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AUTHOR Galyon, Rosalind; And Others
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ABSTRACT

Based on an earlier user's guide to a minicomputer page layout system called PLA (Terrell, 1982), this guide is designed for use in the development and production of text-graphic materials for training relatively unskilled technicians to perform complex procedures. A microcomputer version of PLA, MicroPLA uses the Commodore 8032 microcomputer to support the production of job aids and training materials using the formats known as Fully Proceduralized Job Performance Aids (FPJPA) and Procedure Training Aids (PTA). The two main sections of this handbook contain: (1) a description of the processes involved in preparing data for use with MicroPLA, including documentation of the procedures to be taught, organizing the information into pages, writing procedures, and preparing worksheets for entering data into the computer; and (2) a job performance aid on how to actually enter the format data into the MicroPLA routine and run the program. Four appendices provide sample pages of instructional materials created using MicroPLA, a format model for designing procedure training aids, a listing of MicroPLA system error messages, and a master templet for measuring default picture sizes. Numerous illustrations throughout the text supplement the written instructions for using the system. (JB)

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TECHNICAL REPORT 162

MICROCOMPUTER PAGE LAYOUT (MICROPLA) ROUTINE FOR TEXT-GRAPHIC MATERIALS: USER'S GUIDE

DECEMBER 1984

Technical Report 162

MICROCOMPUTER PAGE LAYOUT (MICROPLA) ROUTINE FOR TEXT-GRAPHIC MATERIALS: USER'S GUIDE

Rosalind Galyon
Steve Soloman
Richard Braby

Training Analysis and Evaluation Group
Naval Training Equipment Center
Orlando, FL 32813

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This user's guide describes computer routines called MicroPLA for automating the layout of highly illustrated pages describing equipment operation and maintenance procedures. This guide enables the relatively inexperienced author to prepare job performance aids and portions of procedure training aids. It describes how to (1) document procedures to be presented and (2) employ MicroPLA to lay out text-graphic materials.

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TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

INTRODUCTION

PROBLEM

The increased complexity of military equipment combined with a decreasing manpower pool with questionable quality and rapid turnover of junior personnel has created a need for greater efficiency in training. Text-graphic instructional materials that describe how to operate and maintain military equipment have proven successful both as procedure learning aids and job performance aids. However, the high cost of developing text-graphic materials has restricted usage to research projects and a few well supported programs.

OBJECTIVE

Computer routines to automate the composition of text-graphic materials substantially reduce the high cost incurred by the otherwise labor intensive work of creating the graphic art and composing complex pages of illustrations and text. This report is a contribution to this cost reduction effort. It is designed to aid the user of MicroPLA, a microcomputer based page layout system for text-graphic materials, in:

- preparing data for entry into the computer, and
- employing MicroPLA to lay out text-graphic materials.

BACKGROUND

This guide is similar to and based upon an earlier user's guide to a minicomputer based page layout system called PLA (Terrell, 1982). MicroPLA is similar to PLA except that the code has been modified to run on small microcomputers.

MicroPLA was developed to support the production of Fully Proceduralized Job Performance Aids (FPJPA) and Procedure Training Aids (PTA). The FPJPA format was developed over a series of years (Folly, Joyce, Mallory, and Thomas, 1971) to guide relatively unskilled technicians in performing complex procedures. The technician reads the FPJPA as each step is performed. The PTA format was developed to teach equipment operators and technicians to perform procedures from memory. The PTA guides student practice but is not used during on the job performance (Braby, Brown, and Smode, 1982).

Both FPJPA and PTA formats are being incorporated into the Naval Technical Information Presentation Program (NTIPP) at the David W. Taylor Naval Ship Research and Development Center. NTIPP is a major effort by the Navy to use current technology in the publication of training materials and technical manuals for operating and maintaining military equipment. The Chief of Naval Education and Training (CNET) tasked TAEG to support the NTIPP effort since the technical manuals and training materials will be employed in CNET managed "C" schools.

MicroPLA was designed to be used in producing materials with either FPJPA or PLA format and its development was in support of both CNET and NTIPP.

ORGANIZATION OF THE REPORT

This guide contains two main sections and four appendices. The first section describes the processes involved in preparing data for use in MicroPLA. These processes include how to: (1) describe the steps in the procedures to be taught, (2) organize the description of the procedure into information pages which meet the requirements of the procedure training aid format, and (3) prepare worksheets with picture dimensions and picture-text relationships which will be entered into the computer routine as format data. The following section is a job performance aid on how to actually enter the format data into the MicroPLA routine and run the program.

Appendix A contains sample pages of instructional material created using MicroPLA. Appendix B is the format model for designing procedure training aids. Error messages for the MicroPLA system are listed in appendix C. A templet master used to produce overlays for measuring default pictures sizes is contained in appendix D.

PREPARING DATA FOR USE WITH MICROPLA

This section provides directions on how to:

- document the procedures to be taught
- organize the information into pages
- write procedures clearly
- prepare worksheets for entering data into the computer.

DOCUMENT THE PROCEDURE

The first task is to collect and organize descriptions of each step in the procedure to be taught. Many procedures will have an official checklist. The checklist will provide a sequence of the steps, but will not provide much information about how to perform the procedure. Procedures that do not have a checklist may have no formal organization other than that given by the subject matter experts (SME) in the actual performance of the procedure. If a checklist does not exist, one must be created for the procedure. Document the performance of the procedure to be taught in the following manner:

1. Use the procedure checklist to organize the sequence of steps in the PTA.

2. Observe a SME performing the procedure. Describe clearly and briefly the following:

   - operator actions performed in each step of the procedure
   - critical observable equipment responses (if any) to the action performed at each step
   - operator reactions to equipment responses as they occur.

3. Create line drawings or photographs which illustrate each action and visual response.

4. Assemble a number of SMEs to review the illustrations and written descriptions of the procedure. Revise the descriptions until the SMEs arrive at a consensus that the procedure is described as it should be taught.

5. Group the steps of the procedure into clusters that logically fit together. Large clusters (more than seven steps) should be divided into two or more smaller clusters.

ORGANIZE THE INFORMATION INTO PAGES

Utilization of the PTA format requires the preparation of four distinct types of pages:

Information	-	Introduces all information taught in the PTA
Paraphrase	-	Provides self checks on memory of information presented by the information pages
Road Map	-	Provides an opportunity for prompted practice in the performance of the procedure through chaining drills called finger tracing exercises
Mock-up	-	Provides an opportunity for unprompted practice in the performance of the procedure requiring recall of the steps.

The MicroPLA routines are used in creating the information pages and the paraphrase pages which are variations of the information pages. The road map and mock-up pages are easily constructed by hand and are not supported by the MicroPLA routines. The components of the information page are shown in figure 1. (See appendix B for a detailed description of these PTA format pages.)

The following guidelines are used to create information pages:

1. Select the steps to be included on an information page. Limit the information on a page to as few steps as practical (rarely more than four).

2. Identify in the header the checklist item to be described on the information page.

3. Illustrate the steps with an overview picture of the equipment and close-up views of the portion of the equipment related to the steps.

4. Illustrate observable equipment responses to each action whenever the responses are essential cues for performing the procedure.

5. Describe the action for each step and enclose it in a box called an "action label." An arrow should point to the location on the close-up illustration where the action takes place.

6. Describe the responses that result from each action if they are observable and are cues for taking additional action. Enclose each response in a box called a "response label." An arrow should point to the location on the close-up illustration where the response takes place.

7. Notes (including warnings, cautions, and other necessary information) can be included in "note labels" interspersed into the flow of action and response labels, as required.

8. Labels should be numbered in the sequence in which they should be read. Labels on each page start with the number "1." (The Job Performance Aid in this User's Guide followed this style of numbering labels.)

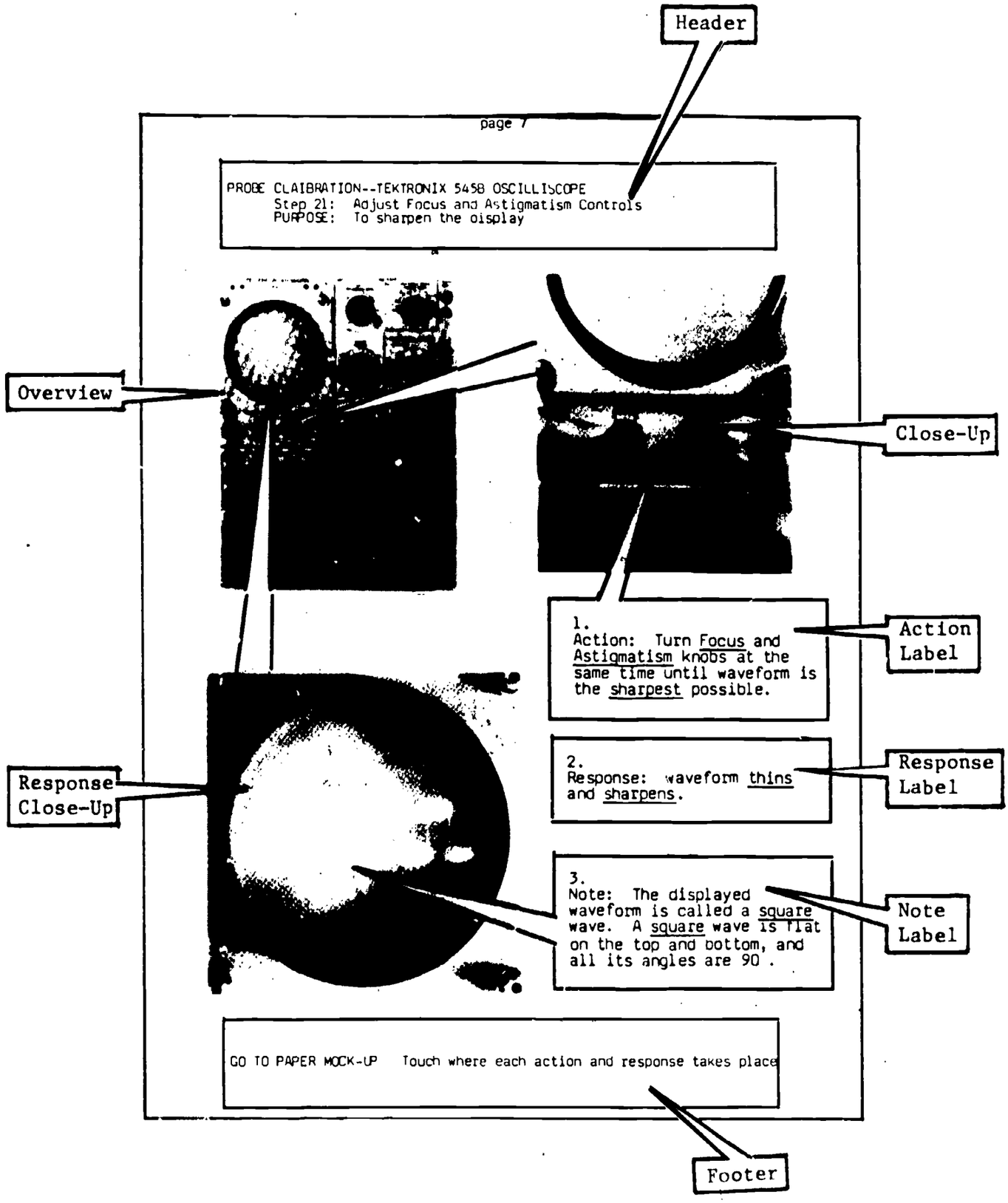


Figure 1. Information page.

9. Underline key words or numbers that must be remembered while performing the procedure.

10. Include directions to the learner in a footer statement at the bottom of each page.

FPJPA pages are almost identical to one of the pages in the PTA, the information page. The difference is that the footer of a FPJPA page is not used to direct the student to practice. Therefore, in this User's Guide, special directions are not provided for making FPJPAs. These FPJPAs can be constructed by following the general directions for creating information pages.

WRITE PROCEDURES CLEARLY

Writing style is critical to the success of a PTA. Authors should ensure that the writing is clear and understandable. Use active voice rather than passive voice when preparing label text. An illustration of the differences between the active voice and passive voice is shown below. Active voice tends to be terse and encourages readers to perceive themselves performing the actions. Passive voice tends to be wordy and obscures the intended action.

PASSIVE VOICE	ACTIVE VOICE
The Vertical Gyro switch must be set to the port position. The Port position for the Vertical Gyro switch is in the up direction.	Set Vertical Gyro Switch to Port(up).
The four Hardover switches should be checked to determine whether they are in the off position. Also, the covers for the Hardover switches must be returned to the down position after the check is completed.	Check to ensure 4 Hardover switches off (covers down).

PREPARING WORKSHEETS FOR ENTERING DATA INTO THE COMPUTER

Worksheets are used to prepare data for entry into the MicroPLA program. These worksheets are written records of the contents of a page as well as a set of notes to aid in the data entry process. Also, worksheets make it easy to edit and revise MicroPLA page data and to create the paste-up of camera-ready pages.

Worksheets should be prepared in the following manner:

1. Write the header to identify the specific checklist item addressed on the page.

2. Select next label number and write ACTION text.

3. Identify where the ACTION occurs in the illustration.

4. Describe the system response, if any.

5. Record any essential notes necessary to carry out that element of the procedure.

6. Return to step 2 if there are more actions for that checklist item.

Specific data elements used in preparing worksheets include the following:

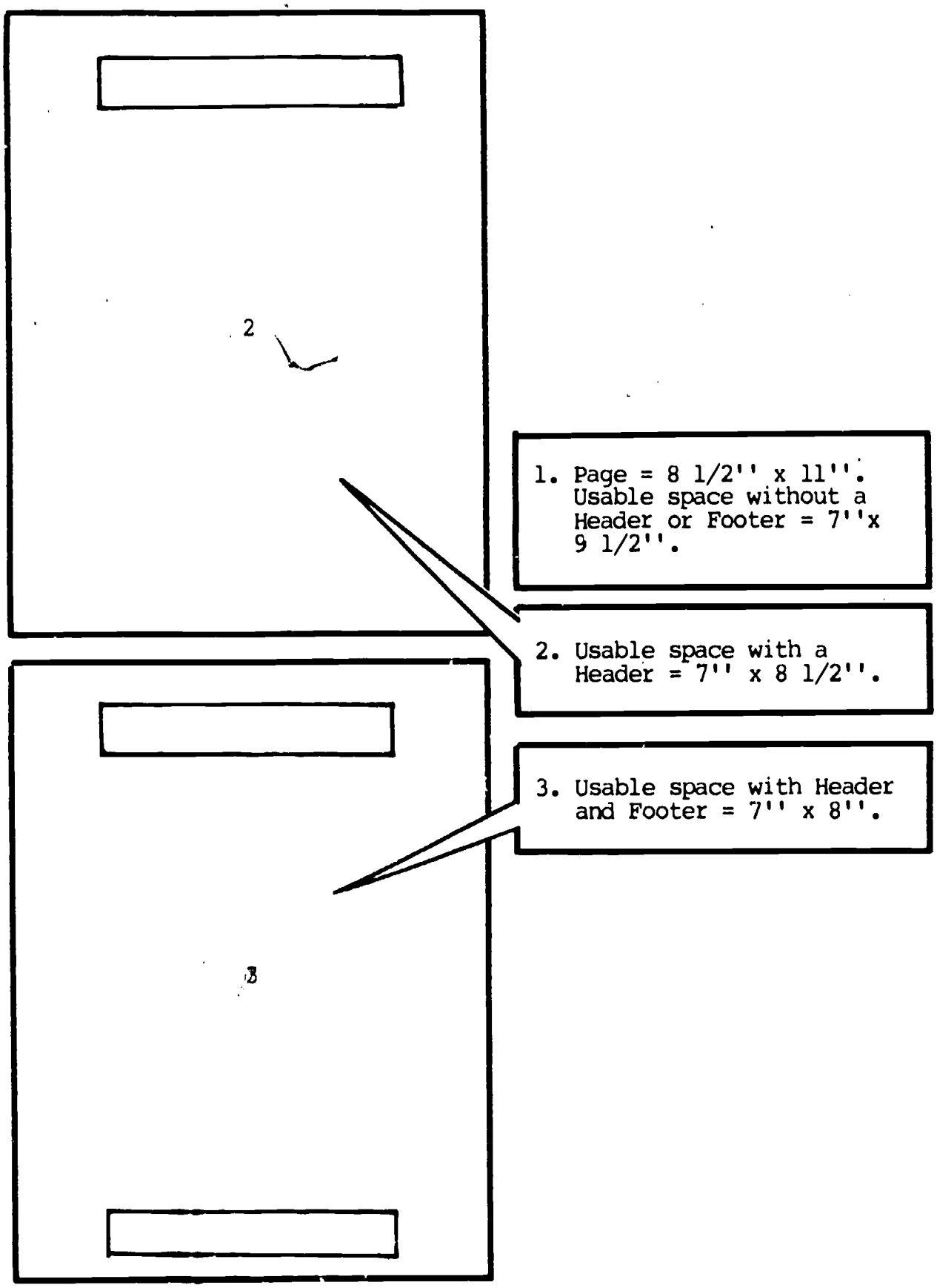
- page dimensions
- header and footer
- picture identification
- labels
- picture dimensions
- picture and label relationships.

These data elements are described and illustrated on the following 6 pages. Compiling these data elements onto worksheets (one worksheet for each page) will bring together all the information needed as input data for using MicroPLA.. The next section provides directions for entering this information into the MicroPLA program.

