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AUTOMATED ESTIMATING SYSTEM (AES)

VERSION 5.1

USER'S MANUAL

D. A. Holder

August 1992

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Engineering and Production Management Systems

Edited by: R. K. Schwarz

August 1992

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for the U.S. DEPARTMENT OF ENERGY

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ACKNOWLEDGEMENTS

The information presented in this manual reached its present level of utility through the efforts of R. K. Schwarz, who prepared and edited the text revisions of this manual.

ABSTRACT

This document describes Version 5.1 of the Automated Estimating System (AES), a personal computer-based software package. The AES is designed to aid in the creation, updating, and reporting of project cost estimates for the Estimating and Scheduling Department of the Martin Marietta Energy Systems, Inc., Engineering Division. AES provides formatted input screens to guide the user through the estimate creation/update process and provides several standardized reports that allow cost to be sorted and summarized in many different formats and at several levels of aggregation.

1.0 INTRODUCTION

1.1 SYSTEM OVERVIEW

The Automated Estimating System (AES) is a personal computer software package developed for the Planning, Estimating, and Scheduling Engineering Department of the Engineering Division of Martin Marietta Energy Systems to aid in the preparation and reporting of construction cost estimates. It is maintained by the Engineering Design Information Systems (EDIS) Section of the Computing and Telecommunications Division (C&TD) and the Management Systems Engineering Department of the Engineering Division of Martin Marietta Energy Systems. The system provides an easy method for entering and updating the detailed cost, schedule, and escalation information contained in a typical construction cost estimate. The AES combines this information to calculate both unescalated and escalated values for the estimate. These costs can be reported at varying levels of detail.

The system offers several advantages over existing manual and computerized estimating methods in the following areas:

Ease of Use — The AES uses menus and formatted input screens to guide the user through the estimate creation/update process. Pricing data bases are available for cost retrieval and lookup. Context-sensitive messages explaining each input field are available with the touch of a single key.

Consistency — Two system features help ensure that estimates created with the system contain consistent information. Standard construction craft rates, percentage mark-up factors, and escalation rates are entered and updated using a separate program called the Standard Value program. These "standard values" are retrieved by the AES when an estimate is being created. This feature can be used to ensure that all estimates use the proper craft rates, mark-up factors, and escalation rates by restricting the use of the Standard Value program to a single person responsible for creating and distributing to all AES users an "official" standard value file. The AES also requires that certain identification information be entered for each estimate created using the system. Examples of required information include Project Number, Work Breakdown Structure, and DOE Cost Code of Accounts. The entry of information into required fields is enforced during the data entry process. The computer bell will sound and the cursor will not move past a required field until an entry is made.

Accuracy — The system requires that the detailed estimate information be entered once. These data may then be sorted and reported at varying levels of detail. This eliminates the possibility of errors being introduced when the estimate is summarized manually in many different formats and at several levels of aggregation.

Analysis — The ease and speed with which the estimate information can be sorted and summarized provides a powerful analytical tool. In addition, the system can output the detailed estimate information to an ASCII file in a format that can be imported into Lotus 1-2-3 for further manipulation or analysis. The AES also allows "what if" questions concerning the effect of possible schedule, labor rate, or escalation rate changes to be answered quickly.

Economy — Although the AES can interface with mainframe systems via file import/export capabilities, AES runs entirely on personal computers and is capable of running on a token ring network. In many cases this can offer significant cost advantages over mainframe processing.

1.2 SYSTEM DESCRIPTION

The AES consists of two major programs: the Standard Value program and the Estimate Creation/Update/Scheduling/Contingency/Reporting program (Estimating program).

The Standard Value program is used to input and update the construction craft rates, percentage mark-up factors, and the escalation rates that are to be used on each estimate created using the system. This program is operated and controlled by a single authorized individual. Documentation for this program is provided in the Automated Estimating System (AES) Standard Value and Guidelines Programs User's Manual (K/CSD/TM-102).

The Estimating program is used to enter and/or update the detailed cost estimates, combine several estimates to form a project cost estimate, create and/or update a project schedule file, produce reports, and perform various analysis functions. The operation of the AES Estimating program is described in this manual.

1.3 ORGANIZATION OF THIS MANUAL

This manual is divided into thirteen major sections and five appendixes, each dealing with a specific aspect of the AES.

