X3.4 and used by most computer vendors.

Attribute : A characteristic used to qualify an element within a document.

Character Set : A mapping of a character repertoire onto a code set such that each character is associated with its coded representation.

Compound Document : A document which may contain mixed content (text, graphics, etc.).

Computer Graphics Metafile (CGM) : A standard file format for the storage and retrieval of picture description information.

Computer Program Configuration Item (CPCI) : An aggregation of computer programs or any of their discrete portions, which satisfies an end-use function.

Conforming SGML Application : An SGML application that requires documents to be conforming SGML documents, and whose documentation meets the requirements of this International Standard.

Context-Directed Editor : An EDS application which guides

the user through the process of document creation and revision by using the document type definition as a model for which logical elements may be included in the document.

Descriptive Markup : Information added to a document that enables an application program to process the document.

Document Type Definition (DTD) : Rules determined by an application that apply SGML to the markup of documents of a particular type. A document type definition includes a formal specification, expressed in a document type declaration, of the element types, element relationships and attributes, and references that can be represented by markup. It thereby defines the vocabulary of the markup for which SGML defines the syntax. A DTD can also include comments that describe the semantics of elements and attributes, and any application conventions.

Electronic Documentation System (EDS) : An integrated set of software tools and application programs which operate upon a document through various stages of a document life cycle consisting of editing (creating/revising), formatting, imaging, storage, and transfering.

Element : A component of the hierarchical structure defined by a document type definition; it is identified in a document instance by descriptive markup, usually a start-tag and end-tag.

Element Declaration : A markup declaration that contains the formal specification of the part of an element type definition that deals with the content and markup minimization.

Entity : A collection of characters that can be referenced as a unit.

Entity Declaration : A markup declaration that assigns an SGML name to an entity so that it can be referenced.

Entity Reference : A reference that is replaced by an entity.

Field : Two-dimensional space on a terminal screen.

Form : A structured view which may be imposed on windows or other forms. A form is composed of fields. These fields may be defined as forms, items, or windows.

Form Definition (FD) : Form definition Language after compilation. It is read at run-time by the Form Processor.

Form Definition Language (FDL) : The language in which electronic forms are defined.

Form Editor (FE) : A subset of the IISS User Interface that is used to create definitions of forms. The FE consists of the Forms Driven Form Editor and the Forms Language Compiler.

Form Hierarchy : A graphic representation of the way in which forms, items, and windows are related to their parent form.

Form Language Compiler (FLAN) : A subset of the FE that consists of a batch process that accepts a series of form definition language statements and produces form definition files as output.

Form Processor (FP) : A subset of the IISS User Interface that consists of a set of callable execution-time routines available to an application program for form processing.

Forms Driven Form Editor (FDFE) : A subset of the FE which consists of a forms-driven application used to create Form Definition files interactively.

Generic Identifier : A name that identifies the element type of an element.

IISS Function Screen : The first screen that is displayed after logon. It allows the user to specify the function to access and the device type and device name on which to work.

Integrated Information Support System (IISS) : A test computing environment used to investigate, demonstrate, and test the concepts of information management and information integration in the context of Aerospace Manufacturing. The IISS addresses the problems of integration of data resident on heterogeneous data bases supported by heterogeneous computers interconnected via a Local Area Network.

Item : A non-decomposable area of a form in which hard-coded descriptive text may be placed and the only defined areas where user data may be input/output.

Layout Style : The specification of format and presentation for logical elements.

Layout Structure : The hierarchy of all layout elements (pages, frames, blocks, etc.) for a document.

Logical Structure : The hierarchy of all logical elements (paragraphs, sections, etc.) within a document.

Markup : Text that is added to the data of a document in order to convey information about it.

Markup Minimization : A feature of SGML that allows markup to be minimized by shortening or omitting tags, or shortening entity references.

Message : Descriptive text which may be returned in the standard message line on the terminal screen. Messages are used to warn of errors or provide other user information.

Message Line : A line on the terminal screen that is used to display messages.

Operating System (OS) : Software supplied with a computer which allows it to supervize its own operations and manage access to hardware facilities such as memory and peripherals.

Page : Instance of forms in windows that are created whenever a form is added to a window.

Paging and Scrolling : A method which allows a form to contain more data than can be displayed at one time with provisions for viewing any portion of the data buffer.