Technical Report 162

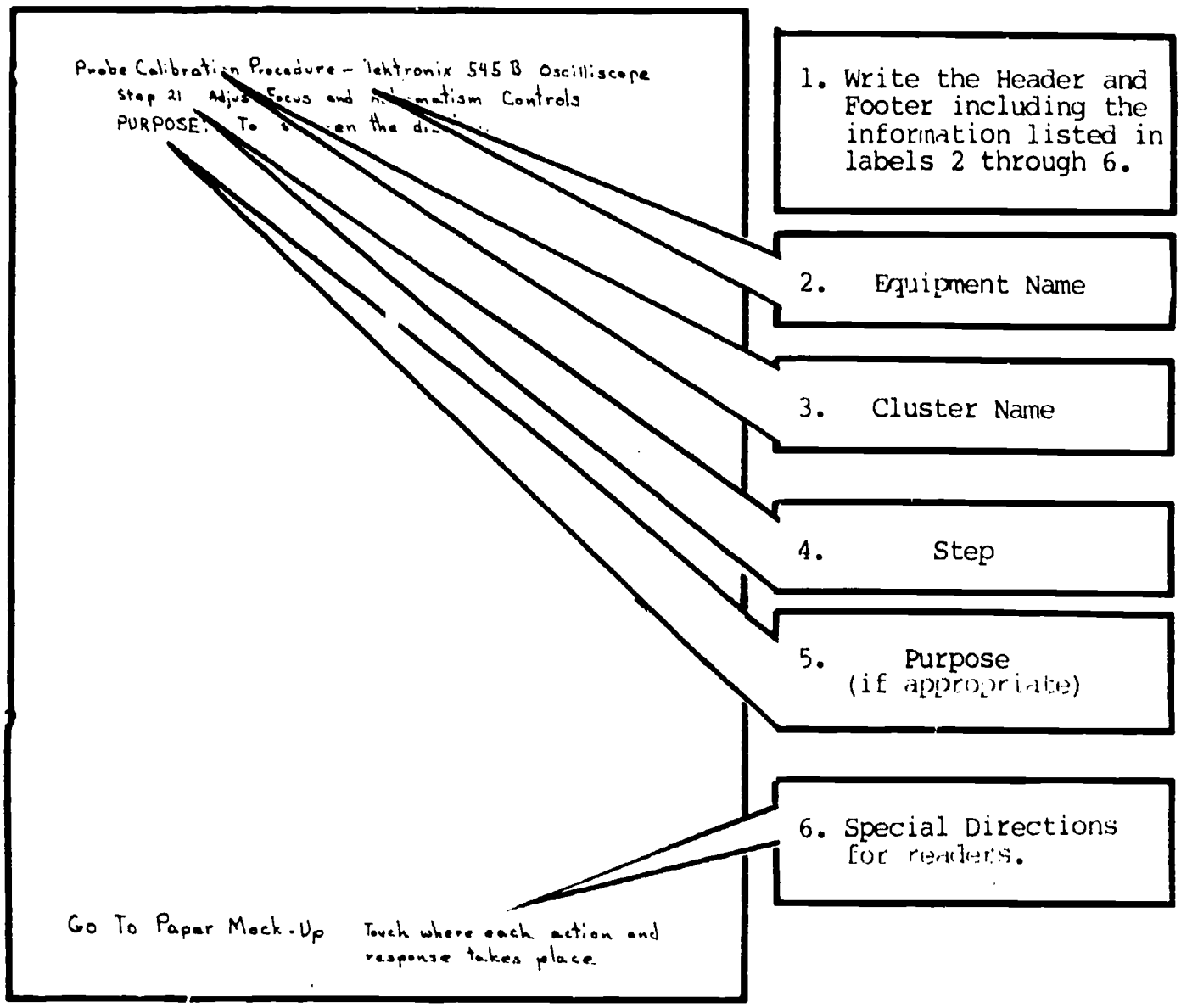
MICROPLA: DATA PREPARATION - WORKSHEETS

PAGE DIMENSIONS



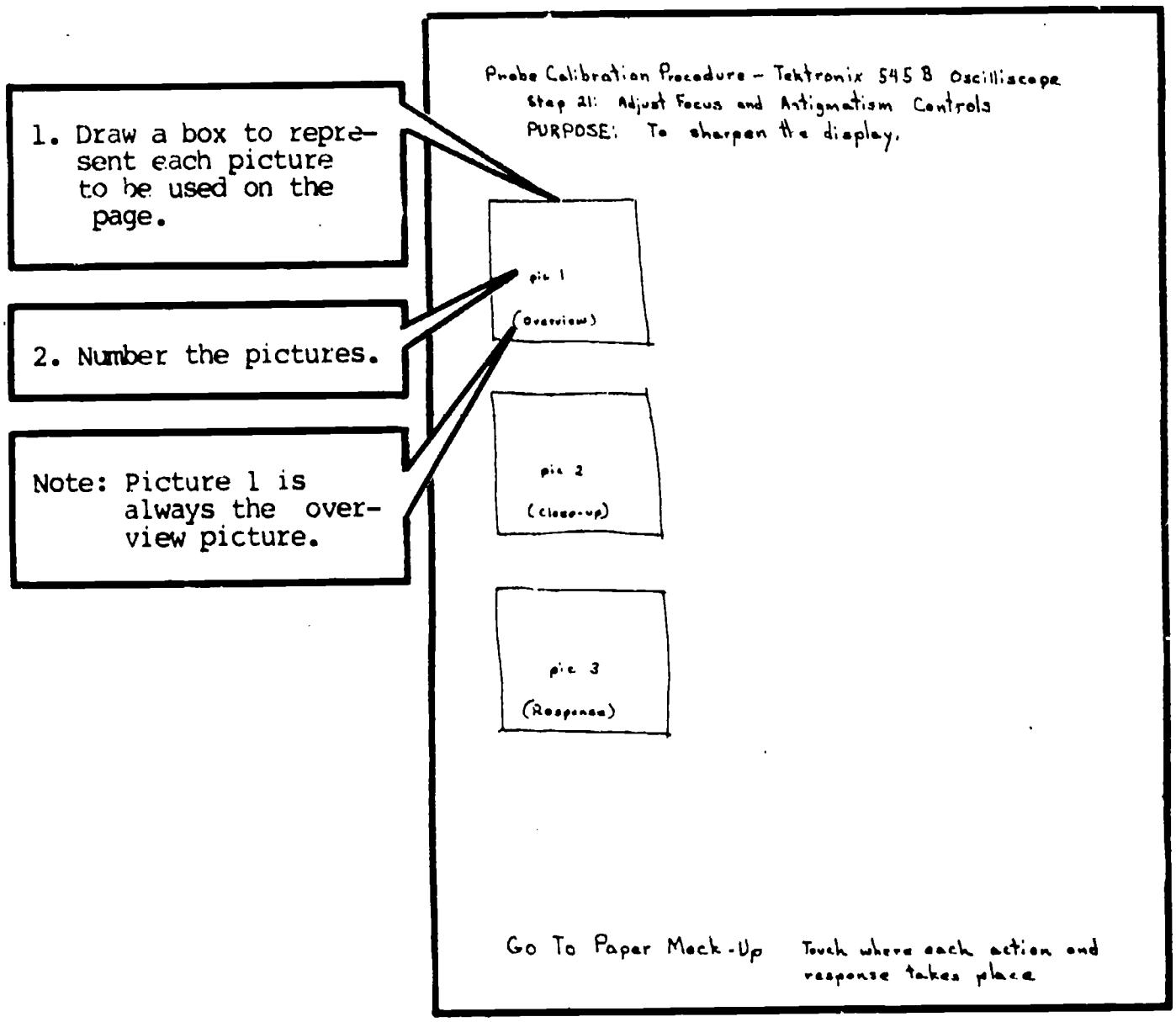
MICROPLA: DATA PREPARATION - WORKSHEETS

HEADER AND FOOTER



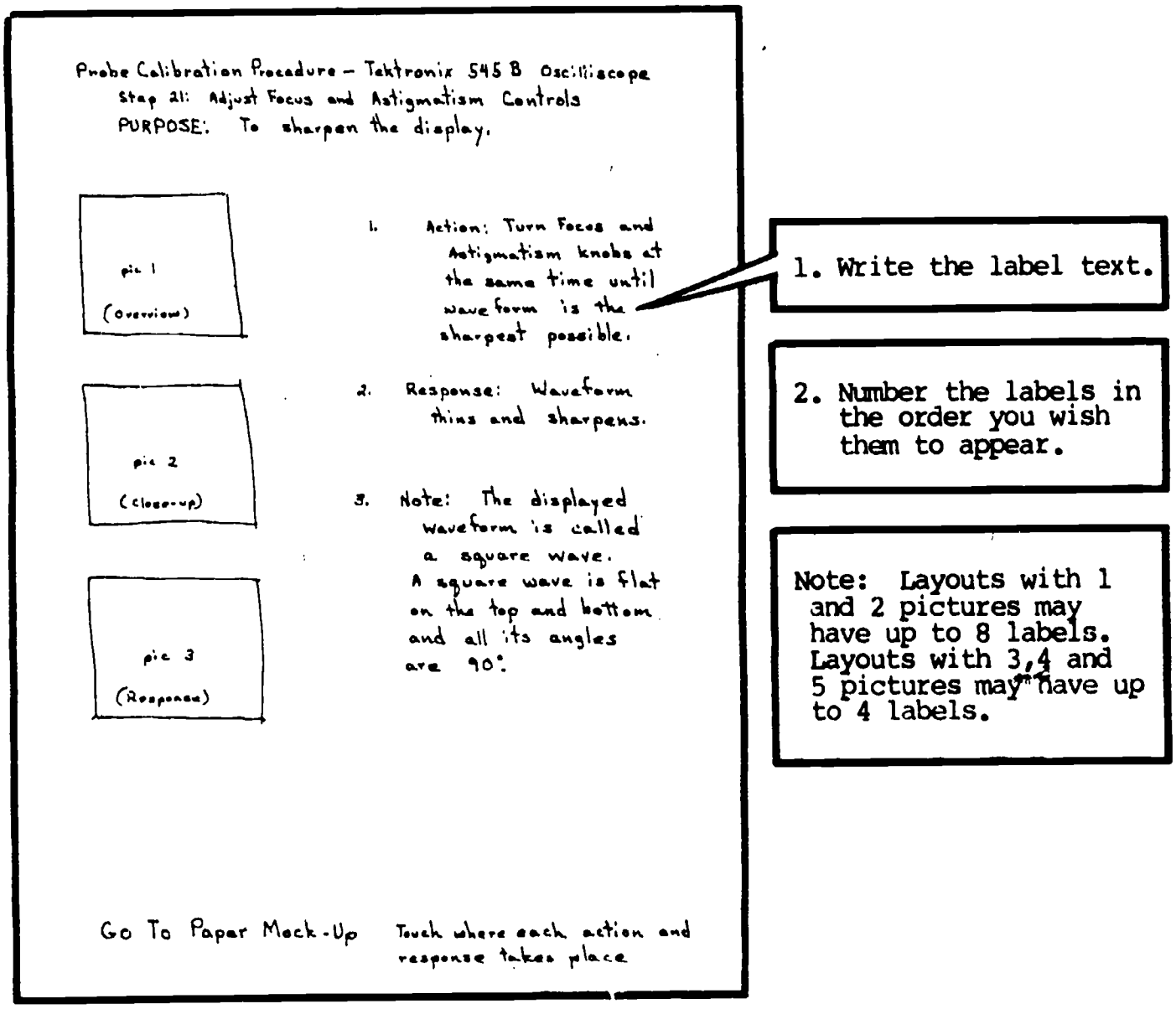
MICROPLA: DATA PREPARATION - WORKSHEETS

PICTURE IDENTIFICATION



MICROPLA: DATA PREPARATION - WORKSHEETS

LABELS



MICROPLA: DATA PREPARATION - WORKSHEETS

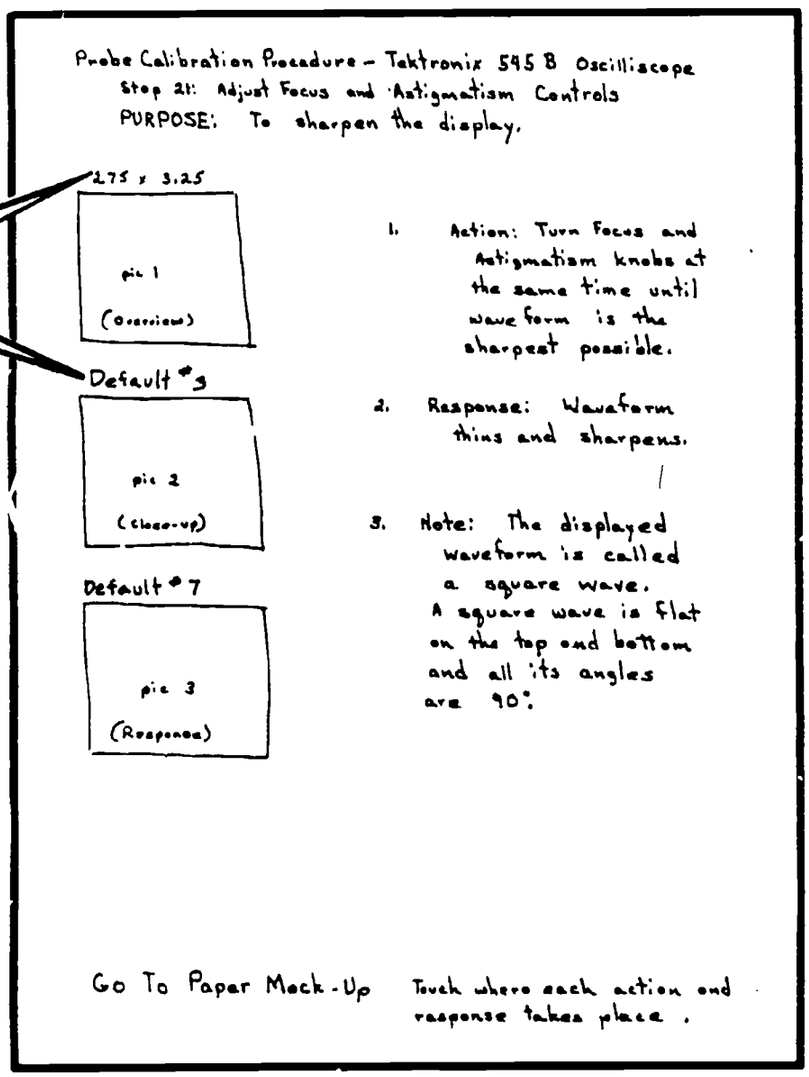
PICTURE DIMENSIONS

1. Record the picture dimensions or default size on top of the pictures.

Note: Picture dimensions are entered as decimals rather than fractions.

Note: The first number in picture dimension is width, the second number is height.

Note: If the picture is a standard size and shape, it will be easier to enter a default size (a two digit number). Lay the plastic templet (page 83) on the picture to determine which default value to use.



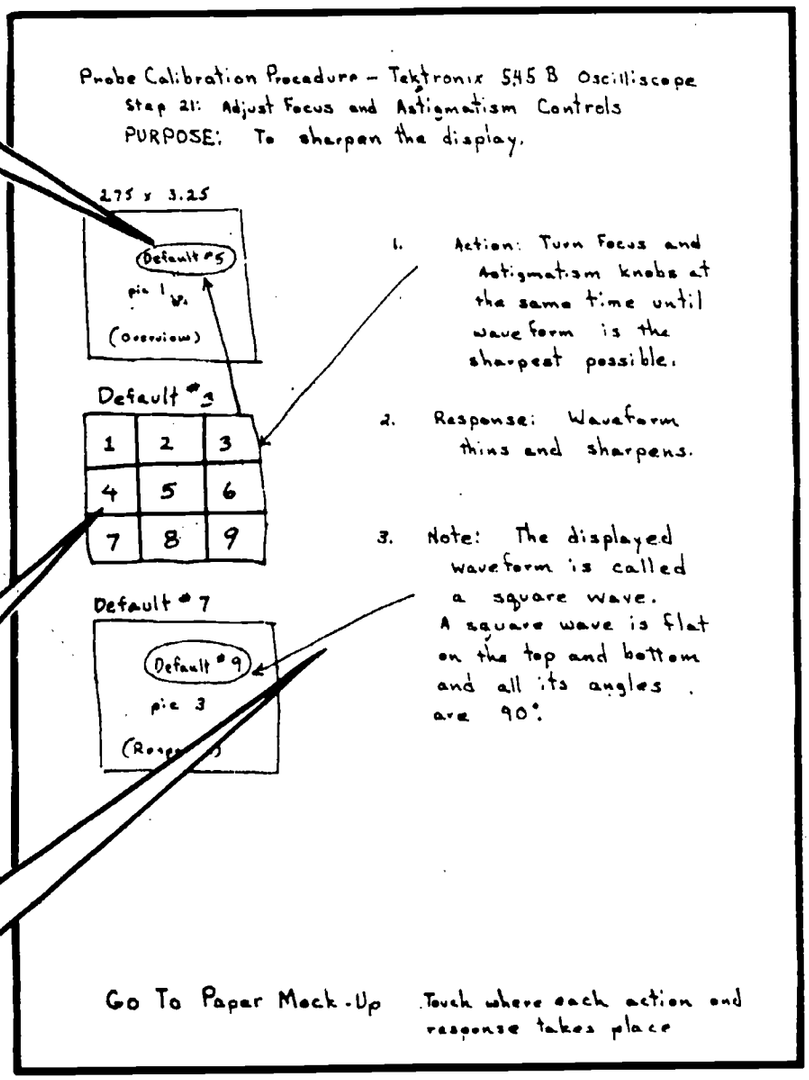
MICROPLA: DATA PREPARATION - WORKSHEETS

PICTURE and LABEL RELATIONSHIPS

1. Record the actual coordinates or the default locations where the darts end. Circle them so that they are not confused with the dimensions.

Note: In cases where the darts are dispersed throughout the picture, use the default locations for dart points. This can be done quickly, without measuring. The picture is divided into 9 cells. Record the default value (i.e., number in cell) for the general location in the point of the dart.

2. Draw arrows to connect pictures and labels with their circled coordinates.



Note: Some labels and pictures will not be connected to others, thus, will not have coordinates.

After all worksheets are completed, enter the data as input for the MicroPLA program.

A JOB PERFORMANCE AID FOR CONSTRUCTING PAGES WITH MICROPLA

This section contains detailed instructions for using the MicroPLA program to create information pages. It includes how to run the MicroPLA program, create and edit MicroPLA files, and generate, display, and print page layouts. A description of equipment requirements and a brief overview of the program segments within MicroPLA are presented as well as a Job Performance Aid (JPA) on how to use MicroPLA. (The MicroPLA program was used to lay out the instructional pages of this section.) The section is self-contained and may be used separately from the remainder of the report.

Learning the MicroPLA procedure will be facilitated if each step is practiced on the computer. This practice requires at least one completed worksheet for data entry. Read the equipment requirements and the program overview and then follow the directions for running the program. Appendix A contains sample pages of instructional materials created using MicroPLA. The illustrations other than the photographs are denoted by a gray tone to avoid confusion with the labels.

EQUIPMENT REQUIREMENTS

The MicroPLA program was developed for use on the Commodore 8032 microcomputer and is presently available in the Commodore Basic 4.0 programming language.

Equipment required to utilize MicroPLA at the present time includes:

Computer	-	Commodore 8032 Basic 4.0
Disk Drive	-	Commodore 8050 Dual Drive
Printer	-	Commodore 8300P, letter quality printer with Tractor feed

Two diskettes are required for the program operation. One diskette contains the MicroPLA programs and the other is used for project files and work space.

Federal agencies can obtain the MicroPLA software by sending a written request along with a double density single-sided diskette to Commanding Officer, Naval Training Equipment Center (Code 1), Orlando, Florida 32813.

MICROPLA OVERVIEW

Figure 2 Outlines the six segments of MicroPLA operations. The outline includes a brief description of each segment and will assist the reader in understanding the relationships of the various operations of MicroPLA.

HINTS FOR EFFECTIVELY USING MICROPLA

The job performance aid takes you through the entire process of creating a page from data entry to printout. However, MicroPLA is most effectively used when page generation, viewing and printing is delayed until all the data for a project's pages have been entered. The entire set of pages can then be generated, viewed and printed. Generating and viewing a single page can be done at any time if there is an immediate need to know if a page is acceptable. However, this significantly slows the process of creating a document.

The JPA should be used in the following manner:

1. Check the header to identify the program segment and specific procedure addressed on the page.

2. Read label number one and the adjacent notes.

3. Identify where the action occurs in the illustration.

4. Perform the action required, if any, and go on to the next numbered label.

JOB PERFORMANCE AID

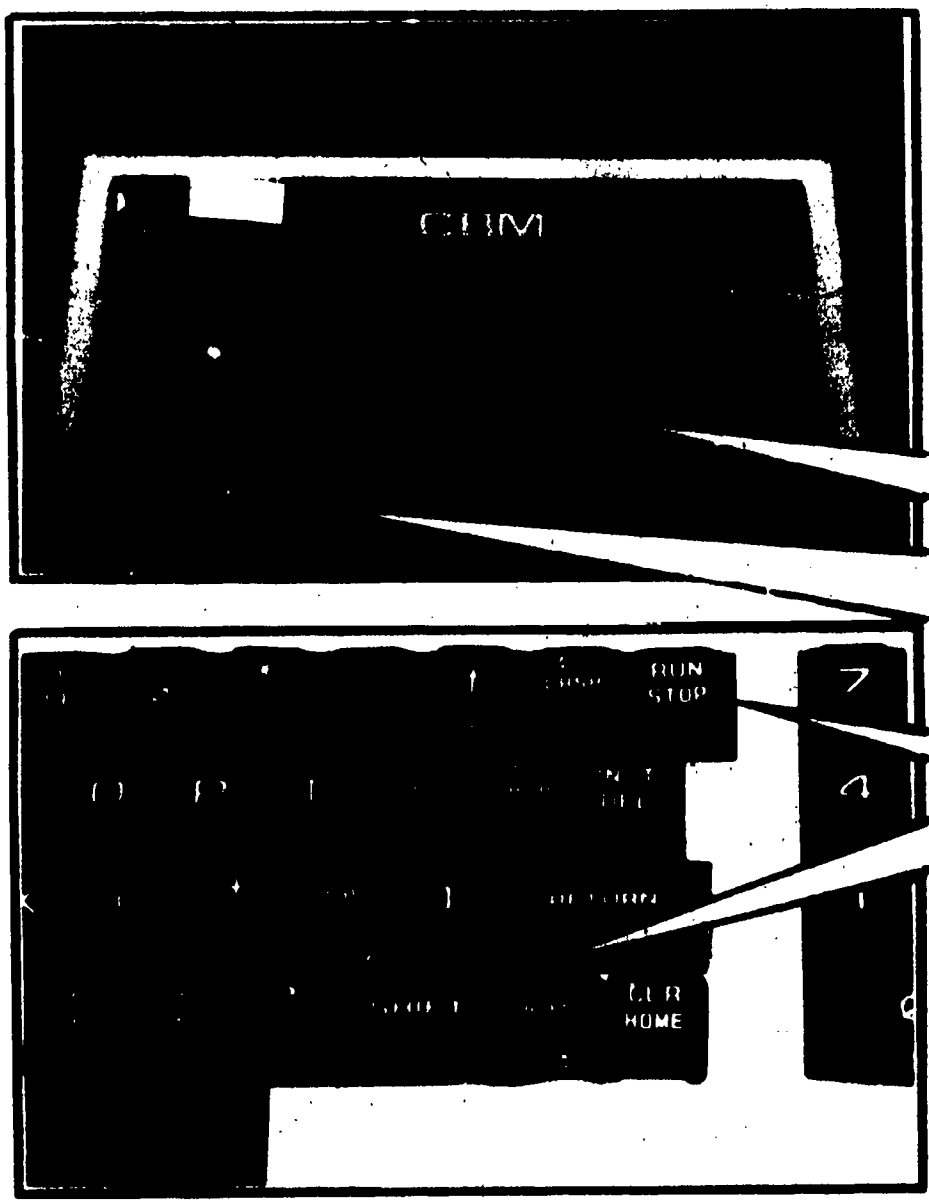
The remainder of this section is the job performance aid, designed to instruct the reader in the step-by-step use of MicroPLA.

I ACCESSING THE MICROPLA FILE	Segment I describes loading the disks and running the MicroPLA program.	Page 24
II CREATING/EDITING FILES	Segment II describes the creation of new files for the projects, books, and pages. Included is the inputting and editing of page layout data; e.g., picture dimensions, picture-label relationships, header, footer, and labels.	Pages 25-41
III PAGE LAYOUT GENERATION	Segment III describes how page layouts are generated using the page layout data created in segment II. Included is a computer layout data printout and error statements to aid the author in the analysis of problems which prevent the generation of a page with the given page layout data.	Pages 43-45
IV DISPLAY PAGE LAYOUT	Segment IV assists in the analysis of problems by providing a screen display of pages generated.	Pages 46-47
V PRINT/PLOT PAGE LAYOUTS	Segment V describes all the Print/Plot options. First is the choice of either printing an information page or a paraphrase page. Second is the choice of the conditions under which arrows are or are not printed. Third is whether to print the header and/or footer borders. The final choice is whether to print a camera-ready copy or a high speed copy for proofing.	Pages 48-53
VI END OF SESSION	Segment VI is an end of session message which indicates the system has been properly terminated.	Pags 54

Figure 2. Outline of the MicroPLA operations.