Section	Description
1.0	Contains a general overview of the AES and a description of the organization of the manual.
2.0	Includes information you need to know before installing the system on your personal computer. The first part of Sect. 2.0 describes the hardware and software required by the AES. The second part describes the files used by the system. The third and last part tells you how to install the program on a personal computer.
3.0	Contains general information about the operation of the AES. The use of the menu and input/update screens is described. Explanations of how to enter and update data within each screen field, how to move from field to field within a screen, and how to move from screen to screen are found here.
4.0 and 5.0	Explains how to use the Estimating program to create and update estimates. Included here is detailed information about the order in which screens will appear and the information that must be entered within each screen.
6.0	Explains how to create or update a project schedule file.
7.0	Describes how to create or update a contingency analysis file.
8.0	Describes how to list, create, or update WBS title records.

Section	Description
9.0	Describes how to use the Estimating program to generate reports.
10.0	Explains the various utility functions that accompany the Estimating program.
11.0	Describes how to direct the computer to a specific drive and directory.
12.0	Describes the procedure to view the guidelines.
13.0	Describes the procedure to enter bases of estimate information (the assumptions that affect the current estimate).
Appendix A	Describes the use of schedule by curve in the allocation of cost to the time periods.
Appendix B	Describes how escalated costs are calculated.
Appendix C	Contains the screen layouts and field definitions for each input screen in the AES.
Appendix D	Contains an example of each type of report produced by the AES.
Appendix E	Contains some of the more common error messages and a list of possible actions that may be taken to correct the error.

2.0 GETTING STARTED

2.1 REQUIRED HARDWARE/SOFTWARE

The Automated Estimating System (AES) is designed for use with the IBM PC, PC-XT, PC-AT, PS/2, or any true IBM PC-compatible microcomputer with the following minimum hardware configuration:

640KB Random Access Memory (RAM)
Color Graphics Monitor and Adapter
One 360KB Diskette Drive
One Hard Disk Drive (either fixed or removable)
A Printer.

The only software required in addition to the AES is the IBM PC Disk Operating System (DOS) version 2.0 or higher. Please note that the use of memory-resident software such as Sidekick, screen blanking programs, etc., while not specifically precluded, could possibly produce unpredictable results when used with this system.

It should be noted that at the time the computer is "booted," a file named CONFIG.SYS must be in the root directory of the drive from which the system is loaded. This file must contain at least the following two lines:

```
FILES    = ff
BUFFERS  = bb
```

where ff must be at least 15 and bb must be at least 10. The CONFIG.SYS file determines the maximum number of files that may be open at one time and the number of buffers to be allocated by DOS. For more information on the use of CONFIG.SYS files, please refer to your DOS manual.

2.2 REQUIRED FILES

The AES Estimating program uses the following disk files:

Name	Description
vvvvvvv.VAL	Standard Value file
ssssssss.SCH	Project Schedule file
ssssssss.NDX	Project Schedule Index file
eeeeeeee.EST	Estimate Record file
eeeeeeee.BMR	Bill of Material Record file
eeeeeeee.CST	Bill of Material Cost Record file
cccccccc.CNT	Contingency file
cccccccc.CDX	Contingency index file
wwwwwwww.WBS	WBS Title file
wwwwwwww.IDX	WBS index file
FACFILE.NEW	Crew index file used with CACES pricing data base
EQUIP.REC	Equipment file used with CACES pricing data base
CREW.REC	Crew makeup used with CACES pricing data base
TASK.REC	CACES pricing data base

Name	Description
FACINDEX	Crew makeup file used with CACES pricing data base
CSI1.NDX	CSI index file used with CACES pricing data base
CSI2.NDX	CSI index file used with CACES pricing data base
ASSEM.REC	Assembly pricing data base
ASSEM.CSI	CSI index file used with Assembly data base
BSI1.NDX	BSI index file used with Assembly data base
BSI2.NDX	BSI index file used with Assembly data base
CRAFT.TAB	Cross-reference table for craft codes
GUIDE.DAT	Guideline index file
GUIDE.MEM	Guideline file

(The file names are chosen by the user where designated by vvvvvvv, ssssssss, eeeeeeee, wwwwwwww, and cccccccc. The file extensions are assigned by the system. Note that the three files with extensions .EST, .BMR, and .CST must share the same name, denoted eeeeeeee here.)