Parser : An application program that determines how closely a document conforms to a document type definition which defines a specific documentation standard.

Physical Device : A hardware terminal.

Previous Cursor Position : The position of the cursor when the previous edit command was issued.

Qualified Name : The name of a form, item, or window preceded by the hierarchy path so that it is uniquely identified.

Standard Generalized Markup Language (SGML) : A language for describing document structures, consisting of descriptive markup which is added to a document to indicate where logical elements such as sections and paragraphs begin and end.

Subform : A form that is used within another form.

Tag : Descriptive markup indicating the start or end of a logical element.

Tagger : An application program which provides a mechanism for automatically tagging existing documents which have been created by word processing systems.

User Interface (UI) : IISS subsystem that controls the user's terminal and interfaces with the rest of the system. The UI consists of two major subsystems: The User Interface Development System (UIDS) and the User Interface Management System (UIMS).

User Interface Management System (UIMS) : The run-time UI. It consists of the Form Processor, Virtual Terminal, Application Interface, the User Interface Services, and the Text Editor.

User Interface Services (UIS) : A subset of the IISS User Interface that consists of a package of routines that aid users in controlling their environment. It includes message management, change password, and application definition services.

User Interface/Virtual Terminal Interface (UI/VTI) : Another name for the User Interface.

Virtual Terminal (VT) : A subset of the IISS User Interface that performs the interfacing between different terminals and the UI. This is done by defining a specific set of terminal features and protocols which must be supported by the UI software which constitutes the virtual terminal definition. Specific terminals are then mapped against the virtual terminal software by specific software modules written for each type of real terminal supported.

Virtual Terminal Interface (VTI) : The callable interface to the VT.

Window : Dynamic area of a terminal screen on which predefined forms may be placed at run-time.

Window Manager : A facility which allows the following to be manipulated: size and location of windows, the device on which an application is running, the position of a form within a window. It is part of the Form Processor.

SECTION 2

DEVELOPMENT ACTIVITY

2.1 Statement of PreTest Activity

During system development, the computer programs were tested progressively. Functionality was incrementally tested, and as bugs were discovered by this testing, the software was corrected.

All pretest activity was conducted by the individual developer in a manual mode. The developer would create MacPaint documents on the MacIntosh, convert them to EPSF using the MPEPSF application program, transfer the EPSF to the VAX, and then print them to make sure the EPSF image matched the MacPaint document. Any errors were then noted by the developer, and corrections were then made to the MPEPSF translator.

2.2 PreTest Activity Results

The results of the pretest activity were that all coding errors were discovered prior to the release date. By using MacPaint images as figures in other EDS Unit Test Plans, the MPEPSF translator was thoroughly tested.

SECTION 3

SYSTEM DESCRIPTION

3.1 System Description

The MacPaint to Postscript translator enables a user to convert MacIntosh MacPaint files residing on the MacIntosh to encapsulated Postscript files (EPSF). EPSF files are Ascii text files containing Postscript language statements that describe the converted MacPaint document. EPSF files can be transferred to the VAX and included in EDS documents using external file references that are processed by the EDS Document Formatter.

The contents and format of EPSF files are based on the EPSF structuring conventions document, available from Adobe Systems or SDRC.

3.2 Testing Schedule

Since the MPEPSF application program must be executed on an Apple MacIntosh personal computer, the execution of the Unit Test plan for MPEPSF is not dependent upon any other components of either EDS or IISS.

3.3 First Location Testing

These tests of the MPEPSF translator require the following:

Equipment: MacIntosh computer, Air Force VAX, output device capa accepting Postscript.

Support Software: MacIntosh MacPaint program.

Personnel: one integrator familiar with EDS, the MacIntosh, and MacPaint.

Training: the EDS User Manual has been previously delivered

Deliverables: the MPEPSF translator CPCI

Test Materials: none

Security Considerations: None.

3.4 Subsequent Location Testing

The requirements listed above must be met.

SECTION 4

SPECIFICATIONS AND EVALUATIONS

4.1 Test Specification

The Unit Test Plan is based on covering specific functionality of the MPEPSF translator outlined in the EDS Development Specification (DS).

The objective of the MPEPSF Unit Test Plan is to insure that a MacPaint document can be created, converted to EPSF by the MPEPSF translator, and then be sucessfully reproduced on a VAX by a Postscript compatible output device.