Segment I. ACCESSING THE MICROPLA FILE

START-UP PROCEDURES



1. Turn on the Disk Drives, Computer and Printer.

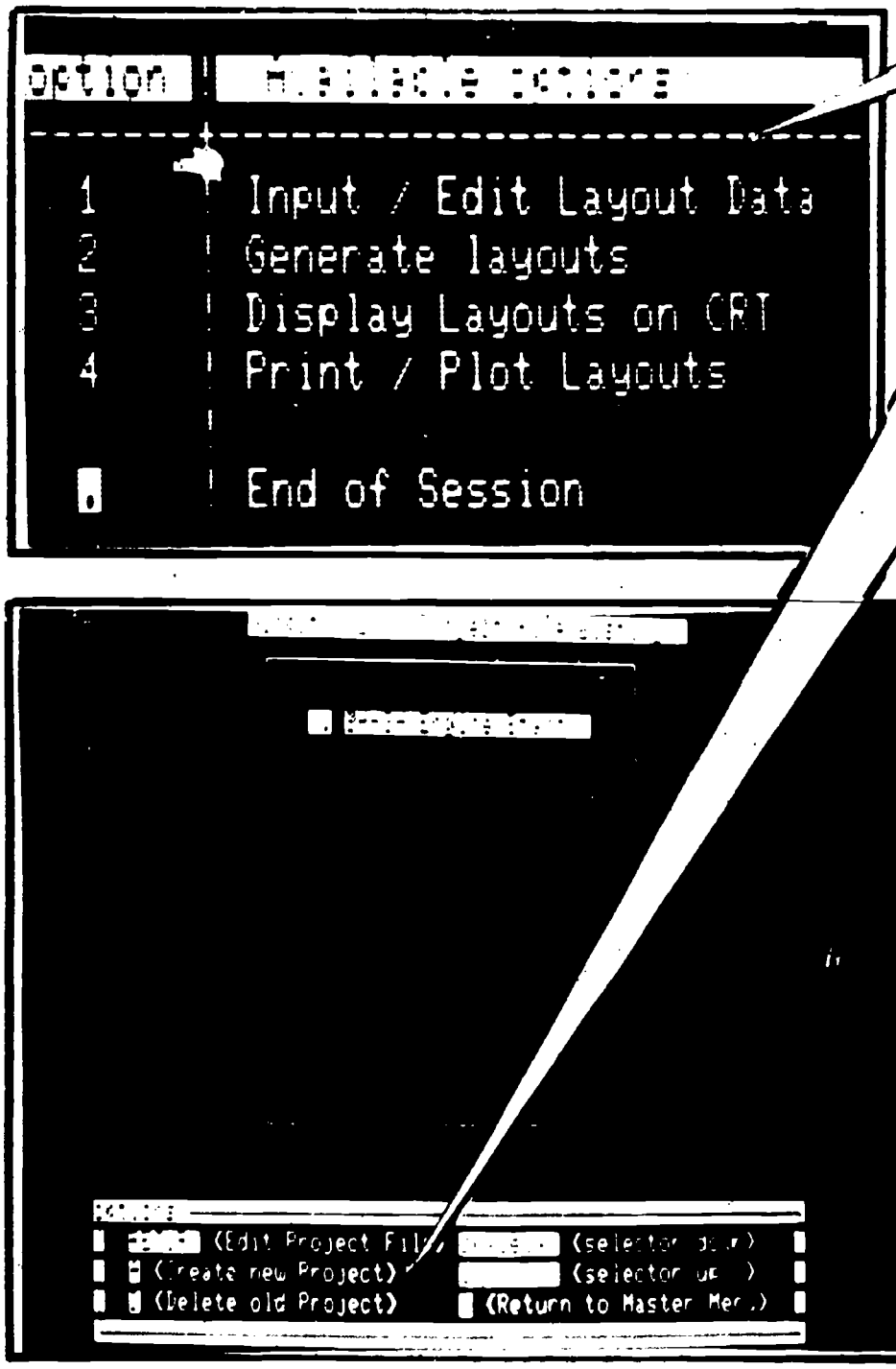
2. Insert the Program Diskette into the right drive (#0) and the Data File Diskette into the left drive (#1).

3. Key in SHIFT and RUNSTOP simultaneously to access the MicroPLA program.

4. Results: The Master Menu will be loaded and displayed.

SEGMENT III: CREATING EDITING FILES

CATALOG BOOK III



1. Key in '1' for the INPUT/EDIT option.

   Results: The project will be displayed.

2. Key in 'A' to create a new Project File.

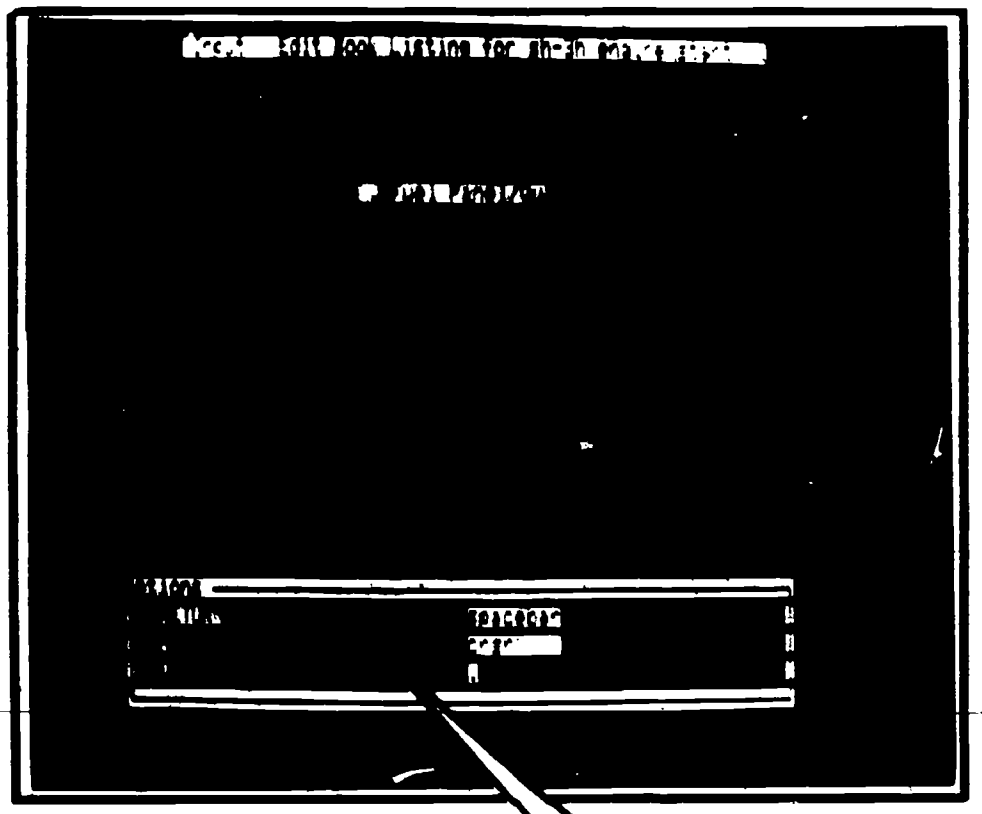
   Note: You are allowed up to 12 projects.

3. Key in the name of the project and the name of the project manager.

   Results: The Book Listing will be loaded and displayed.

SEGMENT II: CREATING/EDITING FILES

CATALOG - BOOK FILE



1. Key in 'A' to create a new Book File.

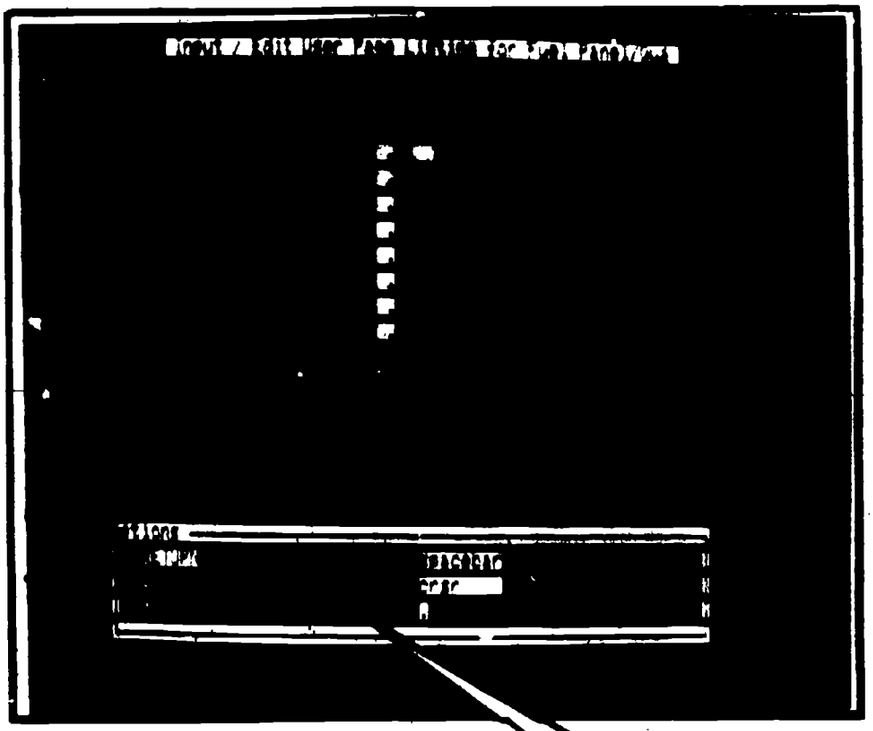
   Note: you are allowed up to 25 books per project

2. Enter the Book name.

3. Results: The User Page Listing will be loaded and displayed.

SEGMENT II: CREATING/EDITING FILES

CATALOG - USER PAGE LISTING



1. Key in 'A' to create a new page.

2. Key in the number or name of the new page (i.e.,up to three characters).

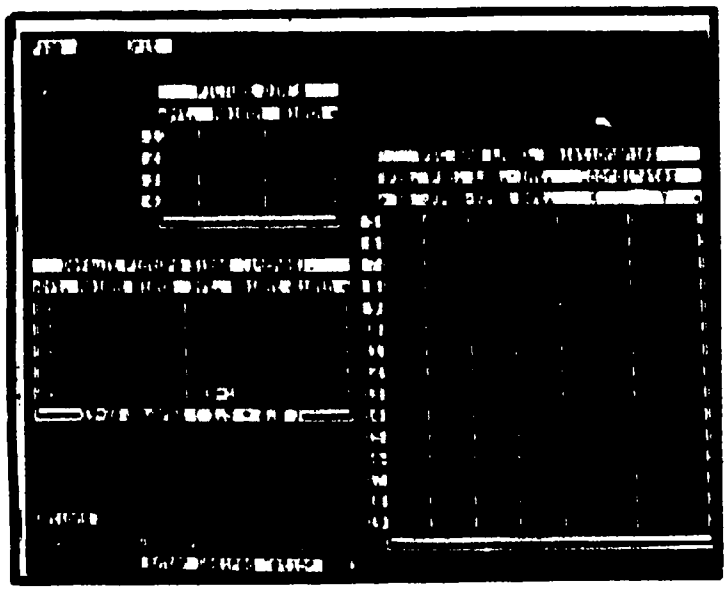
   Key in the type of units (inches or centimeters).

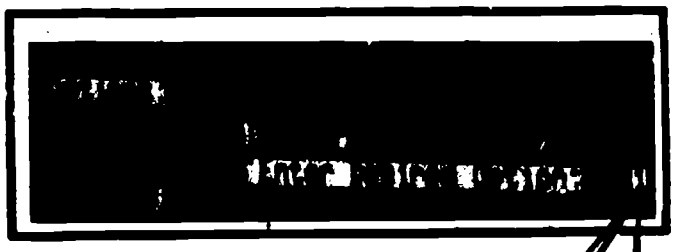
   Key in the number of pictures in the layout.

3. Results: The user page is created and the page editor is loaded and displayed.

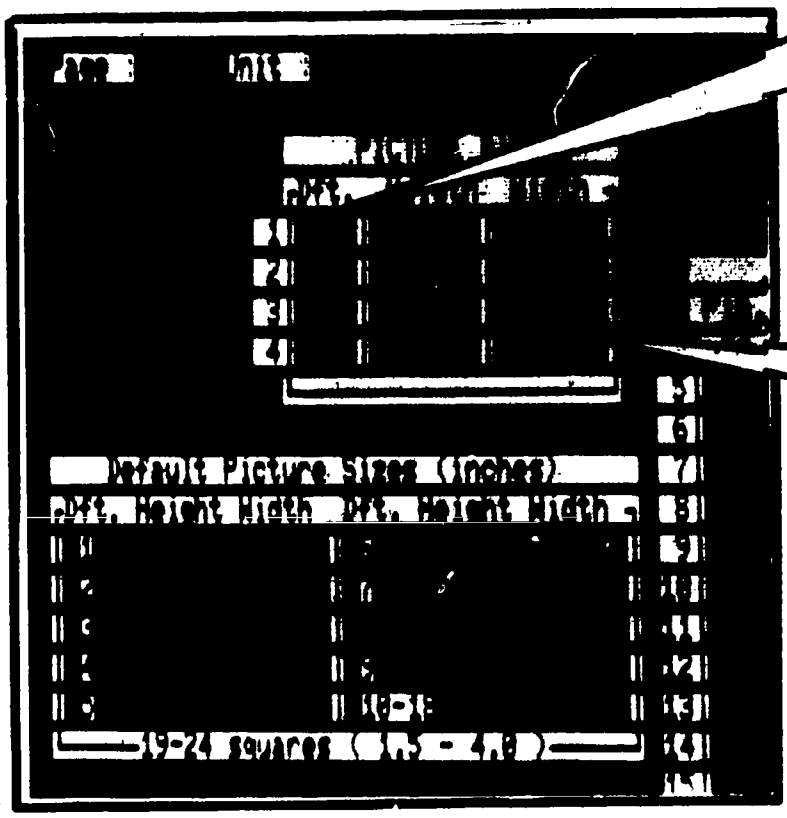
SEGMENT 11: CREATING/EDITING FILES

PICTURE DIMENSIONS





1. Key RETURN to input or edit the picture dimension information for the line number displayed at the cursor.



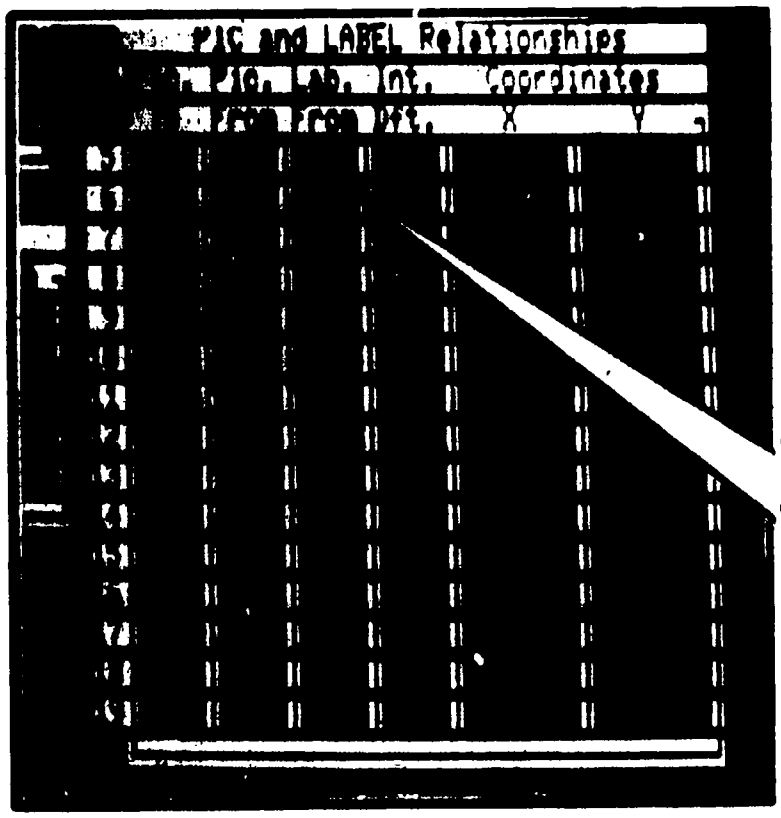
2. Enter the Default number corresponding to the picture size desired. Enter a zero if you do not want to use a standard Default size.

3. If the Default value is zero, enter the picture dimensions. You must use a digit preceding the decimal point (e.g.,0.55).

Note: If you wish to edit a line number other than the one displayed, enter the line number desired and key RETURN.

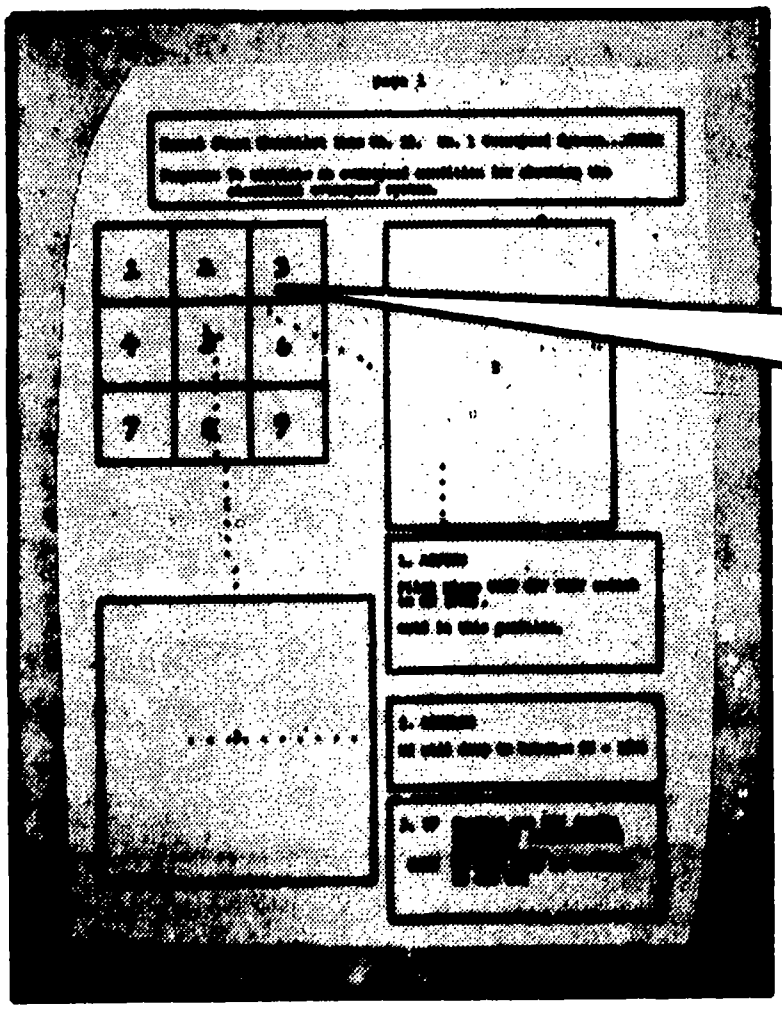
SEGMENT II: CREATING/EDITING FILES

INPUT/EDIT PAGE DATA



1. Key in the Picture to Picture and Picture to Label relationships. Use RETURN to space over columns.

Note: To - relates to which picture the dart is pointing to.
From - relates to the edge of the picture or label from which the dart originates.

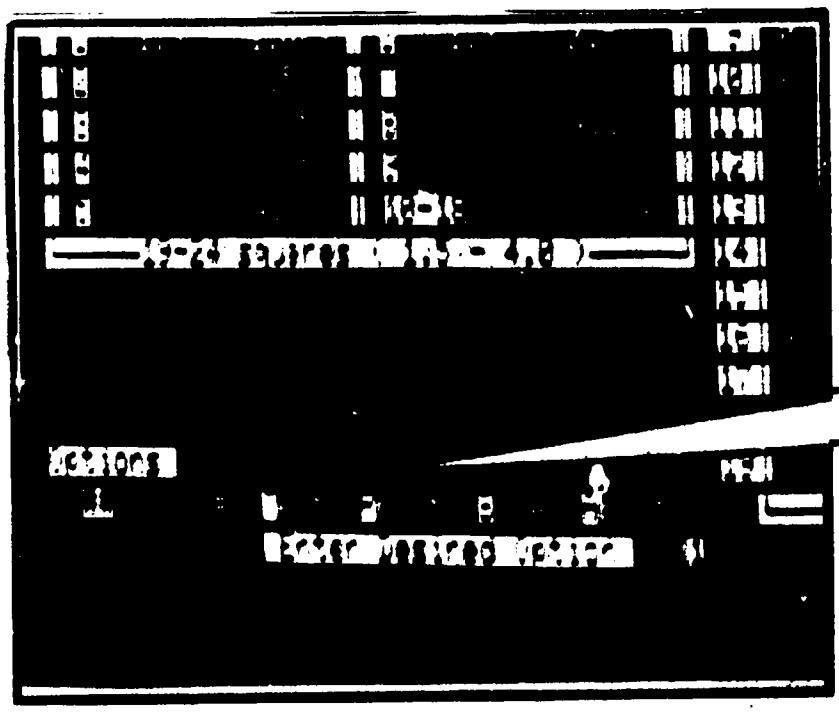


2. Key in the number of the Default Zone. If you do not use Default values key in the exact values. To enter an exact value you must use a digit preceding the decimal point (e.g. 0.55).

Note: Default Zones are fully explained in Section II of this report

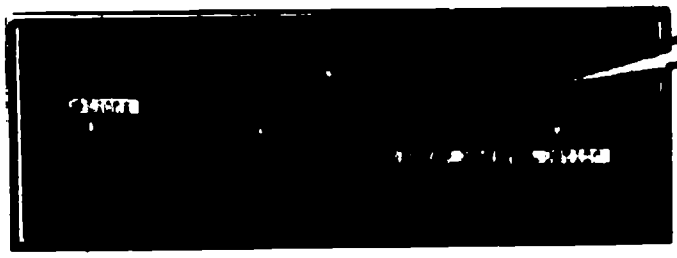
SEGMENT II: CREATING/EDITING FILES

HEADER

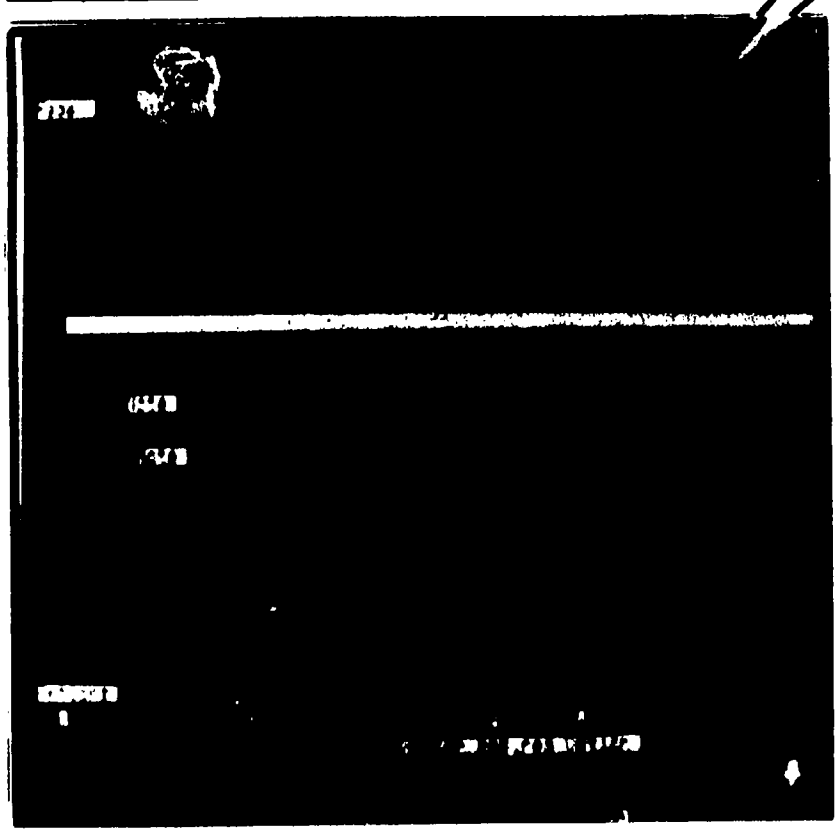


1. Key in 'T' to Input/Edit Text material.

   Results: The text options will be displayed.