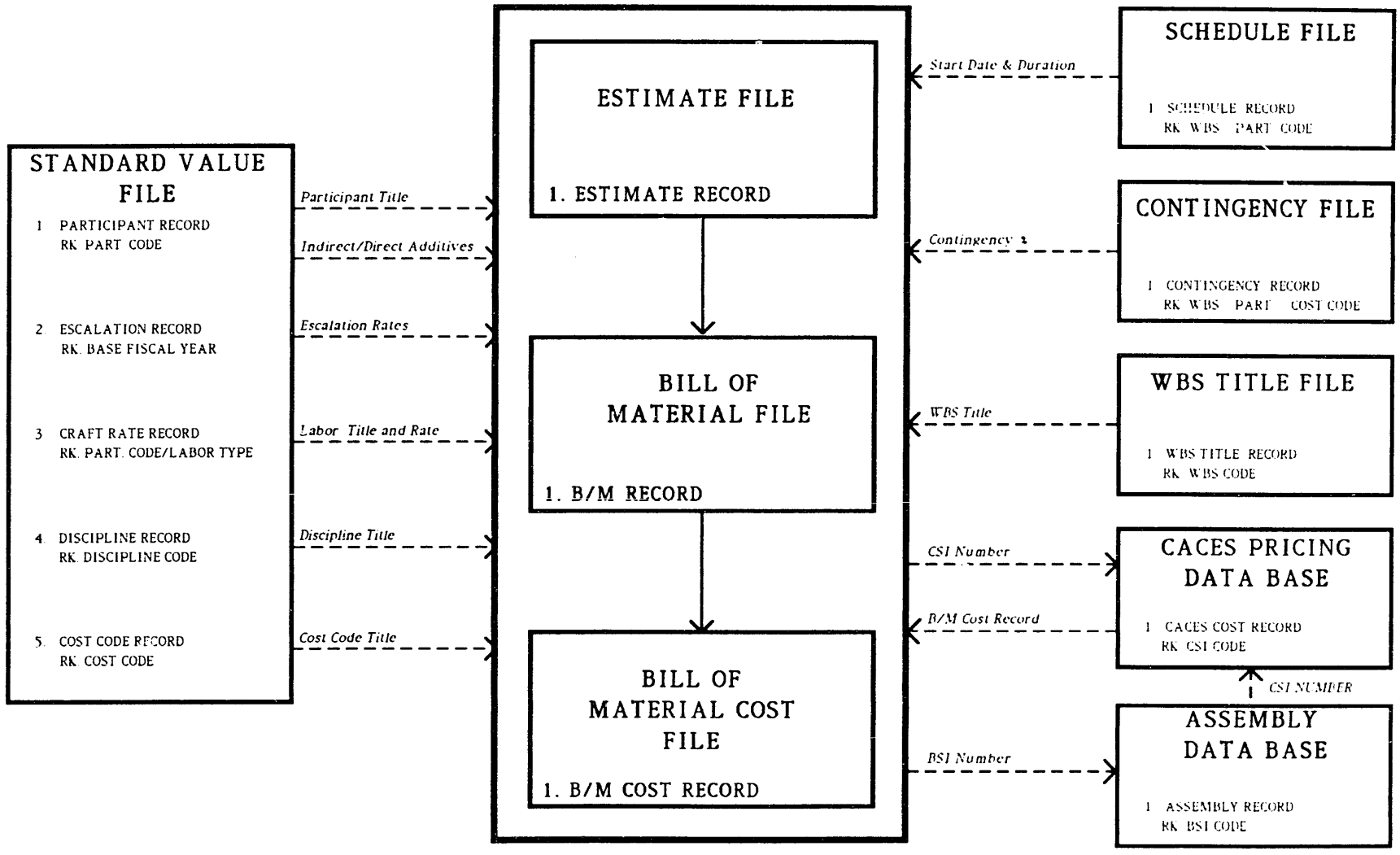
Figure 1 depicts the relationships among these files.

The Standard Value file is created and updated using a separate program. In applications where multiple users are working on the same project, this allows the file to be centrally maintained and distributed to ensure that those in use contain consistent information.

The Standard Value file (vvvvvvv.VAL) is required by the Estimating program and must reside on the same disk as the system files. It contains the sets of participant codes and titles; construction craft codes, titles, and rates; percentage mark-up values; discipline codes and titles; cost codes and titles; and escalation rates that may be used for estimates created using the system. The participant code is two characters in length and indicates the organization responsible for completing a portion of work (i.e., Cost Plus Award Fee Contractor, Fixed Price Contractor, etc.). The construction craft code is two characters in length and represents a construction craft, such as pipe fitter or carpenter. Each construction craft may have a different hourly rate for each participant. This enables the system to reflect differences in labor costs among the various participants. The percentage mark-up values are factors applied to the base costs in each estimate. These mark-up values are used to calculate costs, such as indirects, sales tax, and other costs that can be expressed as a function of direct costs. The escalation rates are used in calculating escalation factors that are used to determine the escalated value of an estimate.

The Standard Value file also contains an expiration date. The AES Estimating program uses this date to verify that the rates are still current.