4.2 Testing Methods and Constraints

To test the MPEPSF translator, the user must use MacPaint to create a test MacPaint document. This document is then converted to Postscript EPSF using the MPEPSF translator. The EPSF document must then be sent to the VAX using any available file transfer capability (i.e. Kermit). Once the file is on the VAX, it must be sent to a Postscript printer. The resultant document should exactly match the document that was created on the MacIntosh using MacPaint.

No additional constraints are placed on this unit test besides those listed in Sections 5.2 and 3.3 of this document.

4.3 Test Progression

The MPEPSF Unit Test Plan consists of only one test.

4.4 Test Evaluation

The test results are evaluated by comparing the output of the VAX Postscript printer to the document created on the MacInstosh using MacPaint.

SECTION 5

TEST PROCEDURES

5.1 Test Description

A general description of this unit test was provided in Section 4.2.

5.2 Test Control

As outlined above, this unit test must be run on an Apple MacInstosh Computer and must be executed manually. The test is control information is completely described by the creation of a MacPaint document using the MacPaint application program and the conversion of this MacPaint document to Postscript EPSF by the MPEPSF application program. The sequence of actions needed to run this Unit Test Plan are given in Section 5.3.

The MPEPSF application program is contained on a 3-1/2 inch floppy diskette and can be obtained from IISS Configuration Management. The application program can be executed directly from the floppy disk.

5.3 Test Procedures

To run the Unit Test Plan one must be running on an Apple MacIntosh computer. The user should then execute the MacPaint application by double clicking the MacPaint Icon. The user should then proceed to create a test image using MacPaint. The user may wish to create the same test image as shown in Figure 5-1 or they may create a test image of their own.

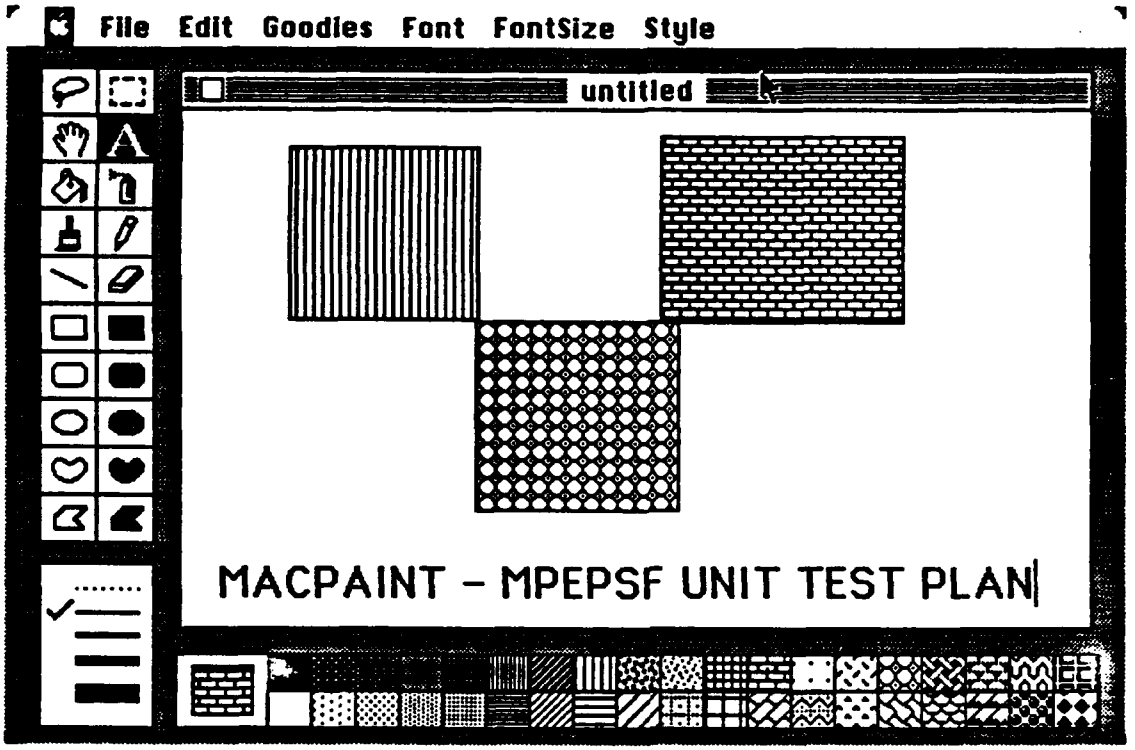

Figure 5-1 Creating the MacPaint Test Image

Once a MacPaint document has been created, it should be saved by opening the FILES Menu and selecting the SAVE AS menu item. The following figure will appear and the name of the desired output file can be typed into the output file name box.