2. If you wish a Header Message Key in 'H'.



3. Key in up to five lines of Header text (75 characters wide). Key RETURN to move the cursor to the next line. Note: If you wish to correct errors refer to page 35. To specify a blank Header leave the '@' in the top left corner, otherwise delete it. To underline place an ↑ at the beginning and end of the word or phrase to be underlined.

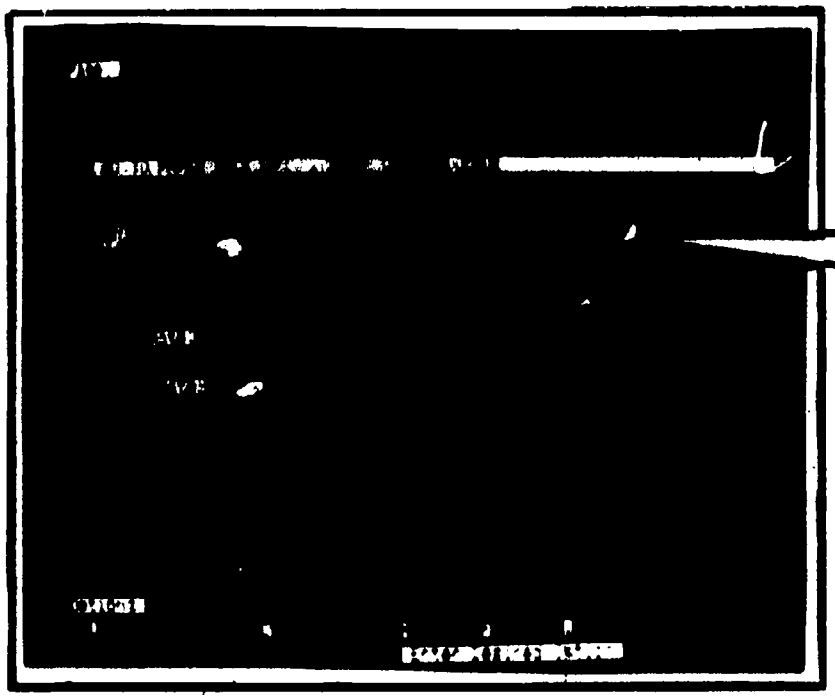
4. After the Header Message is complete, key RETURN until the Text Menu appears.

   Note: To exit via the short-cut method, key return after the text is complete, they key ESC.

SEGMENT II: CREATING/EDITING FILES

FOOTER

1. Key in 'F' if you wish a Footer Message.



2. Key in up to five lines of Footer Text (75 characters wide). Key return to move the cursor to the next line.

3. After the Footer Message is complete, Key RETURN until the Text Menu appears.

   Note: To exit via the short-cut method, key RETURN after the Text is complete, then key ESC.

Note: If you wish to correct errors, refer to page 35. To specify a blank Footer leave the '@' in the top left corner, otherwise delete it. To underline, place an ↑ at the beginning and end of the word or phrase to be underlined.

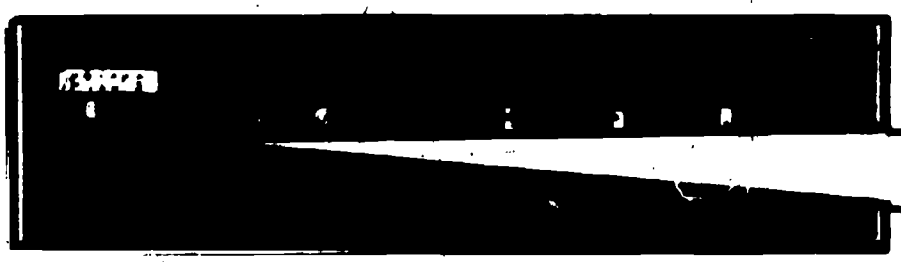
SEGMENT II: CREATING/EDITING FILES

LABELS

3. Enter the Label character width. Label character width may be manipulated to provide short-wide or tall-narrow labels. Refer to label widths on page

Note: If you wish to correct a label number, key ESC to return to the previous data entry point.

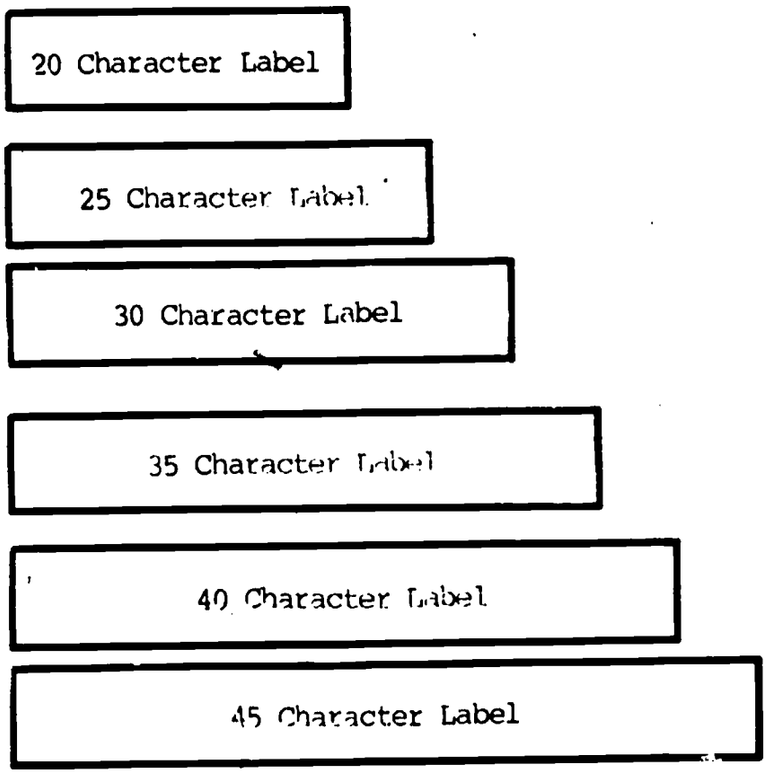
2. Key in the number of the label you wish to enter. Enter the labels in the order you wish them to appear. For example, Label 2 will follow Label 1.



1. Key in 'L' if you wish to enter a label.

SEGMENT II: CREATING/EDITING FILES

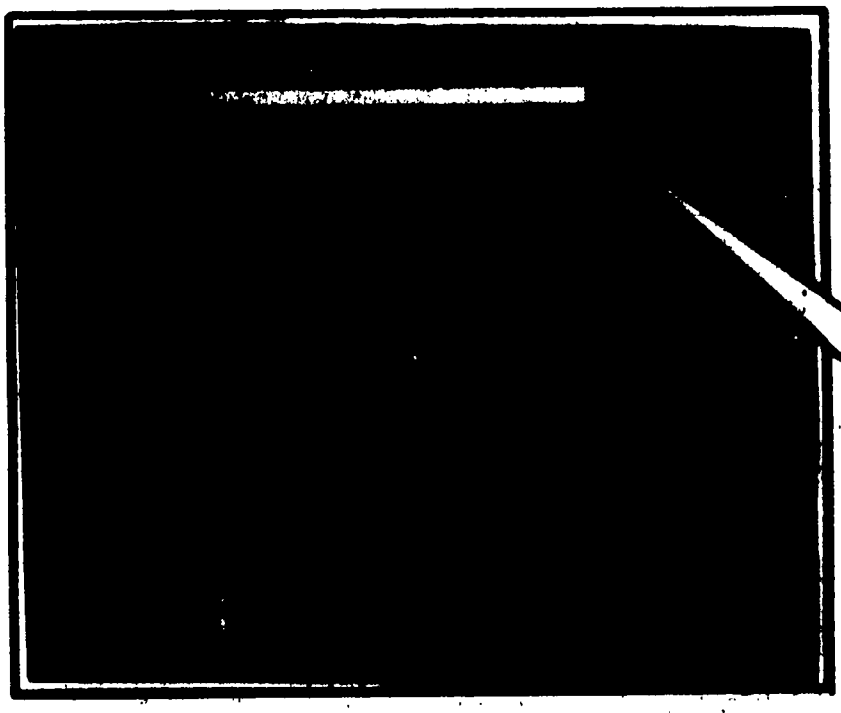
LABEL CHARACTER WIDTH



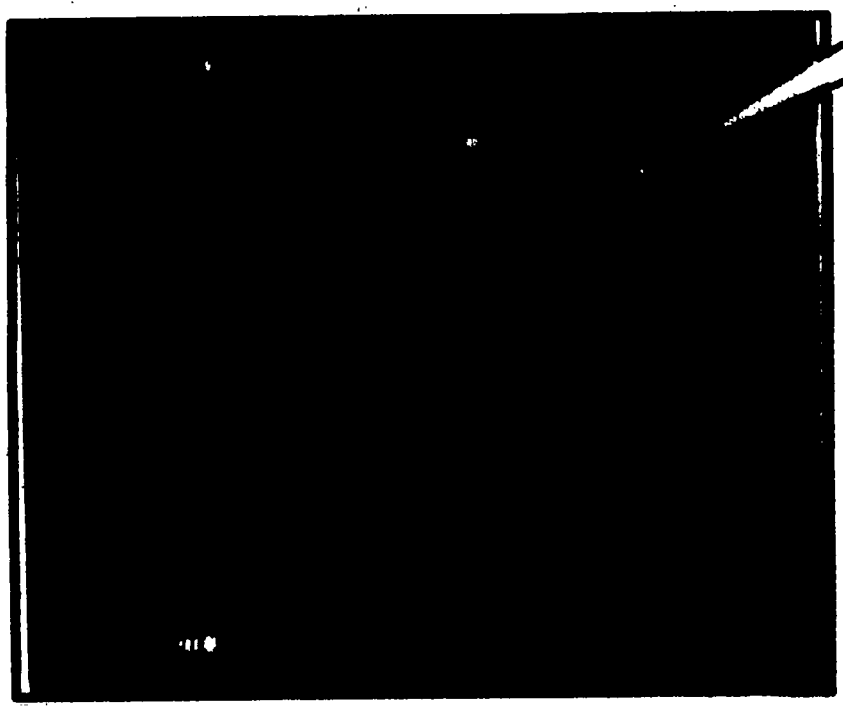
Use this Label Character Width Scale to aid in the estimation of label sizes.

SEGMENT II: CREATING/EDITING FILES

LABELS



1. Label 1 will appear with a solid line corresponding to the label character width.



2. Type in the information as you wish it to appear in the label. If you wish to correct errors, refer to page 35. If you wish to paraphrase or underline, refer to page 35.

3. At the end of the Label, key in **RETURN**, **SPACEBAR** (to end or line) and key in $.

   Note: to exit from a label via the short-cut method, key **RETURN** to one line past the desired end of a Label and key **ESC**.

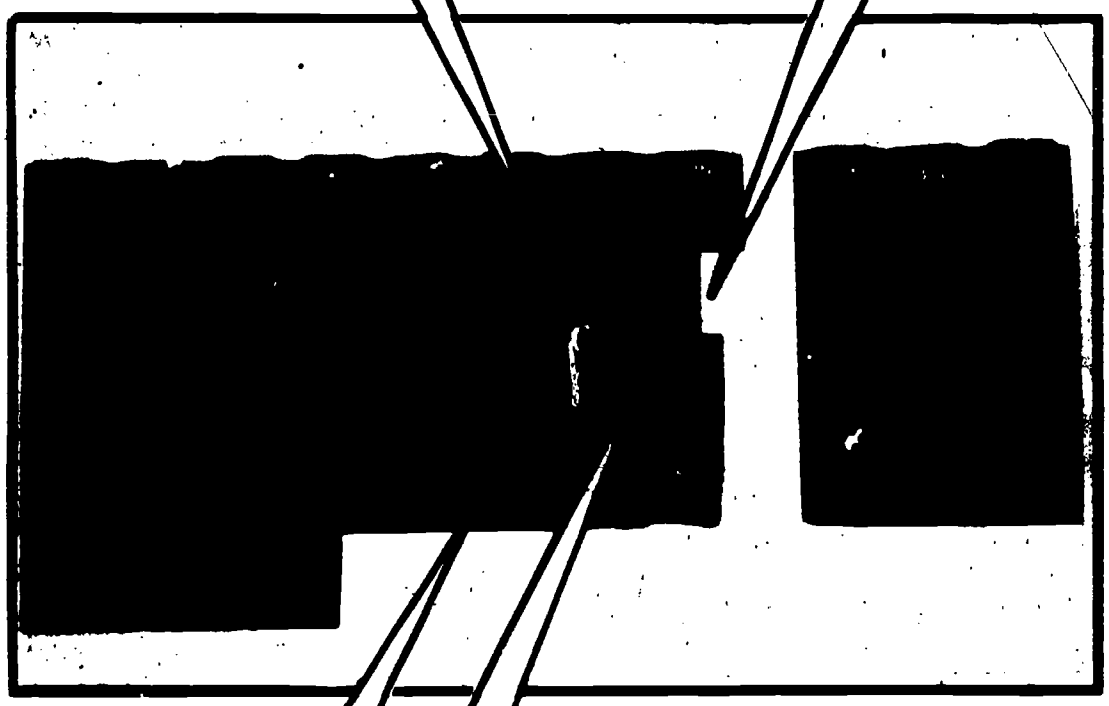
4. Results: The Text Menu will appear on the screen.

SEGMENT II: CREATING/EDITING FILES

CORRECTION/EDIT FEATURES

1. Use the CRSR Key or the SHIFT/CRSR Keys to move the cursor in the directions of the arrow without erasing.

2. Use the INST/DEL Key to back-up the cursor and erase each space as it passes.



3. Use the SHIFT/INST/DEL key to open the space on which the cursor rests.

4. You can make corrections on Labels, Headers or Footers at the time of their initial entry or later by recalling them.

SEGMENT II: CREATING/EDITING FILES

LABELS AND UNDERLINES

LABEL 1

Note: The Paraphrase Page is a duplicate of the Information Page with the key words blanked out. The purpose of the Paraphrase Page is to provide readers a self-check on how well they remember the material presented on the Information Page.

1. If you wish to underline a key word.

   FIRST, key the up-arrow.
   THEN, key the word.
   THEN, key the up-arrow.

2. When Paraphrase Pages are printed All underlined words are blanked out.

LABEL 1

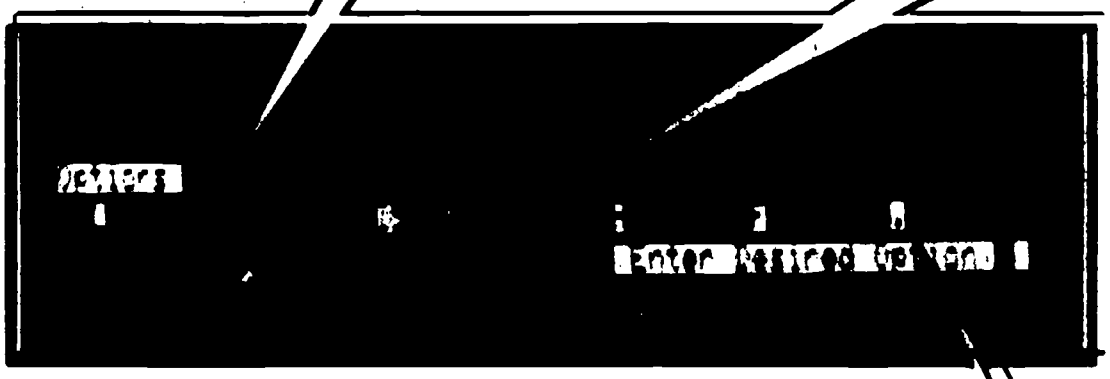
Note: The _____ _____ is a duplicate of the _____ _____with the key words _____ ____. The purpose of the _____ _____ is to provide readers a self-check on how well they remember the material presented on the _____ _____.

SEGMENT II: CREATING/EDITING FILES

LABELS

1. After completing Label 1 you may key in 'L' to begin Label 2.

2. If you want to delete a label, key in 'D' and the number of the label to be deleted.



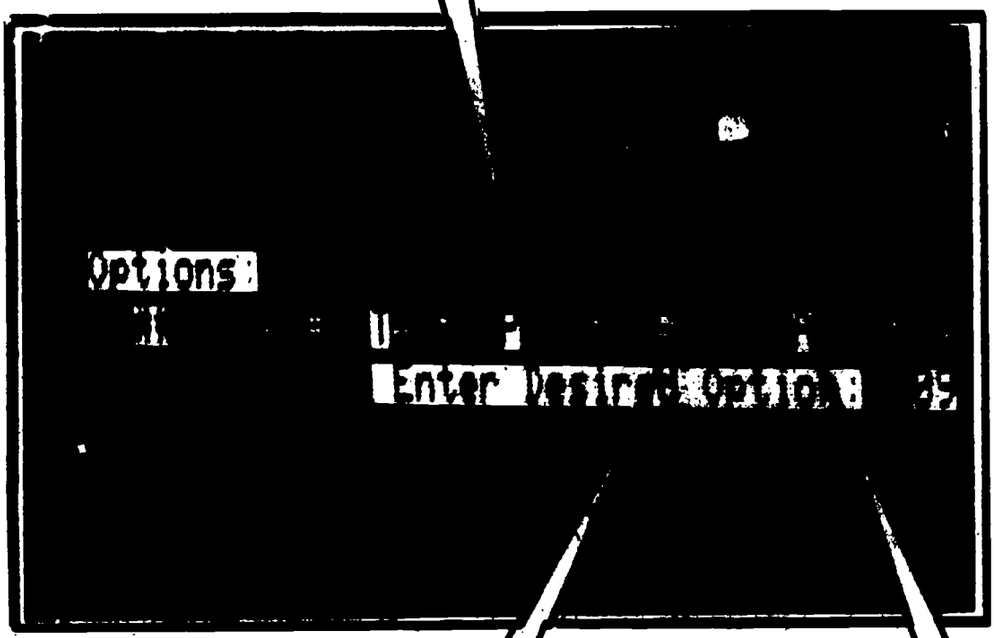
Note: If you wish to change the text of a label, enter that label's number and edit the text. If you need or want to change the size of a label, you must first delete the label and then entirely enter that label.

3. Key in '.' when the text entry is completed and you wish to return to the Input/Edit Page Data Menu.

SEGMENT II: CREATING/EDITING FILES

INPUT/EDIT PAGE DATA

1. Option 'P' provides a hard copy of the Input/Edit Page Data, Header, Footer and Labels.



2. Option 'S' stores the Input/Edit Page Data and Text Data in the permanent MicroPLA File.

3. WARNING: Option 'A' returns you to the User Page Listing Menu without saving data entries or changes made during this session. Previously entered data is undisturbed.

   Note: Abort confirmation will be required

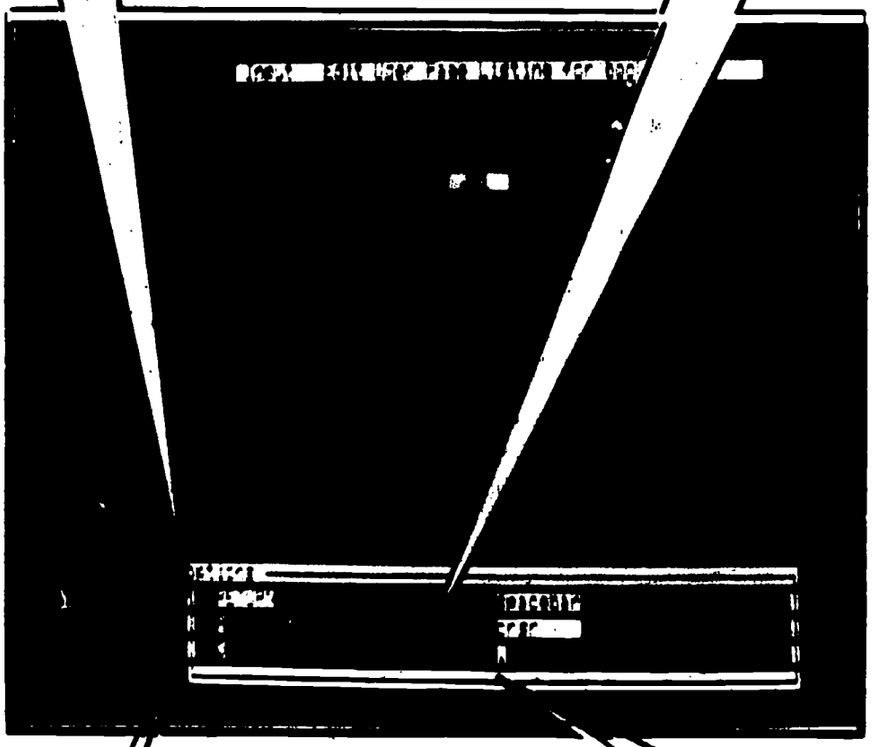
4. For the purpose of this exercise key 'S' and continue.

SEGMENT II: CREATING/EDITING FILES

INPUT/EDIT DATA - USER PAGE LISTING

1. Option 'RETURN' will recall the page listed adjacent to the cursor. Key SPACEBAR or CRSR to move the cursor.

2. Option 'A' will initiate the process of creating a new page file.



3. Option 'D' will delete the page file adjacent to the cursor.

4. Option '.' will return you to the Book Listing for the Project you are working on.

Note: To return to the Master Menu key ESC.

Note: Before deleting the page file, the computer will ask ARE YOU SURE? Keying in 'Y' will delete the file while any other key will retain the file.