The Project Schedule file (ssssssss.SCH) is required only if the estimated costs are to be reported in escalated terms. It contains the scheduled start date and the duration (in quarters) for each participant within each WBS element of a specific project. This file is used to calculate the escalated value of the estimated costs.



* RK = Retrieval Key

Fig. 1. AES File Structure.

The three files (with the common name eeeeeeee and with extensions EST, BMR, and CST) are used to store the detailed discipline cost estimate(s) and are referred to collectively as the Estimate data base. The Estimate data base may contain one or more discipline estimates. In this context, a discipline estimate refers to the estimated cost of a discrete portion of work associated with a single Engineering discipline. Within each discipline estimate, the costs are grouped into Bills of Material. The Estimate Record file contains a record for each discipline estimate in the data base. The record contains information (such as Base Fiscal Year) that applies to all Bills of Material in the discipline estimate. The Bill of Material file contains a record for each Bill of Material in the data base. The record contains information (such as Work Breakdown Structure, Participant Code, etc.) that applies to the costs within the Bill of Material. The Bill of Material Cost file contains a record for each detailed estimate item in the data base.

The existence of three separate files for the Estimate data base is transparent to you when executing the AES Estimating program. The program prompts for a file name, to which the system appends the appropriate extension (EST, BMR, or CST) prior to creating or opening each of these three files. You do, however, need to remember that three separate files are present when using DOS commands to copy or rename the Estimate data base.

The Project Contingency file (cccccccc.CNT) is required only if the contingency analysis work sheet has been used to determine contingency percentages for a project. The contingency analysis is based on cost categories at the WBS-Participant level with regard to the completeness of design and degree of difficulty. The contingency file is used to determine a contingency percentage for each Bill of Material entered into the Estimate data base.

The WBS Title file (wwwwwwww.WBS) is required only if the WBS Title File program has been used to build a title file. The WBS Title file provides consistency of WBS titles in reports.

The CACES and Assembly pricing data base files are used for retrieval and lookup of cost information. If disk space is not available to store these files, AES will execute without them, but the ability to retrieve information from the pricing data bases is lost.

The Guidelines files allow for on-line browsing of information that is relevant to the estimator. This information is available from the AES main menu and from within the update/create estimate.

2.3 INSTALLATION PROCEDURE

To install AES on a hard disk, create an AES subdirectory. Assuming that the hard drive is designated as drive C, use the following commands:

```
c:
cd c:\
mkdir AES
```

Place the AES system disk 1 into drive A and type:

```
copy a:*.* c:\AES
```

Repeat this command with the remaining AES system diskettes. Before using the programs, verify that the current version of the Standard Value file has been copied to the same disk as the AES programs. If it has not or if an updated Standard Value file is distributed after the AES programs have been installed, the file may be transferred to the system disk with the DOS COPY command. Please refer to the DOS manual for details on the use of this command.

3.0 OVERVIEW OF THE SYSTEM OPERATION

3.1 SCREEN DIAGRAMS

Figure 2 indicates the relationships among screens. As shown in the figure, the screens used for entering and updating data allow great flexibility in moving from one screen to another. Each data entry screen has an AES number in the bottom right corner that is used as a reference number throughout this document.

3.2 TYPES OF SCREENS

The AES uses three types of screens: option screens, input screens, and display screens.

An option screen allows you to select a specific task to be performed. An example of this might be to use the Main Menu screen (AES.1.0) to select "Estimate Creation" or "Report Generation".

A second screen type is an input screen, such as the Estimate Record screen (AES.2.1.2). An input screen is used primarily to enter or modify data.

The Bill of Material Directory screen (AES.2.2.1) is an example of the third screen type: a display screen. This screen is used to display the Bill of Material records and permits you to choose among several options. It will not, however, allow data entry or modification of data.

3.3 MOVING THE CURSOR WITHIN A SCREEN

The TAB key and the RETURN key always move the cursor to the next field on the input screens. The DOWN-ARROW performs the same function except in the Bill of Material Cost screen (AES.2.3) and the Bill of Material Directory screen (AES.2.2.1). Each of these screens displays several records, and on these, the DOWN-ARROW moves the cursor to the next record.

The SHIFT TAB keys move the cursor back to the previous field on any screen. The UP-ARROW performs the same function except in the Bill of Material Cost screen (AES.2.3) and the Bill of Material Directory screen (AES.2.2.1). On these, the UP-ARROW is used to move to the previous record.

The PAGE-DOWN and PAGE-UP keys are used on the Bill of Material Directory screen (AES.2.2.1) and the Cost screen (AES.2.3) to cause the next and previous screen of records, respectively, to be displayed. If two or more estimates have been combined, the PAGE-DOWN or PAGE-UP key displays the next or previous estimate record, respectively, on the Estimate Record screen (AES.2.1.2).