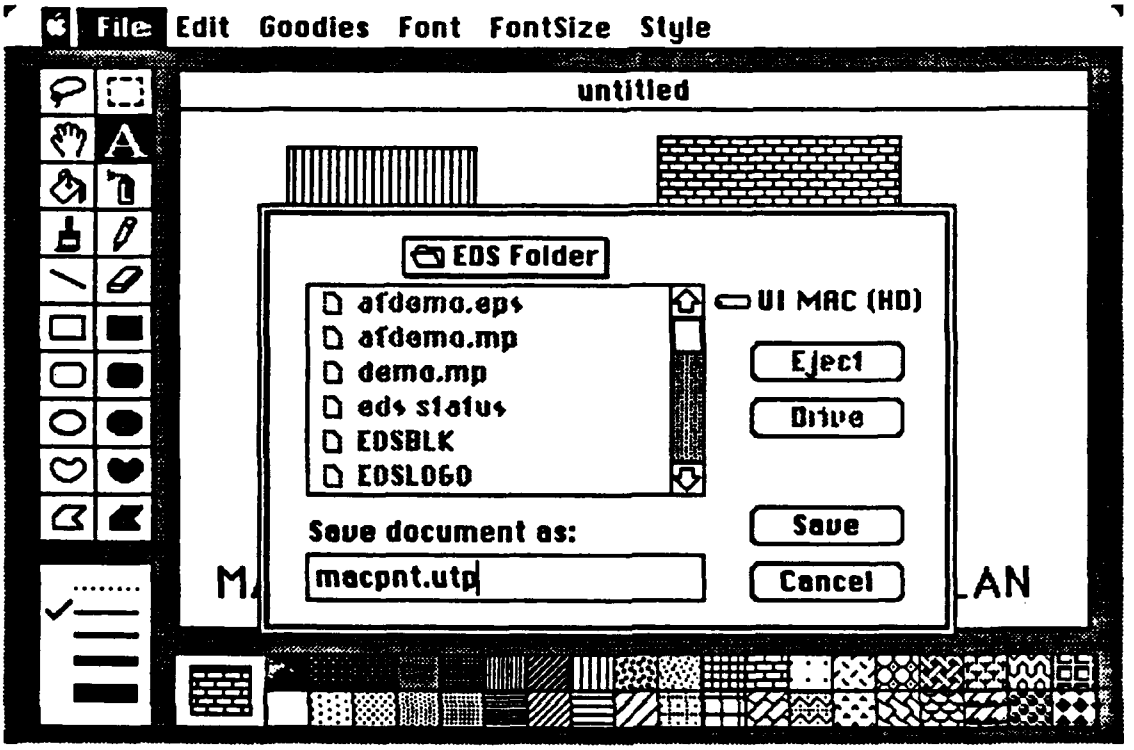

Figure 5-2 Saving the MacPaint Test Image

Once the MacPaint document has been saved, open the FILES Menu once again and choose the QUIT item to exit the MacPaint application program.

Thee MPEPSF application program should now be executed bu double clicking the MPEPSF Icon with the mouse. The MacPaint document can then be viewed by selecting the OPEN menu item from the FILES menu. The tester should then select the name of the previously created MacPaint file when the list of MacPaint files is displayed by the MPEPSF application. The following figure illustrates the selection of a MacPaint file.