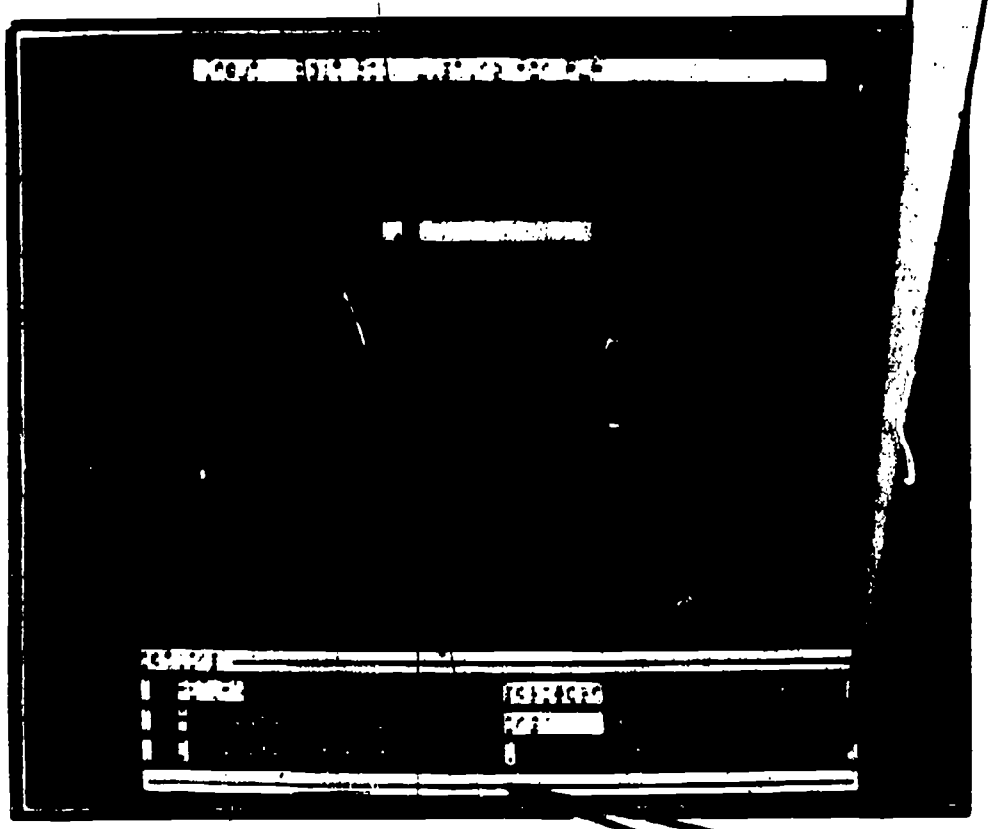
5. For the purpose of this exercise key in '.' and continue.

SEGMENT 11: CREATING/EDITING FILES

INPUT/EDIT DATA - BOOK FILE

1. The menu options for the Book Listing function the same as the Page Listing options. The options allow you to edit, add or delete a book.

2. Option '.' will return you to the Project File Listing.



Note: To return to the Master Menu, Key ESC.

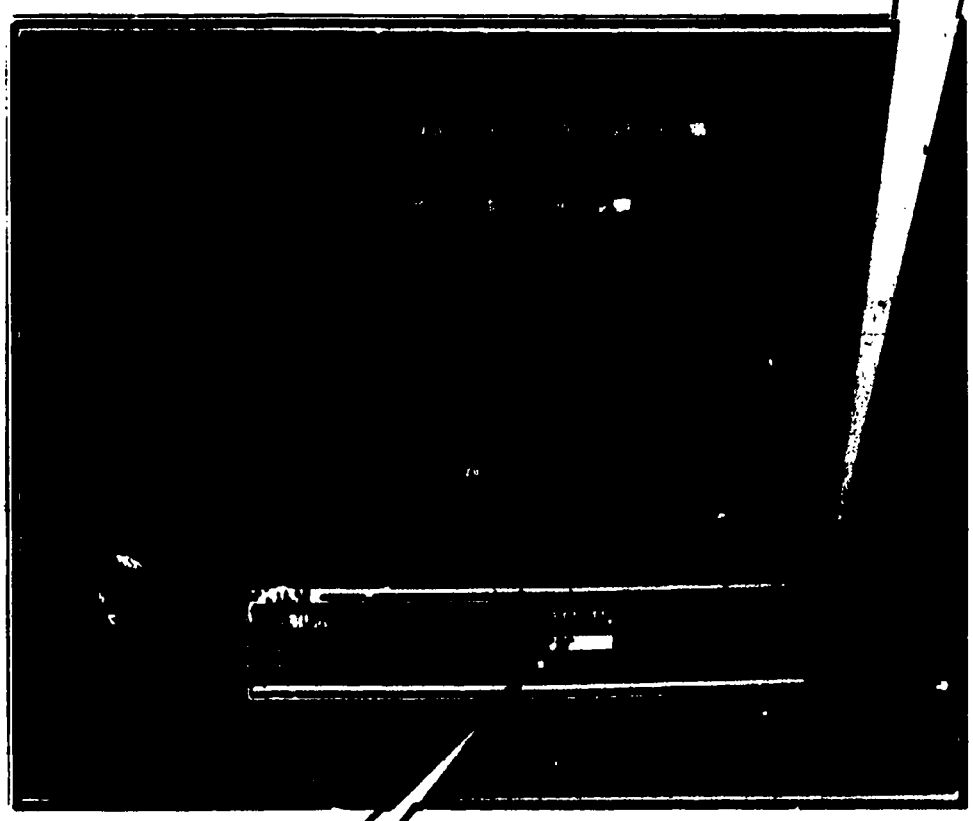
3. For the purpose of this exercise key in '.' and continue.

SEGMENT II: CREATING/EDITING FILES

INPUT/EDIT DATA - PROJECT FILE

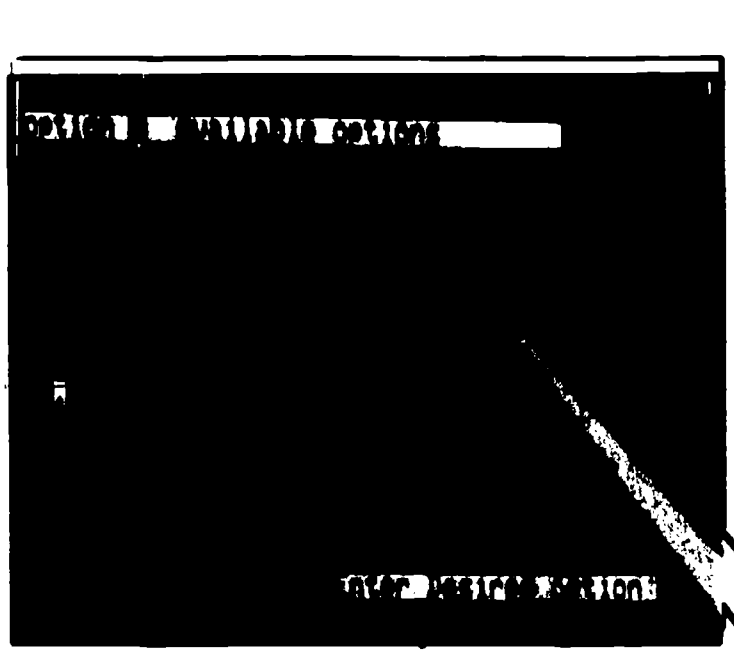
1. The Menu options for the Project File Listing function the same as the Book and Page Listing options. The options permit you to edit, add, or delete a Project.

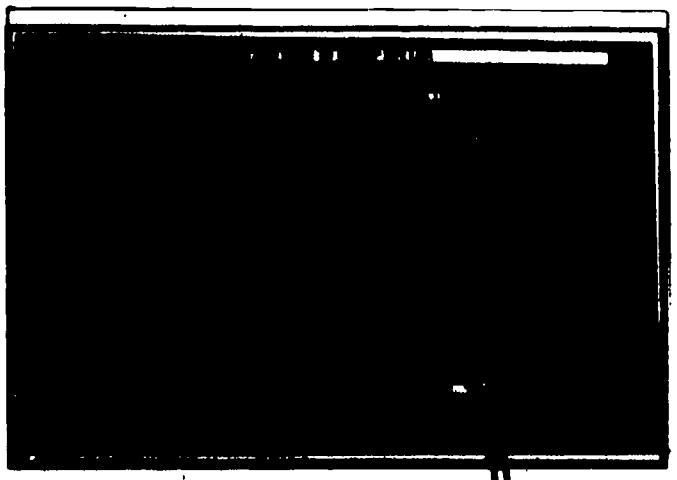
2. Option '.' or ESC will return you to the Main Menu.

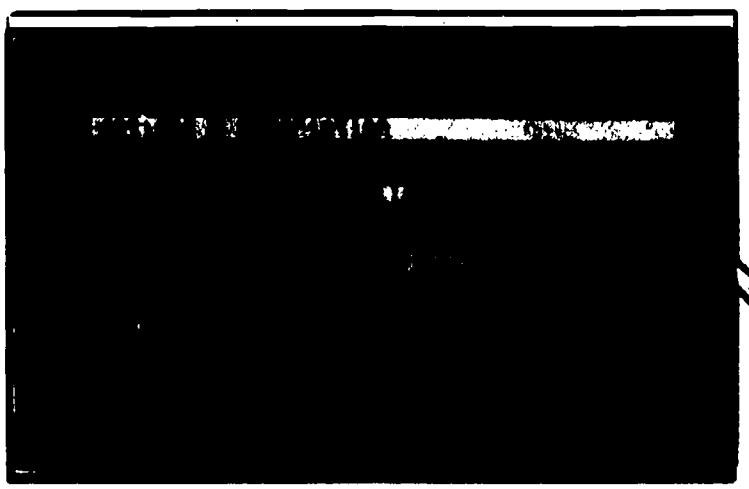


3. For the purpose of this exercise, key in '.' and continue.

SEGMENT III: PAGE LAYOUT GENERATION







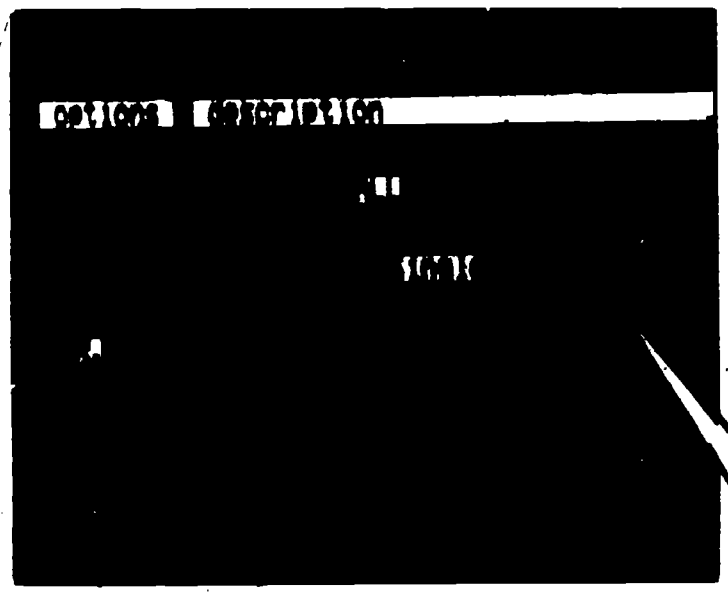
1. Key in '2' to access the Generate Layout option.

   Note: The Generate Layout option actually generates page layouts using the data entered into the Input/Edit layout data file.

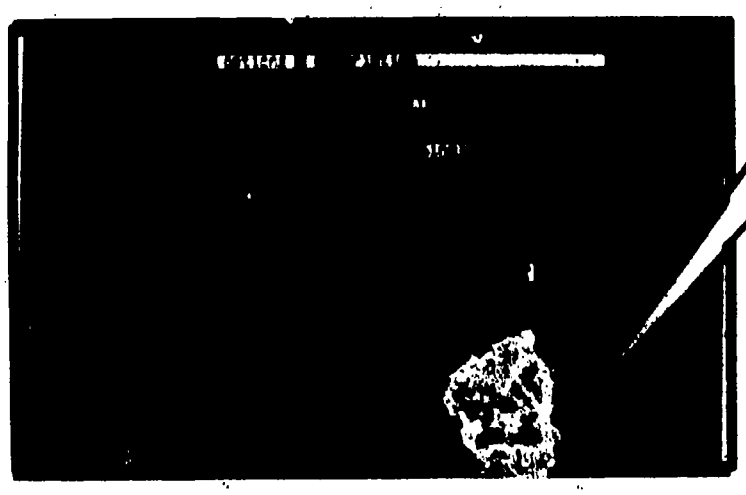
2. Option '1' will generate all the pages of a book.

3. If you selected option '1' you would key in the Project Name, Book Name and Print Status when requested to do so.

SEGMENT III: PAGE LAYOUT GENERATION



1. For the purpose of this exercise, key in '2' to generate a single page.

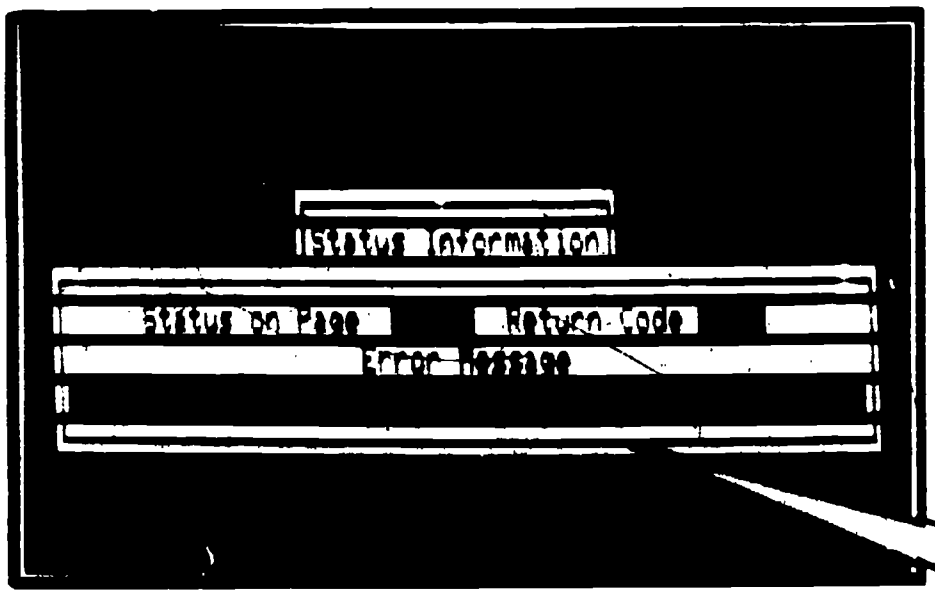


2. Key in the Project Name, Page Number and Print Status when requested to do so.

Note: Be certain to specify each exactly as it was initially written, including spacing and capitalization.

SEGMENT III: PAGE LAYOUT GENERATION

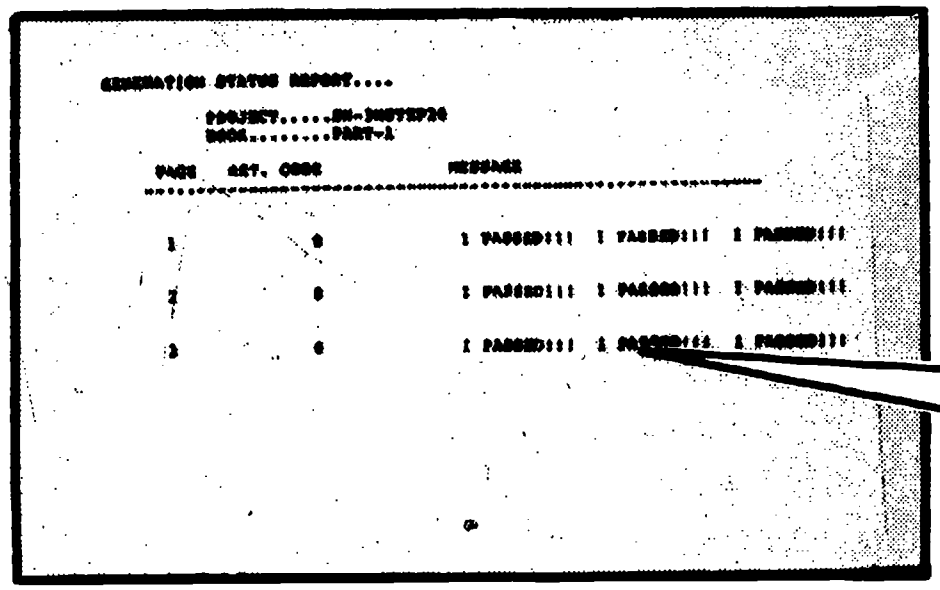
MESSAGES



1. Fatal Error Messages indicate why a page cannot be generated. A complete list of ERROR Messages is provided in appendix C.

2. All messages will be displayed in the status information box for each page generation.

   Note: When a page generation is successful, the words, I Passed, are displayed.

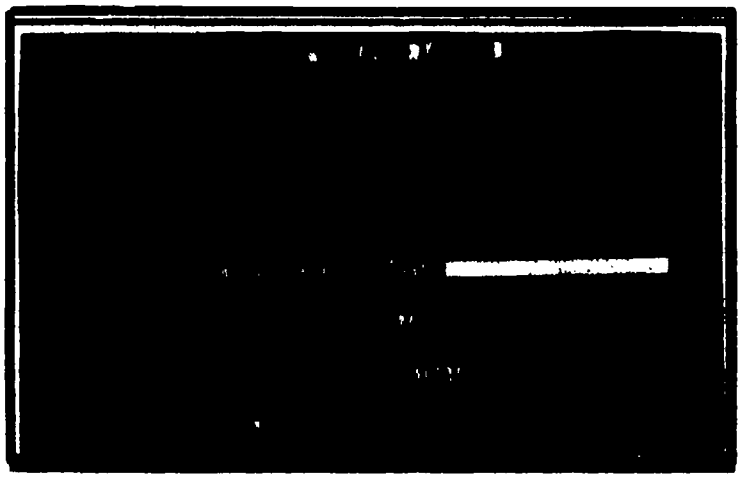


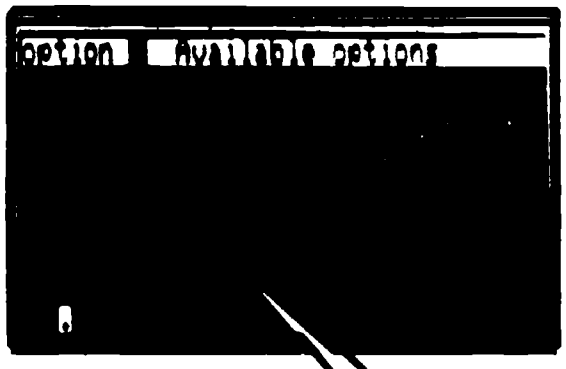
3. The Status Information will also be provided on a printout.

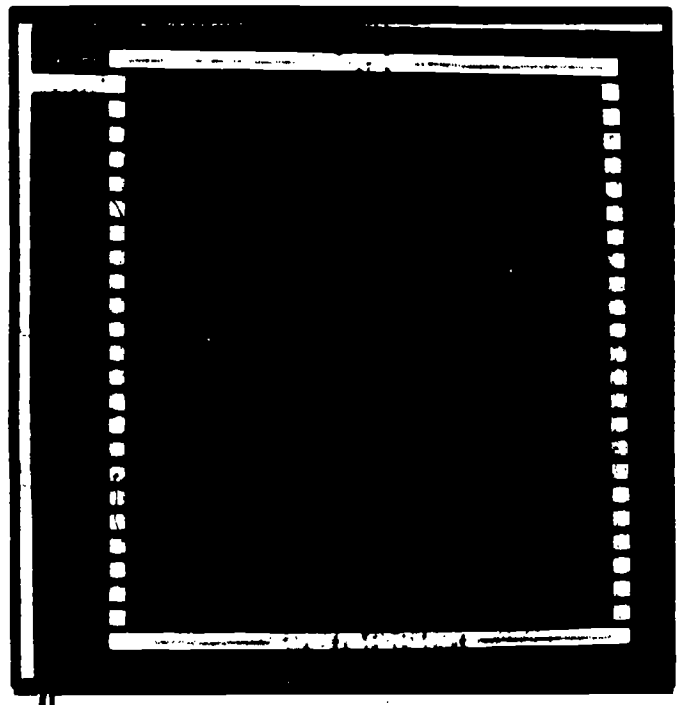
4. When the generation of all pages requested is complete, the Generation Menu will return to the screen.

   For the purpose of this exercise, key in '.' to return to the master menu.

SEGMENT IV: DISPLAY PAGE LAYOUT







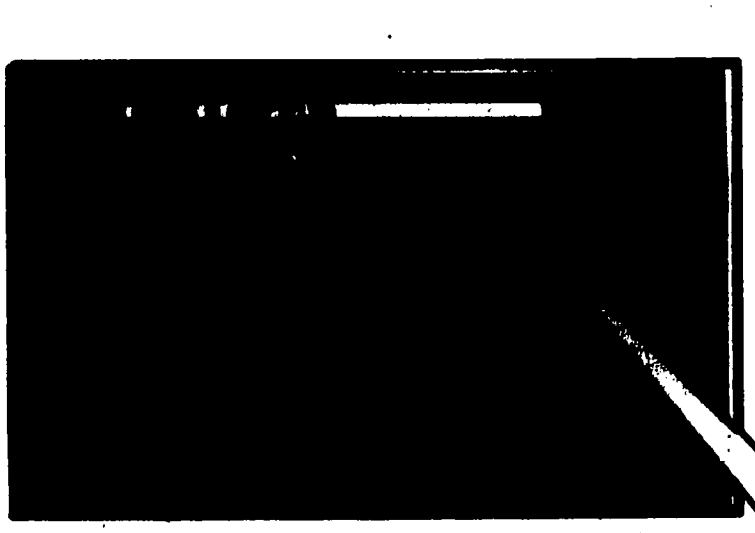
Note: Overlapping lines do not necessarily denote a bad layout.

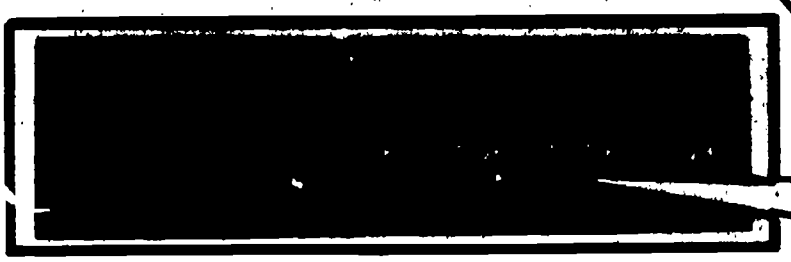
2. The screen will display an approximate view of the layout.

Note: The purpose of the Display option is to provide the user a quick way to examine the Displays without printing them.