3.4 MOVING THE CURSOR WITHIN A FIELD

The RIGHT-ARROW and LEFT-ARROW keys permit cursor movement within a field. Pressing the RIGHT-ARROW key once moves the cursor one character to the right. Pressing the LEFT-ARROW key once moves the cursor one character to the left.

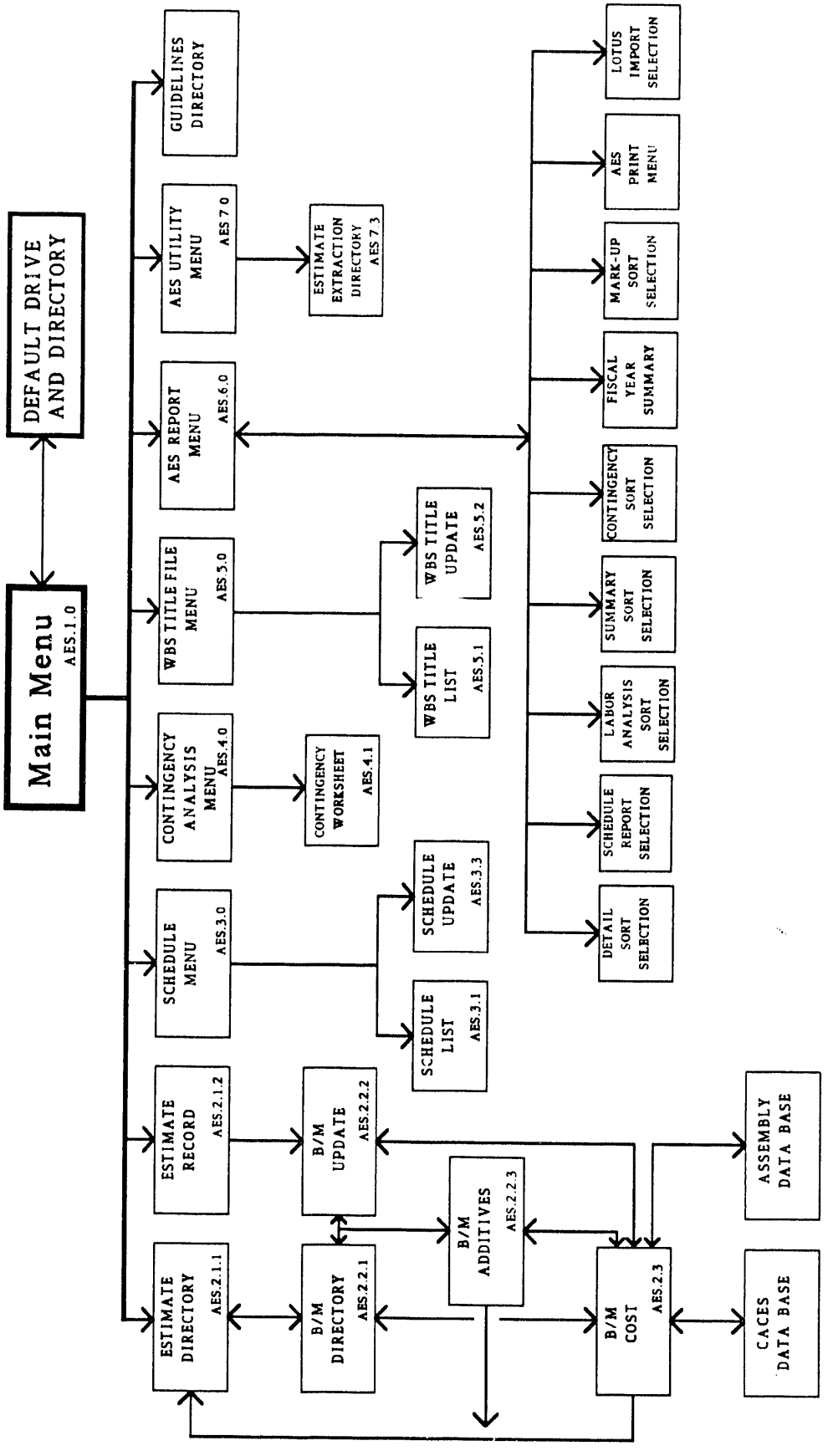


Fig. 2. AES Screen Flow.

3.5 EDITING THE CONTENTS OF A FIELD

To change a character within a field, first use the LEFT-ARROW and/or RIGHT-ARROW keys to position the cursor on the character to be changed. Type in the new character, and it will replace the one under the cursor.