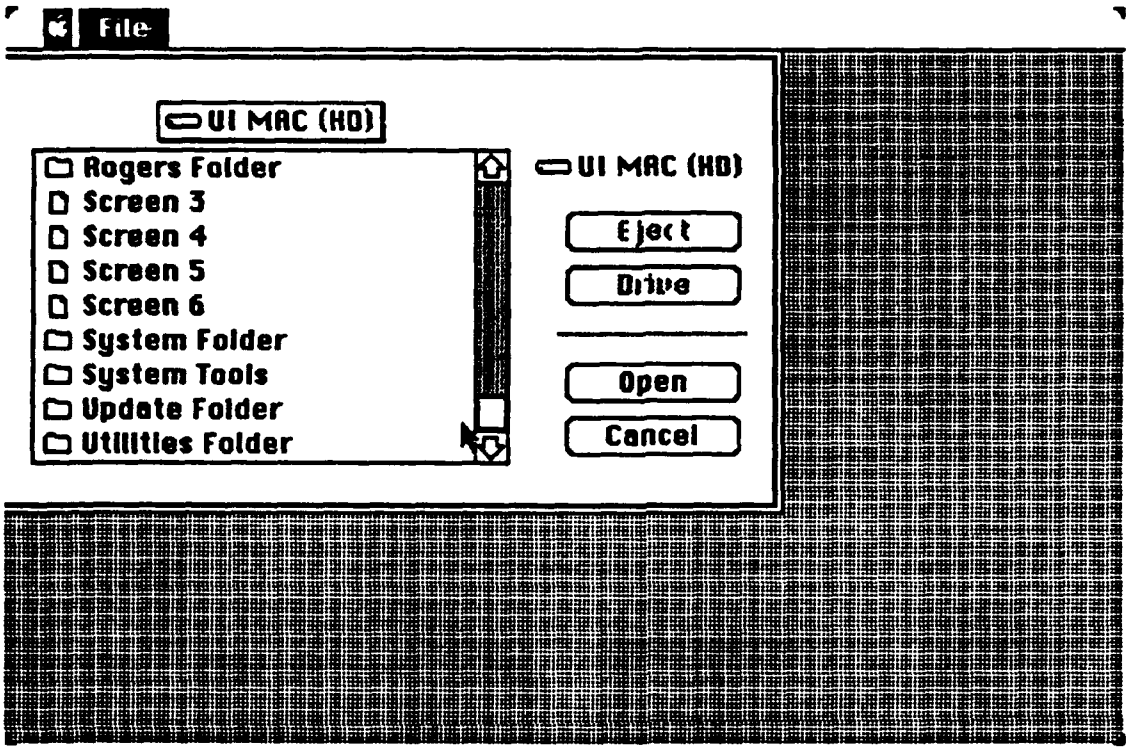

Figure 5-3 Selecting MacPaint Document to be Converted

The application will then display a 3/8's version of the MacPaint file for viewing as shown in the following figure.