1. Key in '3' to list the Display Layout Menu.

SEGMENT IV: DISPLAY PAGE LAYOUT





1. Option '1' will display an entire book.

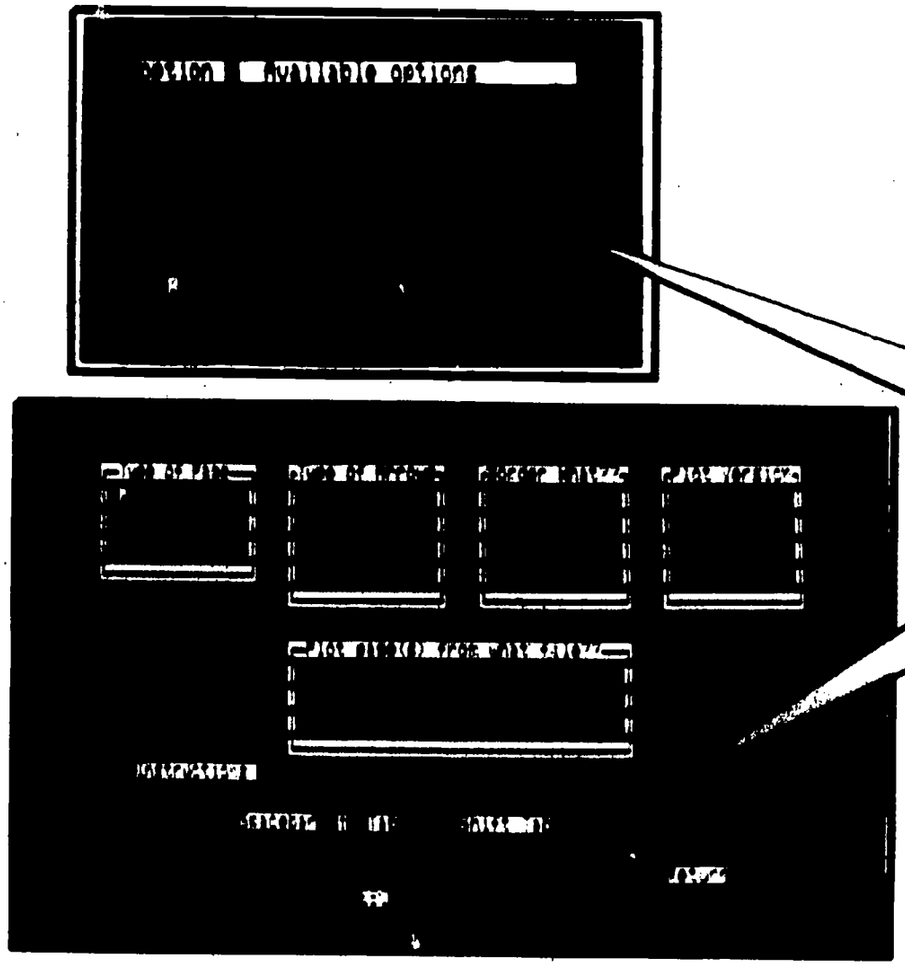
2. Key in Project Name and Book Name when requested to do so.

3. For the purpose of this exercise, key in '2' to display a single page.

   Key in Project Name, Book Name and Page number when requested to do so.

4. After viewing, press any key to return to the Display Choice Menu. Key in '.' to return to the Master Menu.

SEGMENT V: PRINT/PLOT PAGE LAYOUTS



1. Key in '4' to list the Print Choise Menu.

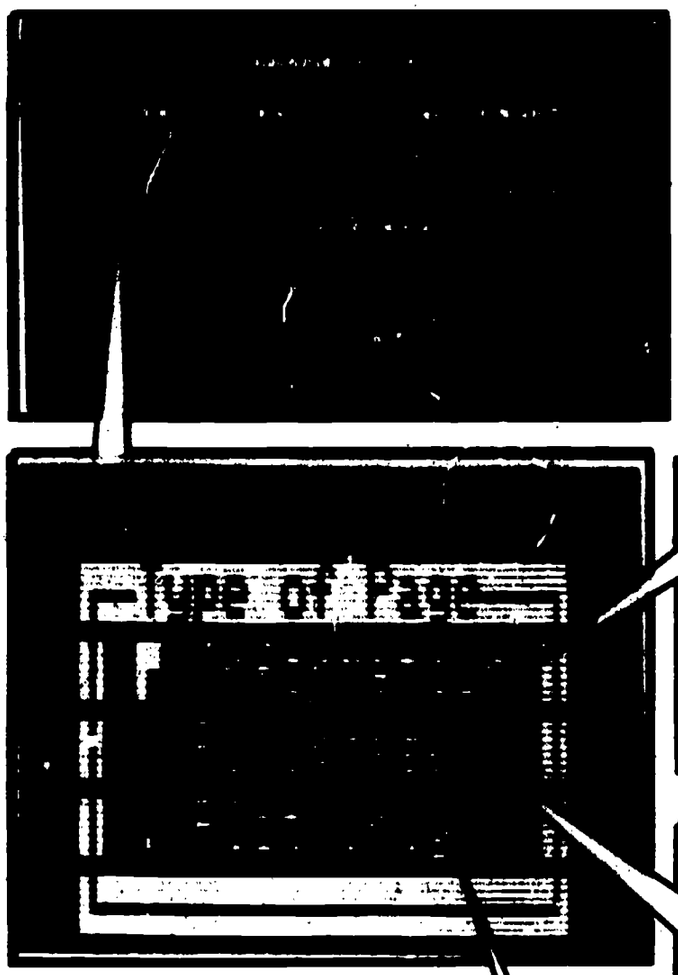
2. Use the SPACEBAR, ↑, TAB and SHIFT/TAB keys to select options and files.

Note: The TAB and SHIFT/TAB will move the cursor back and forth to the different options. The ↑ key and SPACEBAR move the cursor up and down within each option.

3. Each option has a default choice which is where the cursor originates in each option. If this is the selected choice, only tab to the next field.

SEGMENT V: PRINT/PLOT PAGE LAYOUTS

INFORMATION/PARAPHRASE PLOT PAGES



1. The First option prints out Information Pages.

   Note: The Information Page is the basic instructional page in a Procedure Training Aid. The pages in this handbook are information pages.

2. The second option prints out Paraphrase Pages.

   Note: The Paraphrase Page is a duplicate of the Information Page with key words blanked out. The purpose of the Paraphrase Page is to provide readers a self-check on how well they remember the material presented on the Information Page.

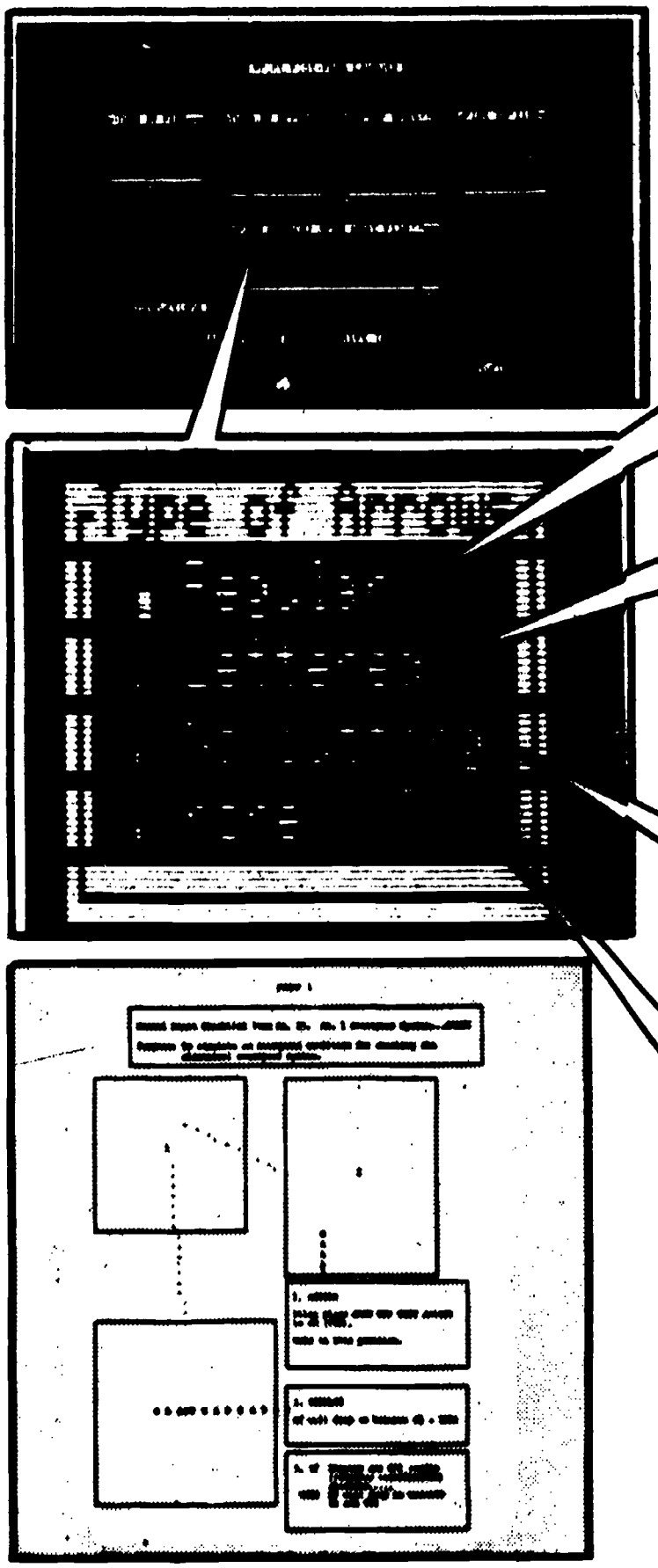
3. The third option prints out a plot of the layout.

   Note: The Plot Only feature prints out the page with no text information.

4. For the purpose of this exercise, Tab to the next field.

SEGMENT V: PRINT/PLOT PAGE LAYOUTS

ARROW CHOICES



1. The first option provides a print out with all Arrows including those that cut labels and pictures.

2. The second option provides label arrows printed in letters instead of dots.

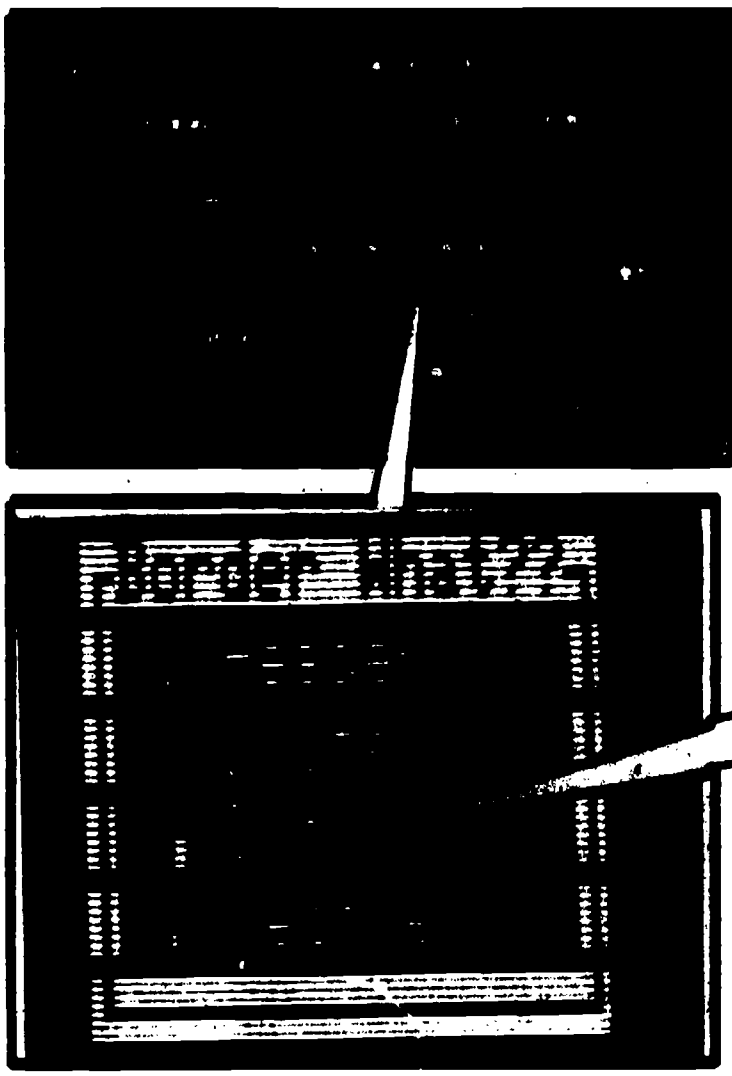
3. The third option provides a print out which eliminates arrows that cut pictures or labels . This is generally used as the final print out. The eliminated arrows are placed by hand.

4. The fourth option provides a print out which eliminates all arrows.

   For the purpose of this exercise, Tab to the next field.

SEGMENT V: PRINT/PLOT LAYOUTS

HEADER/FOOTER BORDER PRINTOUTS

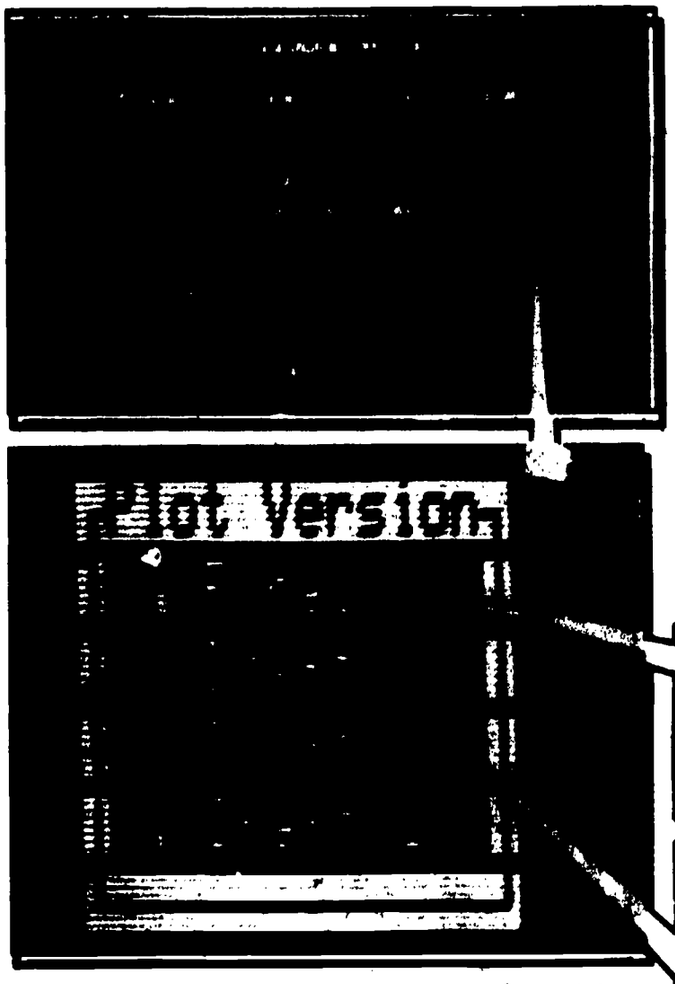


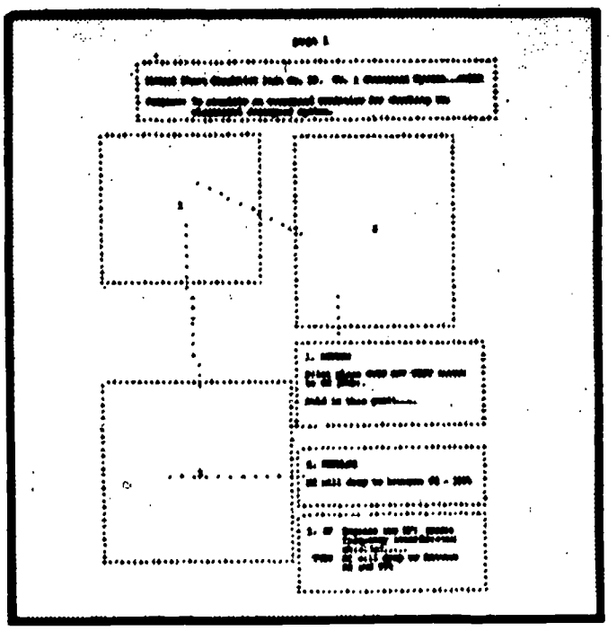
1. For the purpose of this exercise, key the third option which indicates that both Header and Footer should be printed.

Note: The advantage in opting not to use a border is in the time saved in printing.

SEGMENT V: PRINT/PLOT PAGE LAYOUTS

PLOT SPEED CONTROL





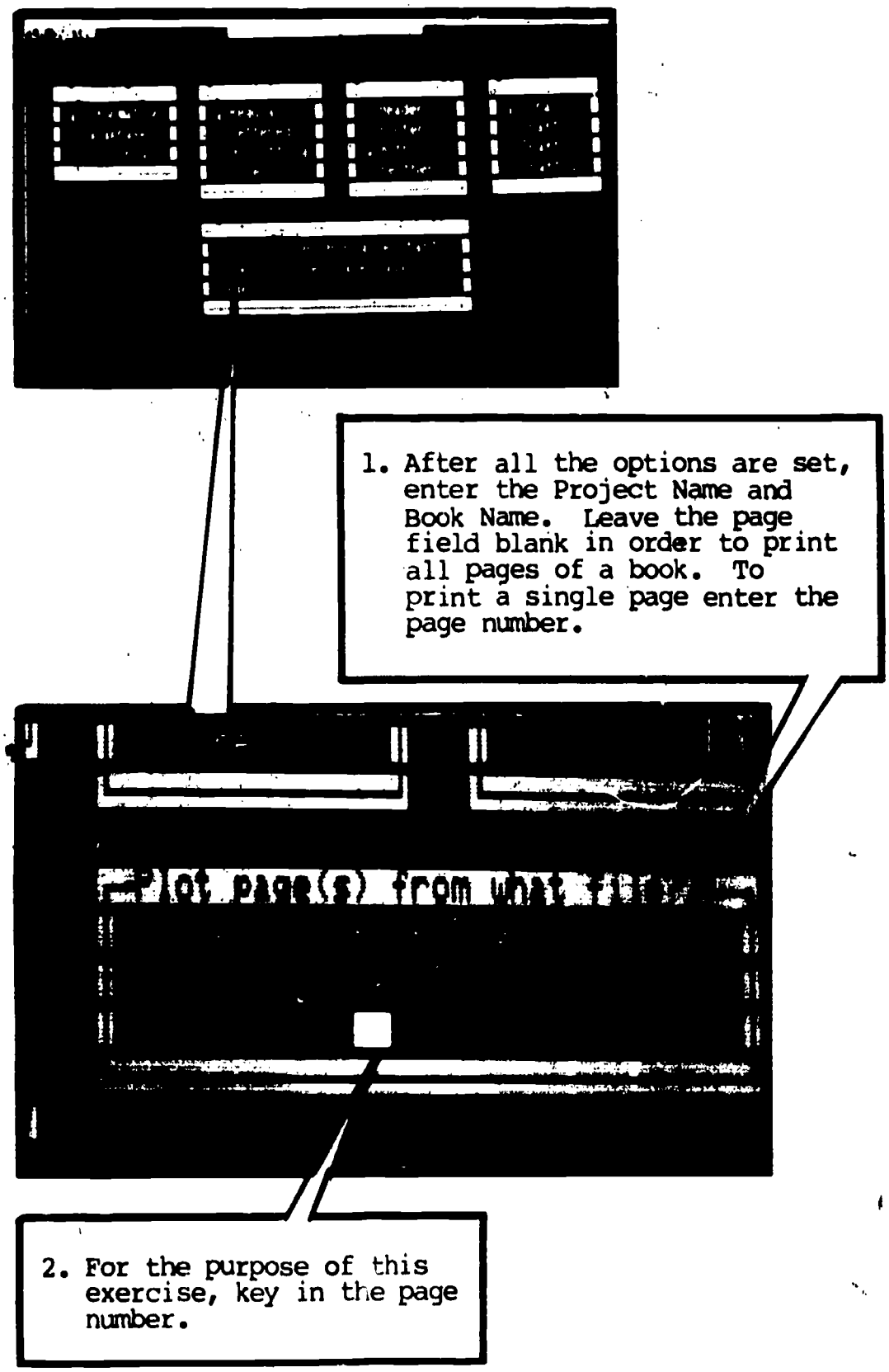
1. Final Draft provides a solid line suitable for camera ready copy (e.g., this page).

2. Slow, Medium and Fast Drafts (Drafts 3,2,1) produce dotted lines. The faster the speed, the greater the space between dots.

Note: The purpose of medium and fast speeds is to produce a quick, hard copy for examination during development of the page layout.

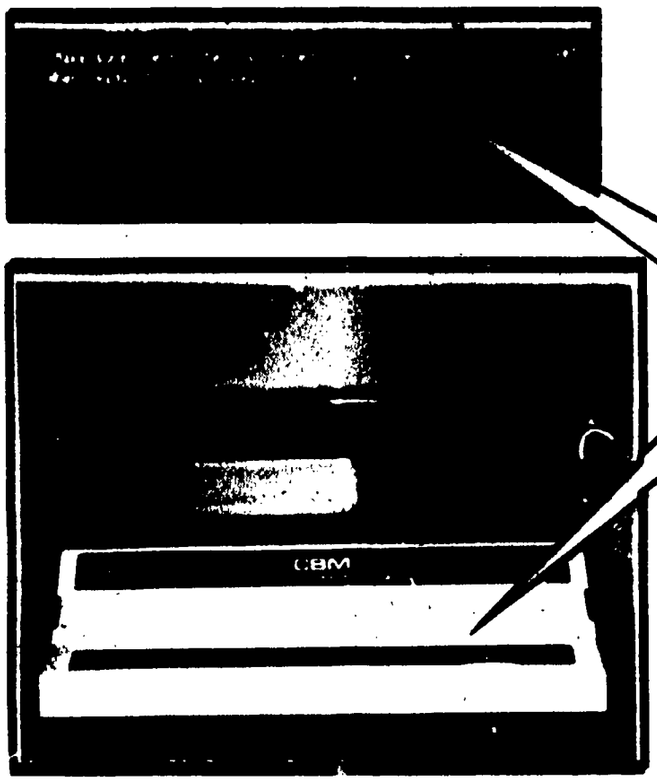
3. For the purpose of this exercise, tab to the File Field.