To insert characters within a field, use the cursor control arrows to place the cursor at the character that insertion is to precede. Press the INSERT key once; then type in the character(s) to be inserted. The character(s) typed will be inserted in the field and will shift the remainder of the contents of the field to the right. Please note that when in the INSERT mode, the word INSERT appears at the bottom of the computer screen as an indication. Press the INSERT key once more to toggle INSERT mode off.

To delete the character located at the cursor, the DELETE key should be pressed once. The BACKSPACE is used to delete the character preceding the cursor. To delete all or part of a text field, position the cursor on the first character that is to be deleted and press the ALT key and the D key at the same time. All characters positioned at the cursor and after the cursor will be deleted.

3.6 ENTRY OF NUMERIC DATA

The AES permits only numeric characters to be entered in a numeric field.

You may wish to use the numeric key pad to speed the entry of numeric data. To do this, the NUMLOCK key must be pressed. You may now enter numbers with the keys on the numeric key pad. However, the cursor control keys will not function while in this mode. To change from numeric mode back to cursor control mode, press the NUMLOCK key once again.

3.7 USING FUNCTION KEYS

The AES uses function keys to move between screens and to invoke other features as well. A description of the action taken when each function key is pressed is presented in Fig. 3. Figure 4 indicates which function keys are operable on particular screens. The screens are listed by screen reference number as they appear in Fig. 2.

An attempt has been made to restrict the definition of each function key to a single operation without regard to your location within the program. This results in some function keys having defined operations on more than one screen. Alternatively, not every function key is defined for every screen.

Please note that the AES records a newly entered or modified record in the proper file before leaving a particular screen to go to another.

3.8 MOVING AND COPYING BLOCKS OF DATA

Lines of data on B/M screens can be marked for moving or copying to another line on the same screen or to another B/M screen using the ALT-B, ALT-C, and ALT-M commands. See Sect. 5.7 for instructions on performing this function.

Fig. 3. Function Keys Descriptions.

Function Key	Description
F1=>Help	Display a help message for the field on which the cursor is positioned.
F2=>Add	Open a blank line on the Bill of Material (B/M) Cost screen (AES.2.3) to allow a cost record to be inserted between two existing cost records.
F2=>Add Estimate	Display the Estimate Record screen (AES.2.1.2) and allow a new estimate record to be entered. This screen repeats all fields from the previous estimate record.
F3=>Update B/M	Display the Bill of Material Record screen (AES.2.2.2) and the B/M Record to be updated.
F3=>Update Estimate	Display the Estimate Record screen (AES.2.1.2) and the estimate record to be updated.
F3=>Data Bases	Allow browsing or retrieval from the CACES or Assembly pricing data base.
F4=>Delete	Delete an estimate record on the Estimate Record screen (2.1.2). Delete a B/M record on the Bill of Material Record screen (AES.2.2.2). Delete a Cost Record on the Bill of Material Cost screen (AES.2.3). Set all additives values to zero on the Bill of Material Additive screen (AES.2.2.3).
F5=>B/M Additives	Display the Bill of Material Additives screen (AES.2.2.3) and permit additives to be entered or updated. This screen initially repeats all additive values from the previous B/M record.
F6=>Add B/M	Display the Bill of Material Record screen (AES.2.2.2) and allow a new B/M record to be entered. This screen repeats all fields from the previous B/M record.
F7=>B/M Dir	Display the Bill of Material Directory screen (AES.2.2.1).
F8=>B/M Cost	Return to the Bill of Material Cost screen (AES.2.3). Cost records can then be added, modified, or deleted.
F9=>Est.Dir.	Return to the Estimate Directory screen (AES.2.1.1), where the estimate record can be modified.
F10=>Main Menu	Return to the Main Menu (AES.1.0).

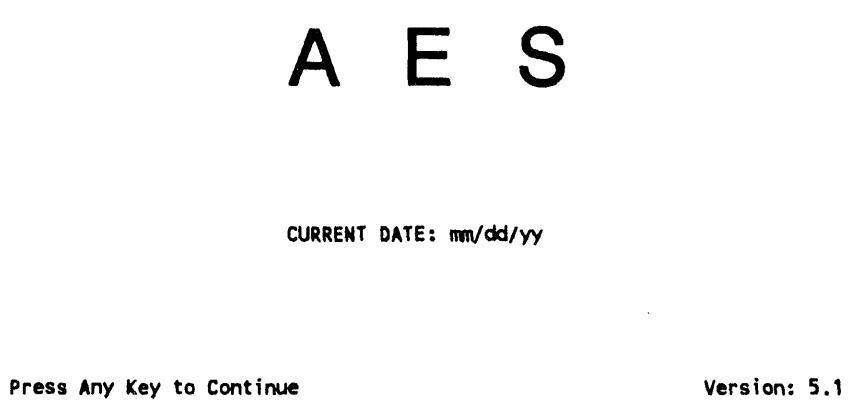
Fig. 4. Function Keys and Screens.