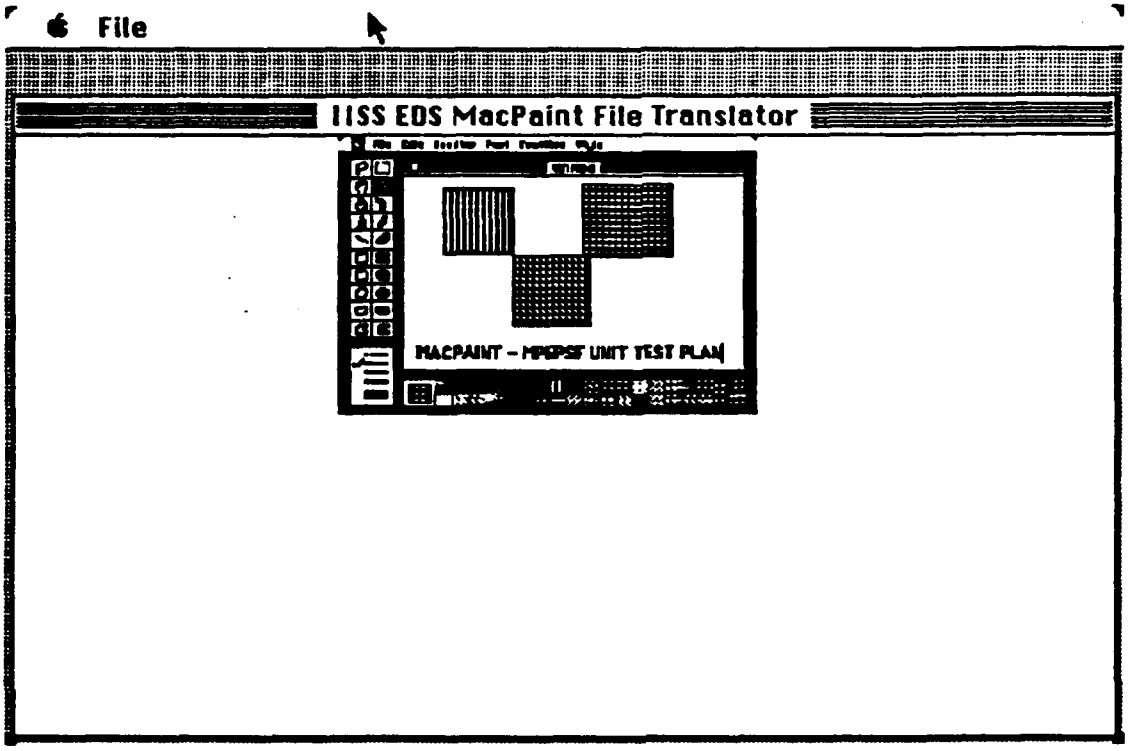

Figure 5-4 Viewing the MacPaint Test Image

The tester must then convert the MacPaint file to EPSF by choosing the CONVERT item from the FILES Menu. The name of the resultant output file must be supplied before the file can be converted as shown in Figure 5-5.

Once the file is converted, the tester should exit the MPEPSF application by choosing the QUIT item from the FILES menu.

The converted file must then be sent to the VAX using any available file transfer program such as Kermit, MacTerminal, or Red Ryder. Once the file is on the VAX it must then be printed on a Postscript compatible output device. Be sure that the file is printed on the VAX with the following qualifiers: /NOHEAD, /NOTRAIL, /NOFLAG, and /NOBURST.

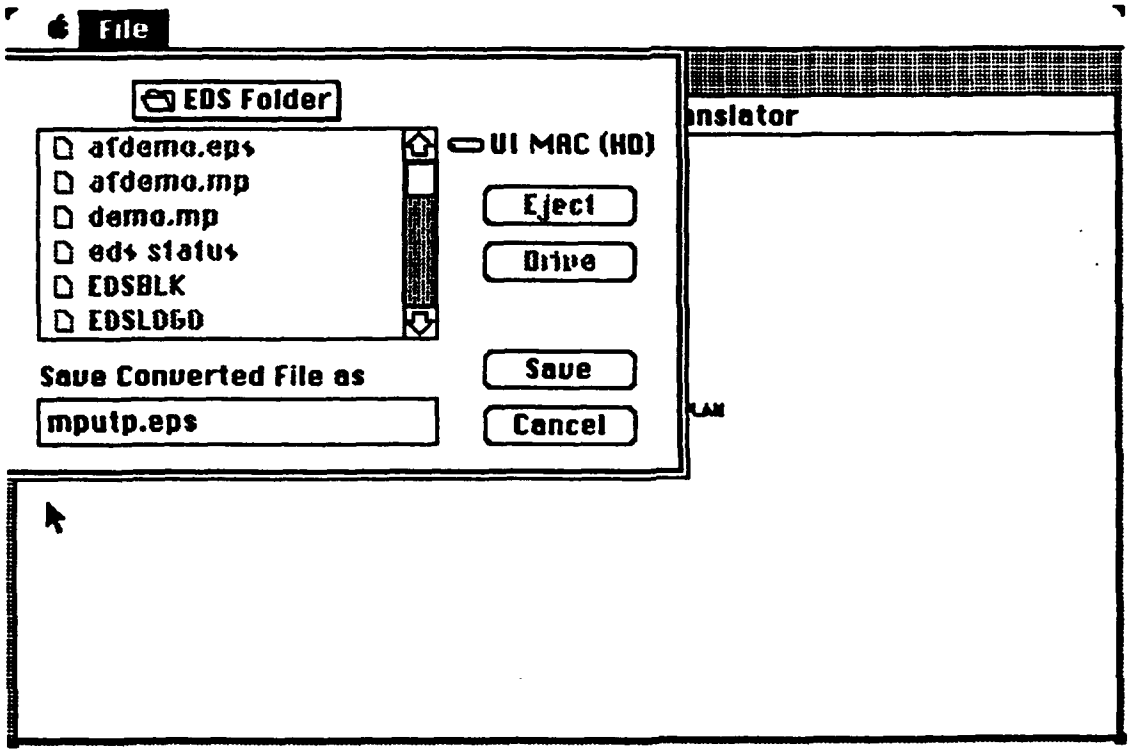

Figure 5-5 Saving the Converted MacPaint Test Image

The test is successful if the output document matches the document created by the tester using MacPaint.

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