SEGMENT V: PRINT/PLOT PAGE LAYOUTS



SEGMENT V: PRINT/PLOT PAGE LAYOUT

PRINTER



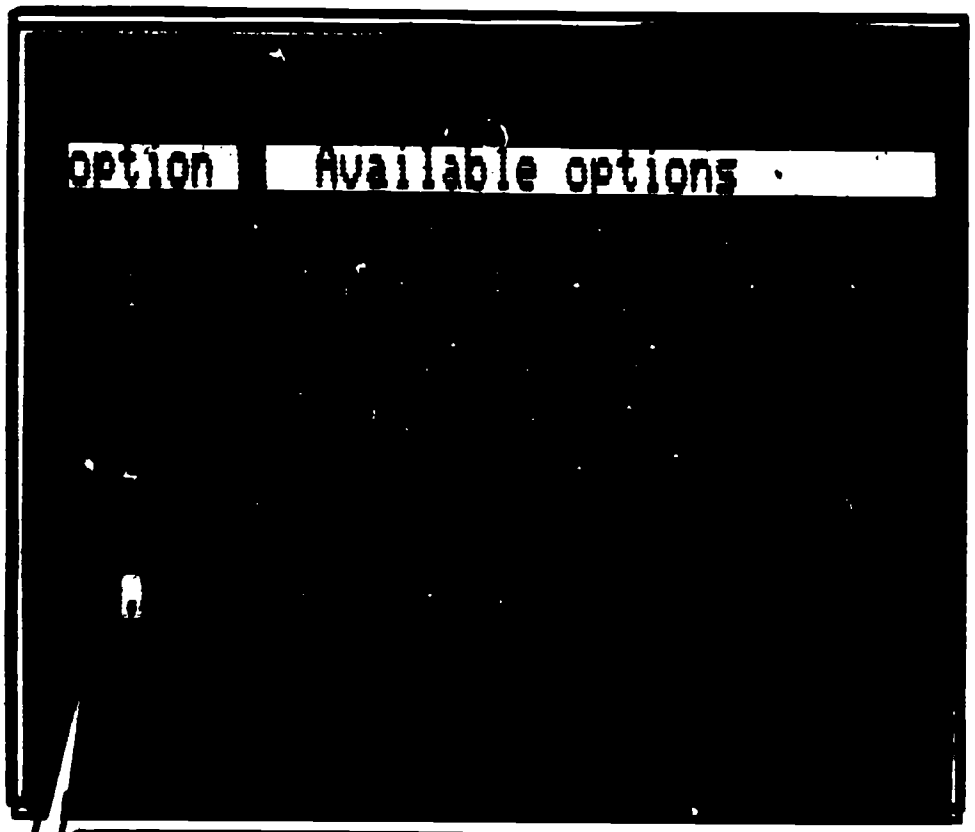
1. This statement will appear on the screen when the program is ready to print.

2. Make certain the printer is on and ready to print.

3. The pages being plotted will appear in the lower portion of the screen. If you wish to interrupt plotting at any time, touch any key and create the appropriate response.

4. When the plotting is complete print plot screen will be displayed. For the purpose of this exercise, key ESC to return to the Master Menu after printing.

SEGMENT VI: END OF SESSION



1. Key in any of the options to continue in MicroPLA.

2. Key in '.' if you wish to end the session.

3. The END OF SESSION message will appear indicating proper closure of the files and exit from the program.

REFERENCES

Braby, R., Brown, C. J., and Smode, A. F. Handbook of Format Models for Designers of Technical Training Materials (TAEG Technical Report No. 129). Orlando: Training Analysis and Evaluation Group, August 1982.

Folley, J. D., Joyce, P. R., Mallory, W. J., and Thomas, D. L. Fully Proceduralized Job Performance Aids (AFHRL TR 71-53, Vol. I and II). Brooks AFB, Texas: Air Force Human Resources Laboratory, December 1971.

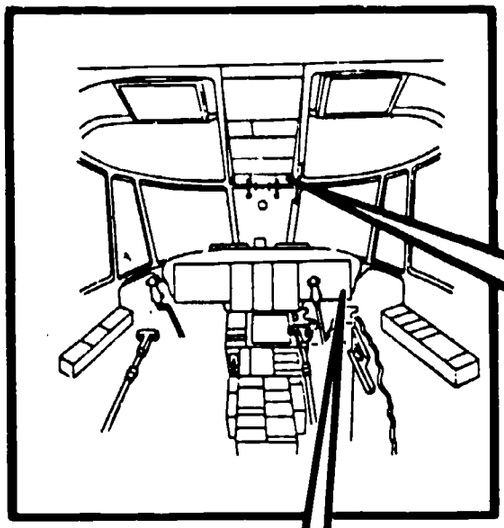
Terrell, W. Computer Automated Page Layout (PLA) for Text-Graphic Materials: User's Guide (TAEG Technical Report No. 137). Orlando: Training Analysis and Evaluation Group, December 1982.

APPENDIX A

SAMPLE PAGES OF INSTRUCTIONAL MATERIALS AND INPUT DATA

Normal Start Checklist Item No. 28. No. 1 Overspeed System...CHECK

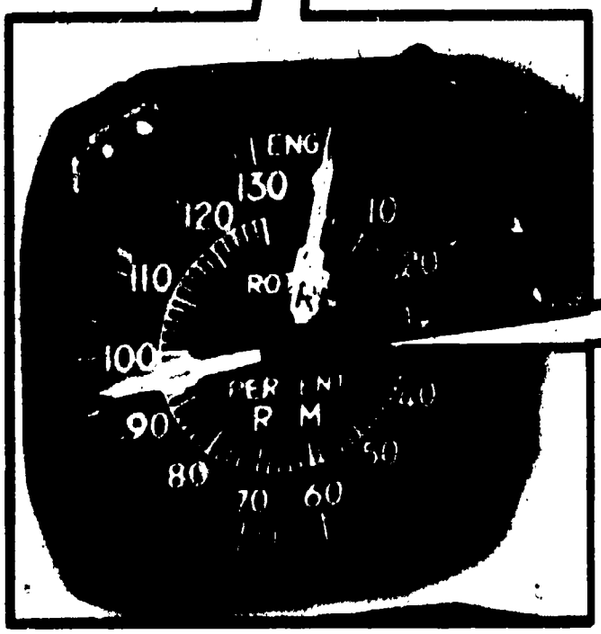
Purpose: To simulate an overspeed condition for checking the electrical overspeed system.



1. ACTION

Pilot place OVSP GOV TEST switch to ON (FWD).

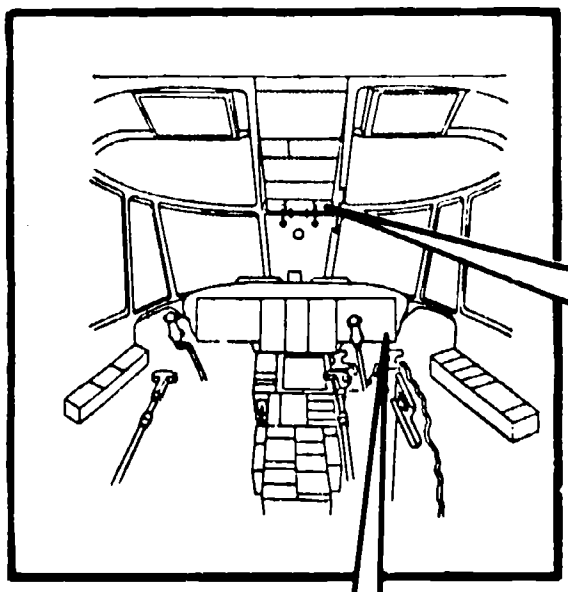
Hold in this position.



2. RESULTS

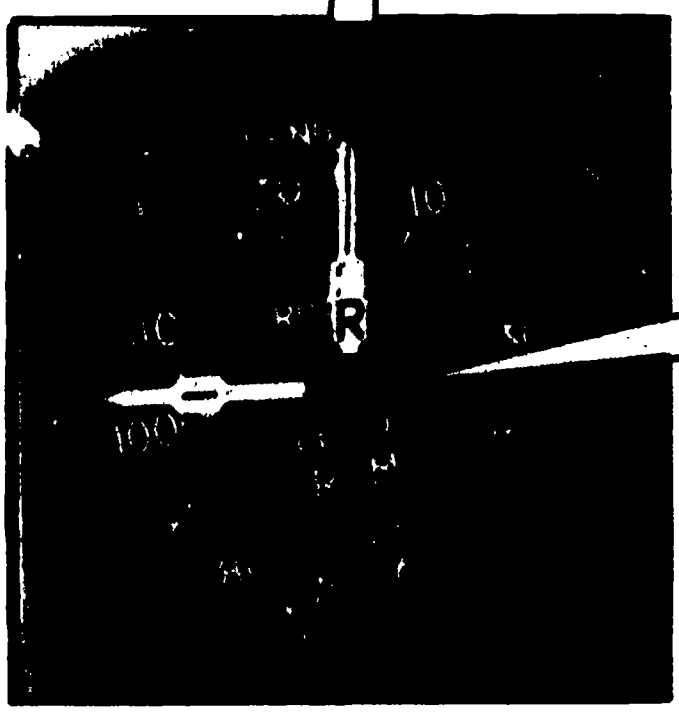
Nf will drop to between 95 - 100%

3. IF Engines are RFI (radio frequency interference) shielded.....
THEN Nf will drop to between 88 and 99%



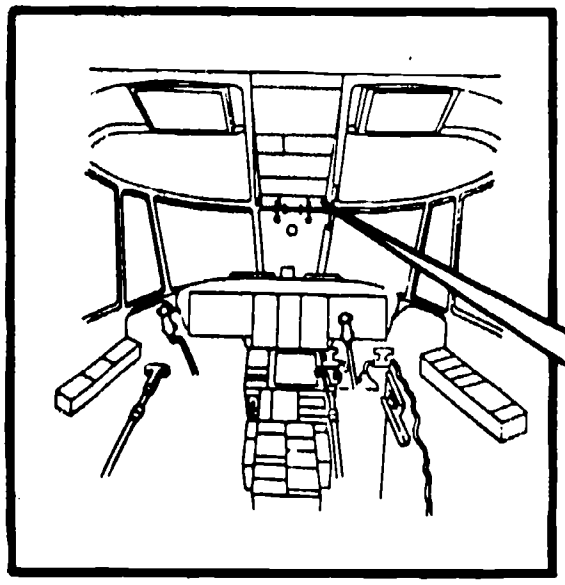
4. ACTION

Pilot place OVSP GOV OVRD switch to ON (FWD)



5. RESULT

Nf should return to 104%



8. VOICE RESPONSE

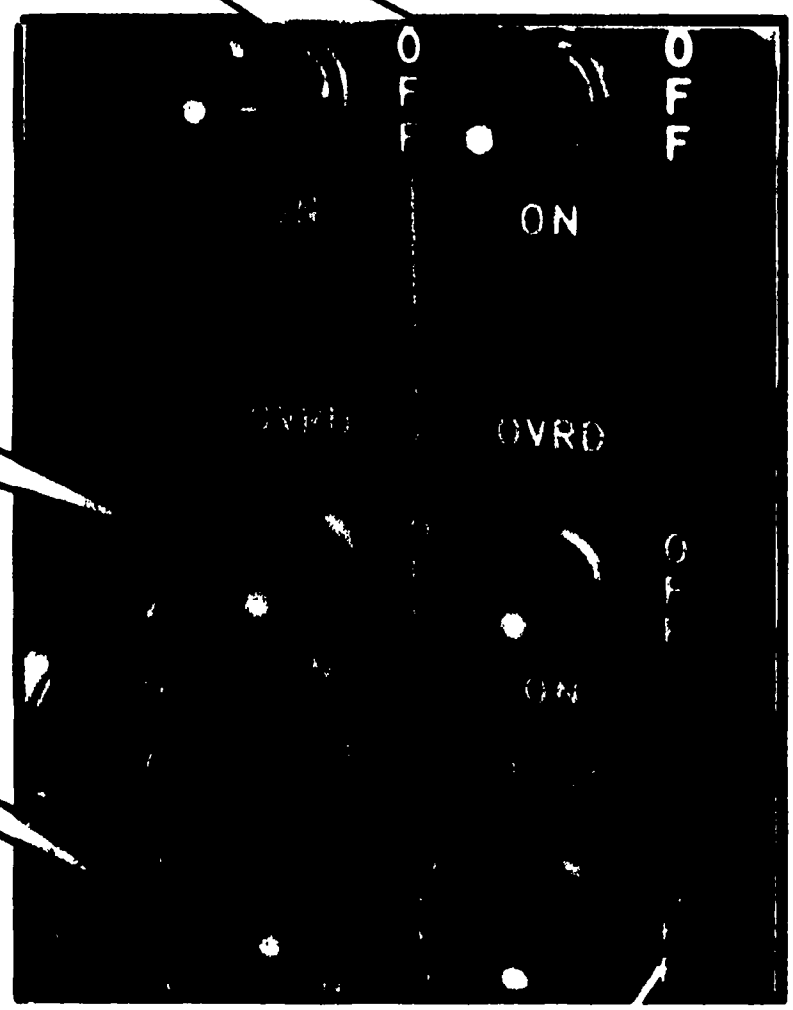
'CHECK'

7. ACTION

Pilot place OVSP GOV OVRD switch to OFF (AFT)

6. ACTION

Release OVSP GOV TEST switch (spring loaded to OFF)



GO TO PAPER MOCK-UP: Talk your way through the step.
Touch where each action and response takes place.

PLA: INPUT/EDIT PAGE DATA

PROJECT MANGER...BRABY
PROJECT NAME.....SH-3HSTEP28
BOOK NAME.....PART-1
PAGE NAME.....1
UNIT OF MEASUREMENT IS IN...INCHES

PICTURE DIM'S

	HEIGHT	WIDTH
OVERVIEW -> 1	02.50	02.50
2	03.24	02.50
3	03.00	03.00

PIC AND LABEL RELATIONSHIPS

PIC. TO	PIC. FROM	LAB. FROM	COORDINATES X	COORDINATES Y
1	2	0	01.24	00.62
1	3	0	01.24	01.24
2	0	1	00.62	02.43
3	0	2	00.74	01.50
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00

HEADER

```
NORMAL START CHECKLIST ITEM NO. 28.  NO. 1 OVERSPEED SYSTEM...CHECK

PURPOSE: TO SIMULATE AN OVERSPEED CONDITION FOR CHECKING THE
         ELECTRICAL OVERSPEED SYSTEM.
```

FOOTER

```
@
```

PLA: INPUT/EDIT PAGE DATA

PROJECT NAME.....SH-3HSTEP28
BOOK NAME.....PART-1
PAGE NAME.....1

LABEL 1

```
!                                    !
! 1. ACTION                          !
!                                    !
! PILOT PLACE OVSP GOV TEST SWITCH   !
! TO ON (FWD).                       !
!                                    !
! HOLD IN THIS POSITION.             !
!                                    !
!                                    !
```

LABEL 2

```
!                                    !
! 2. RESULTS                         !
!                                    !
! NF WILL DROP TO BETWEEN 95 - 100%  !
!                                    !
!                                    !
```

LABEL 3

```
!                                    !
! 3. IF  ENGINES ARE RFI (RADIO      !
!        FREQUENCY INTERFERENCE)     !
!        SHIELDED.....               !
!  THEN  NF WILL DROP TO BETWEEN     !
!        88 AND 99%                  !
!                                    !
!                                    !
```

PLA: INPUT/EDIT PAGE DATA

PROJECT MANGER...BRABY
PROJECT NAME.....SH-3HSTEP28
BOOK NAME.....PART-1
PAGE NAME.....2
UNIT OF MEASUREMENT IS IN...INCHES

PICTURE DIM'S

		HEIGHT	WIDTH
OVERVIEW ->	1	02.50	02.50
	2	03.00	03.00
	3	03.00	03.00

PIC AND LABEL RELATIONSHIPS

PIC. TO	PIC. FROM	LAB. FROM	COORDINATES X	COORDINATES Y
1	2	0	01.24	00.62
1	3	0	00.62	01.24
2	0	1	00.74	02.24
3	0	2	00.74	01.50
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00

HEADER

!@

FOOTER

!@

PLA: INPUT/EDIT PAGE DATA

PROJECT NAME.....SH-3HSTEP28
BOOK NAME.....PART-1
PAGE NAME.....2

LABEL 1

```
==========================================
!                                        !
! 4. ACTION                              !
!                                        !
! PILOT PLACE OVSP GOV OVRD SWITCH       !
! TO ON (FWD)                            !
!                                        !
!                                        !
==========================================
```

LABEL 2

```
==========================================
!                                        !
! 5. RESULT                              !
!                                        !
!        NF SHOULD RETURN TO 104%        !
!                                        !
!                                        !
==========================================
```

PLA: INPUT/EDIT PAGE DATA

PROJECT MANGER...BRABY
PROJECT NAME.....SH-3HSTEP28
BOOK NAME.....PART-1
PAGE NAME.....3
UNIT OF MEASUREMENT IS IN...INCHES

PICTURE DIM'S

		HEIGHT	WIDTH
OVERVIEW ->	1	02.50	02.50
	2	04.37	05.50

PIC AND LABEL RELATIONSHIPS

PIC. TO	PIC. FROM	LAB. FROM	COORDINATES X	COORDINATES Y
1	2	0	01.24	00.62
2	0	1	01.74	03.28
2	0	2	01.74	02.18
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00
0	0	0	00.00	00.00

HEADER

FOOTER

GO TO PAPER MOCK-UP: TALK YOUR WAY THROUGH THE STEP.
TOUCH WHERE EACH ACTION AND RESPONSE
TAKES PLACE.

PLA: INPUT/EDIT PAGE DATA

PROJECT NAME.....SH-3HSTEP28
BOOK NAME.....PART-1
PAGE NAME.....3

LABEL 1

```
==========================================
!                                        !
! 6. ACTION                              !
!                                        !
! RELEASE OVSP GOV TEST SWITCH           !
! (SPRING LOADED TO OFF)                 !
!                                        !
!                                        !
==========================================
```

LABEL 2

```
==========================================
!                                        !
! 7. ACTION                              !
!                                        !
! PILOT PLACE OVSP GOV OVRD SWITCH       !
! TO OFF (AFT)                           !
!                                        !
!                                        !
==========================================
```

LABEL 3

```
==========================================
!                                        !
! 8. VOICE RESPONSE                      !
!                                        !
!          'CHECK'                       !
!                                        !
!                                        !
==========================================
```

APPENDIX B

FORMAT MODEL FOR DESIGNING PROCEDURE TRAINING AIDS

(Variations of this format model also appear in NAVEDTRA 110A, and in Braby, Brown, and Smode, 1982.)

FORMAT MODEL
PERFORMING PROCEDURES

A general format for use in designing training materials which present steps of a procedure to be performed from memory.

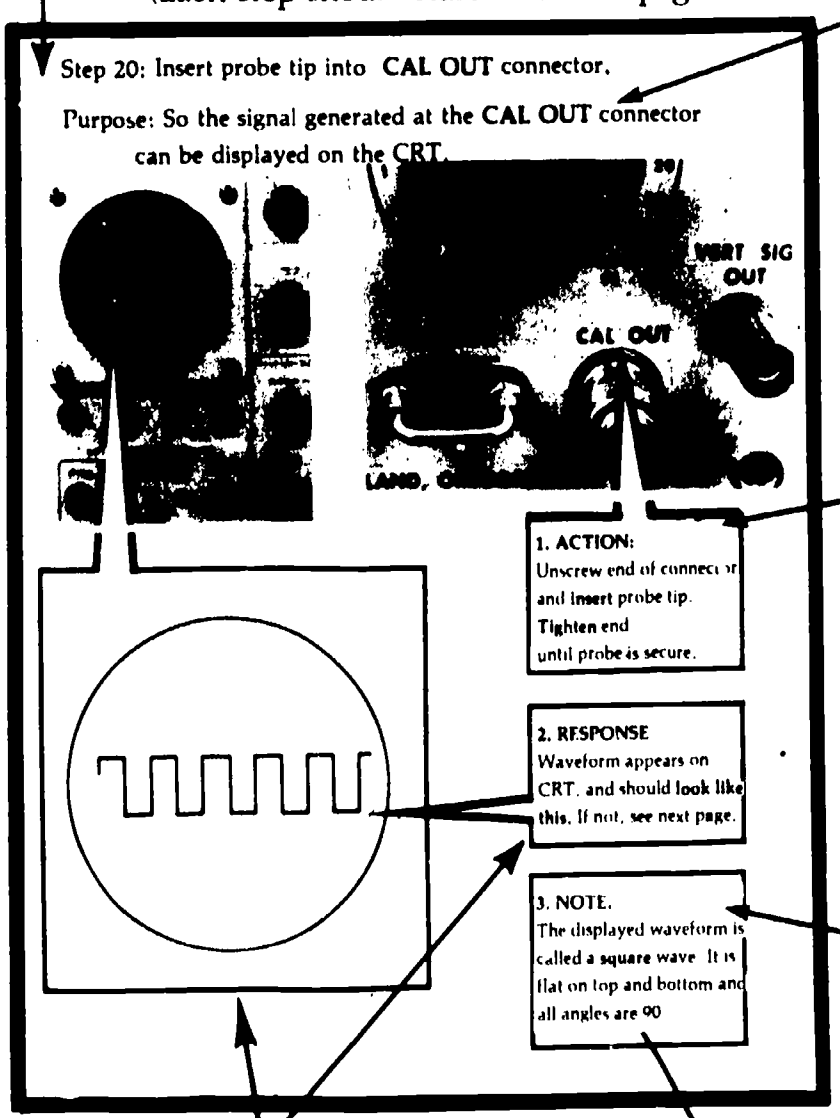
Procedure Format - Page 1

Use this page format to present each step in a procedure.
The purpose of this page format is to present:

- a word description of the step—emphasize human action.
- a visual display of the step—emphasize human action.
- the purpose of the step.
- the location of actions on equipment.
- the system response to actions taken.
- notes--additional needed information.

Break procedure into logical steps.
(Each step should start on a new page.)

Keep purpose short and simple.



Use line drawings or photographs.

If possible, each step should have no more than 3 or 4 actions.

State Action, and Response if there is one, and any Note. Number the boxes in the order you want them read.