	Screens					
Function Keys	AES.2.1.1	AES.2.1.2	AES.2.2.1	AES.2.2.2	AES.2.2.3	AES.2.3
F1=>Help		XXX	XXX	XXX	XXX	XXX
F2=>Add						XXX
F2=>Add Estimate	XXX					
F3=>Update B/M			XXX			
F3=>Update Estimate	XXX					
F3=>Data Bases						XXX
F4=>Delete		XXX		XXX	XXX	XXX
F5=>B/M Additive			XXX	XXX		XXX
F6=>Add B/M		XXX	XXX	XXX	XXX	XXX
F7=>B/M Dir	XXX	XXX		XXX	XXX	XXX
F8=>B/M Cost			XXX	XXX	XXX	
F9=>Est.Dir.		XXX	XXX	XXX	XXX	XXX
F10=>Main Menu	XXX	XXX	XXX	XXX	XXX	XXX

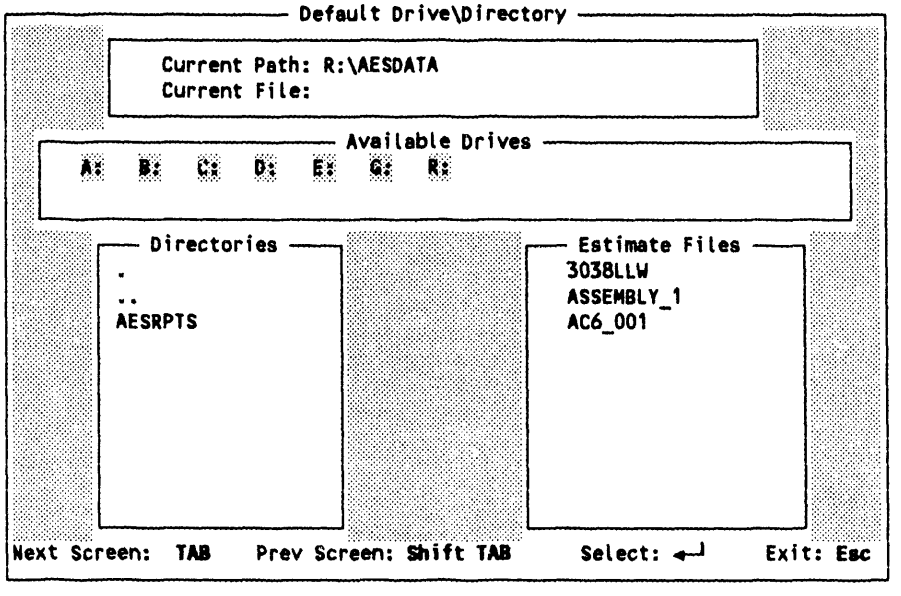
XXX indicates that the function key is operable for the indicated screen.

3.9 PROGRAM EXECUTION

To execute the AES Estimating program, type AES at the DOS prompt. The first screen to appear will be the following:



Press any key to continue to the Default Drive/Directory screen.

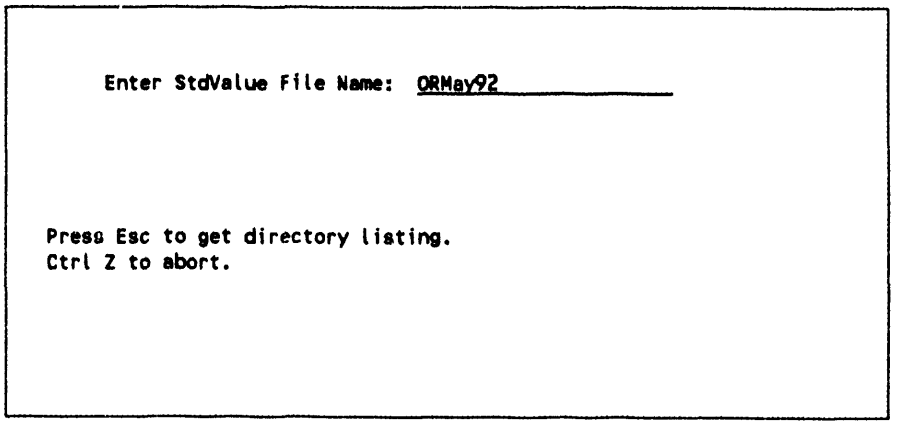


If the file to be used is on a different disk drive or directory than the default drive and/or directory, this may be indicated in the file name by entering X:\ddddddd\file name. All existing drives, including local area network (LAN) drives are displayed as well as all subdirectories under the current directory. Use the UP- and DOWN-ARROW keys to position the cursor on the desired drive and/or directory and press the RETURN key to select. The current setting is displayed at the top of the screen, and any existing estimate