Use notes to present additional information that must be recalled and used on the job.

If the system makes a response that should be noted or checked, present the response.

Underline key words.

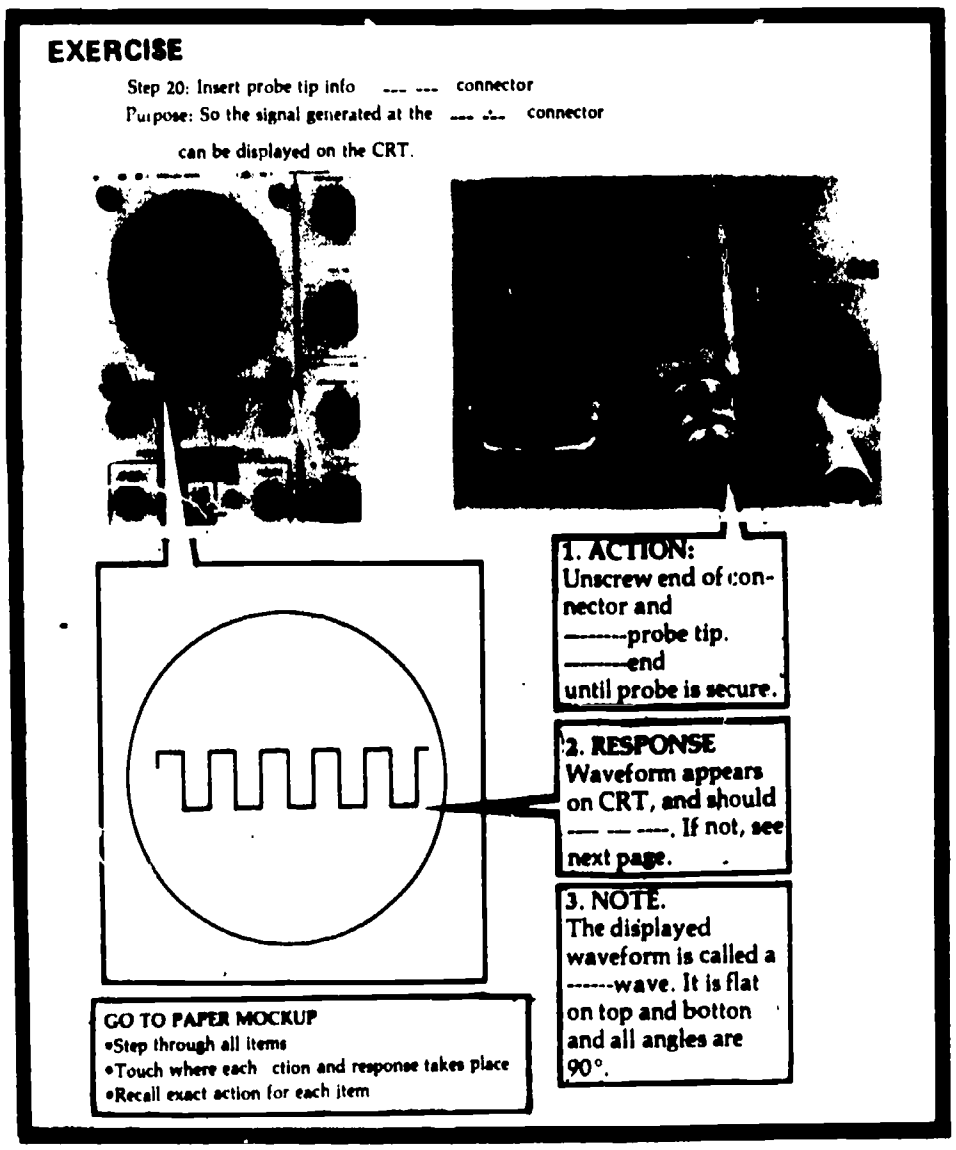
Keep pages simple, with no more than 3 or 4 boxes per page. Use additional pages if necessary.

Performing Procedures Format Model - Page 2

Use this page format immediately following each use of the page 1 format.

The purpose of this page format is to:
- provide students exercise in the recall of key words in the procedure.
- direct the students to practice the step on the paper mock-up.

Copy the previous page. Then drop out key words that were underlined on the previous page.

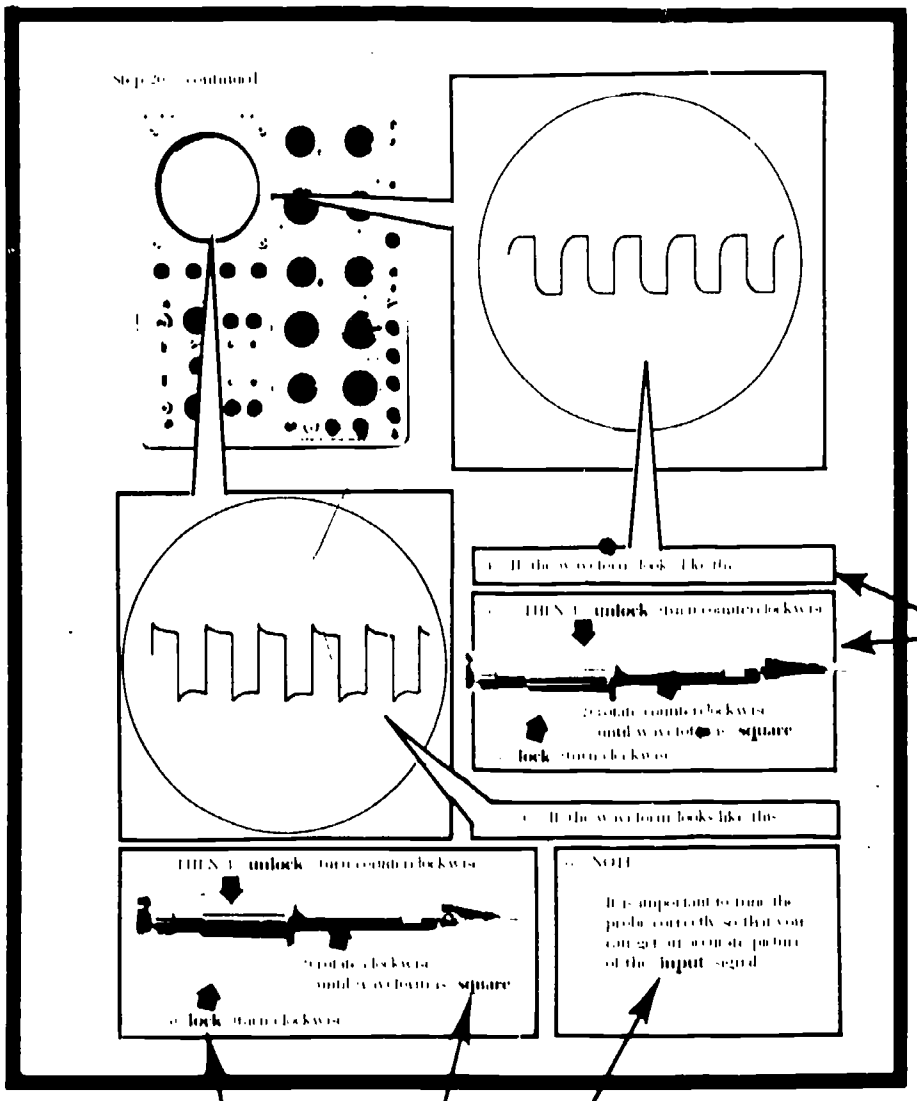


Add directions requiring students to go to the paper mock-up to practice the step.

Performing Procedures Format Model - Page 3

Use this If/Then page to describe simple branches in a procedure.

The purpose of this page format is to:
- describe a special condition that changes the normal procedure.
- describe the action to respond to the special condition.



Performing Procedures Format Model - Page 4

Use this page after presenting each set of 3 to 7 steps in a procedure.

The purpose of this page format is to provide a finger-tracing exercise to aid students in recalling a sequence of steps.

For each cluster of 3 to 7 steps, present a Road Map showing how the steps are chained together.

Road Map

- With your finger, trace the steps
- Recall (1) how to perform, (2) systems response
- Look up answers if you need help
- Keep practicing until you can describe the steps without error or hesitation.

Present last step from previous cluster.

Go To Paper Mockup

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

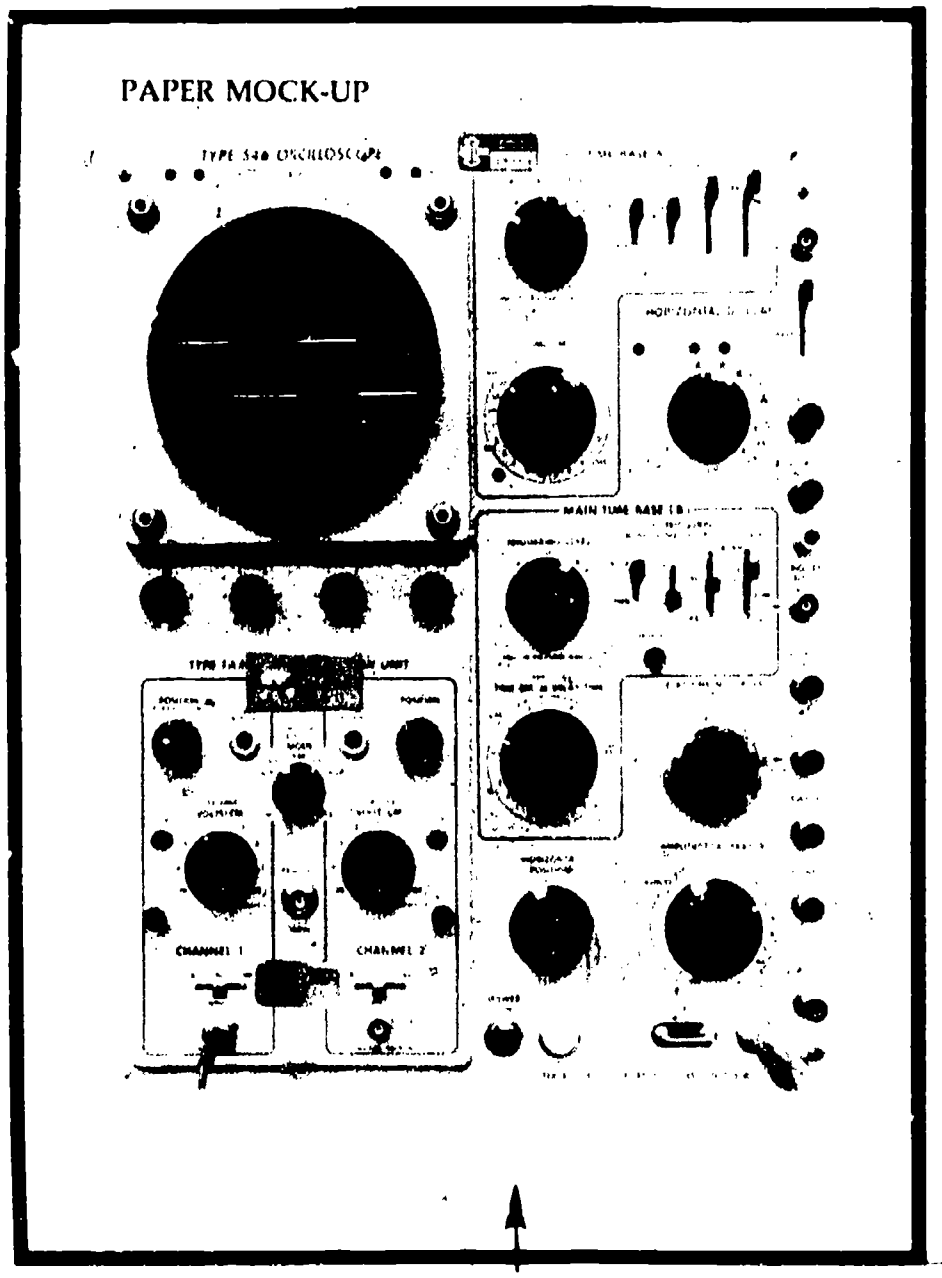
If the procedure is to be performed on the job with a checklist, present the checklist items here.

Performing Procedures Format Mock-up - Page 5

Use this type of page at the end of the learning module.

The purpose of this page format is to provide students with a way to practice one step, a set of steps, or all the steps in a procedure without the use of guides and prompts.

PAPER MOCK-UP



Make sure this page is a foldout that can be used at any time.

If the procedure is to be performed on the job with a checklist, present the entire checklist here, or on the opposite page where it can be easily seen while viewing this page.

APPENDIX C

MICROPLA SYSTEM ERROR MESSAGES

SYSTEM ERROR MESSAGES

The occurrence of a Fatal Error Message indicates that a specific page could not be generated for the reason stated in the message. The MicroPLA system was unable to generate a page layout using the data entered in the Input/Edit Page Data for the specific page. After exhausing the repertoire of solutions for that problem, MicroPLA has aborted the process and has provided a Fatal Error Message explaining the reason for terminating the process.

MICROPLA SYSTEM ERROR MESSAGES

Return Code	
1	No Pictures Present in the Data
2	Label(s) is too Wide
3	Illegal Layout, More Than 1 Label to a Pic
4	Main Overview Pic Referenced Illegally
5	Main Overview Pic Referenced by a Label
6	A Label is Missing in the Sequence
7	Illegal Picture to Label Relationship
8	Illegal Picture to Picture Relationship
9	More Than 1 Picture to a Label
10	More Than 1 Overview to a Close-Up Picture
11	Picture Dimensions Insufficient for Generation
12	Internal Coordinates Outside of Pic's Dims
13	A Reference is Made to a Non-Existing Label
14	Label(s) is too Long

ERROR TROUBLE SHOOTING

If a Fatal Error occurs, the page will have to be changed in order for it to be generated. The Fatal Error Messages provide guidance to enable the author to correct the Input/Edit Page Data for that page. Practice and experience with MicroPLA facilitates correcting pages which cannot initially be generated. The following provides suggestions for correcting certain errors with regards to Label and Picture size:

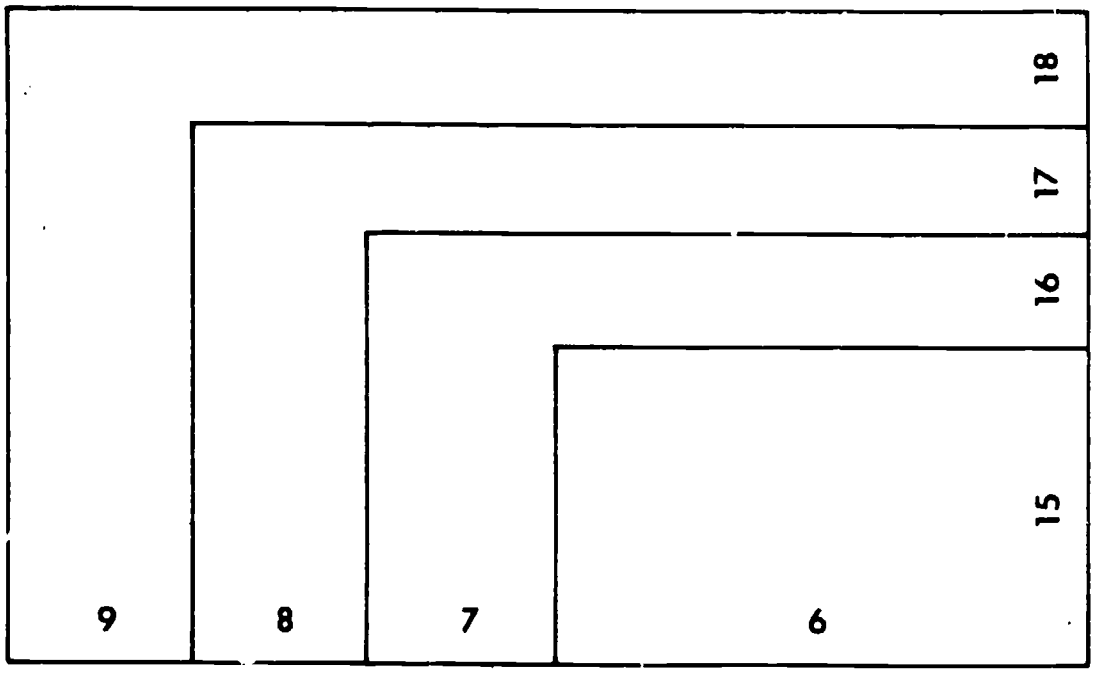
- Print out or display the page if possible. Depending on where the error occurred, the page might exist. This will give a better idea of the problem.
- If a label is too wide for a page, either reduce the label width or alter the picture size.
- If a label is too long, split or shorten the Label.
- If the internal coordinates fall outside the picture dimensions, return to the input/edit page data and recheck the dimensions.

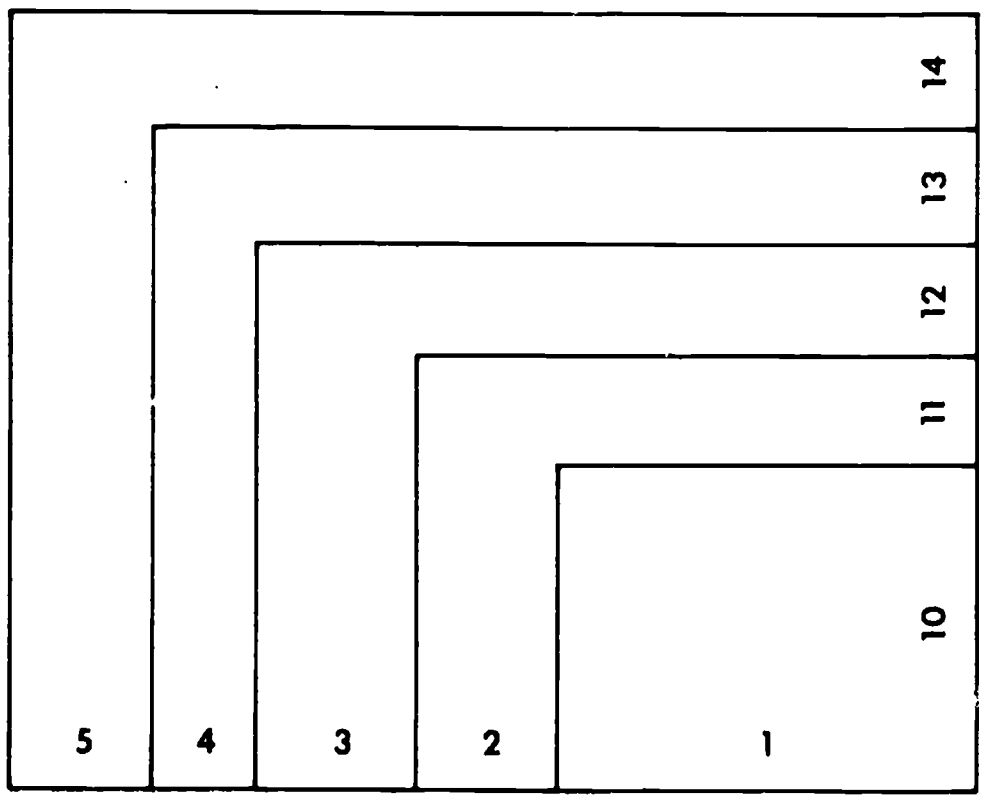
Note. A page must be regenerated if (1) the dimensions of the label change, (2) the picture dimensions change, and/or (3) the picture label relationships change. However, if text is edited within the label and the dimensions are unchanged, the page does not have to be regenerated.

APPENDIX D

MASTER TEMPLET FOR DEFAULT PICTURE SIZES AND LABEL CHARACTER WIDTHS

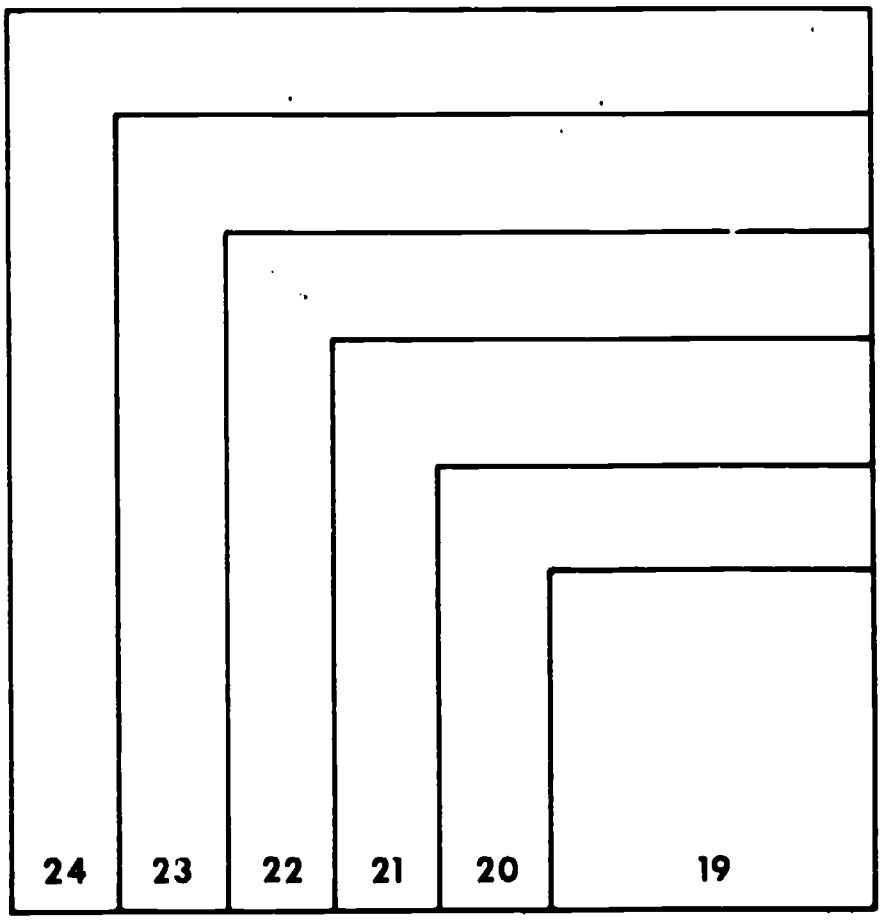
Master Templet for Default Picture Sizes





Use this Master Templet for Default Picture Sizes to make transparencies that can be laid on top of illustrations to determine default picture size values.

Master Templet for Default Picture Sizes (Continued)



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