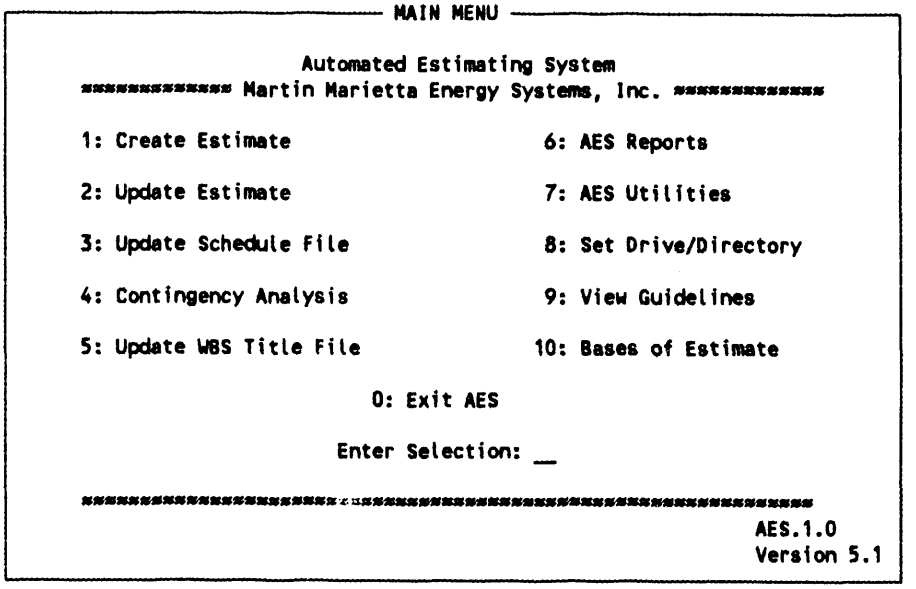
files found in the selected drive/directory are displayed for optional selection. The TAB and SHIFT-TAB keys allow cursor movement between the drive, directory, and estimate file selection. After the drive/directory settings are correct, press the ESC key to continue.

Please note that any time you are asked to enter a file name, the response should not include a file extension. The system will always append the appropriate file extension.

After the default drive and directory is set, the current Standard Value File Name is displayed:



If this is not the correct Standard Value file name, enter the correct Standard Value file name and press RETURN. The system will check for the existence of the file and its expiration date. If the file does not exist, an error message is displayed, and the system prompts for another Standard Value file. If the Standard Value file has expired, a warning message is displayed, and a prompt asks you if you wish to continue with the selected Standard Value file. If this is the correct Standard Value file name, press RETURN to continue to the AES Main Menu.



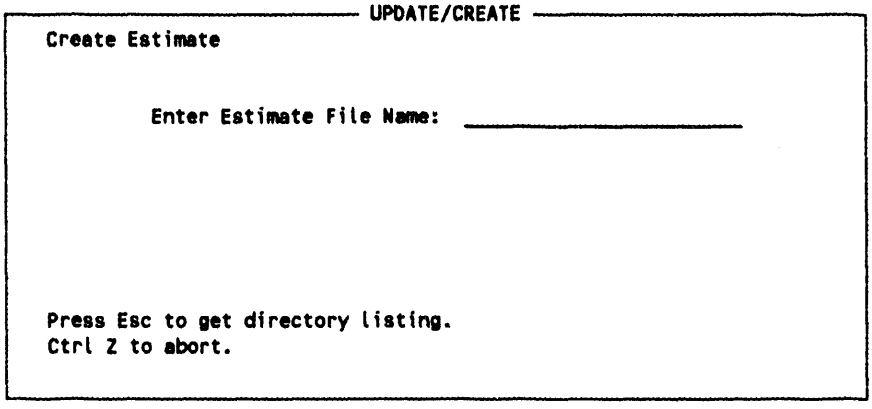
The Main Menu displays the options that are available. To select an option, press the desired option number. The AES responds with prompts and screens to define the information necessary to perform the selected option.

Each of the options from the Main Menu is discussed in detail in the following sections of this manual.

4.0 CREATING AN ESTIMATE

4.1 ENTERING FILE NAMES

To create a new estimate, select the Create Estimate option from the Main Menu. The system will respond with the following screen:

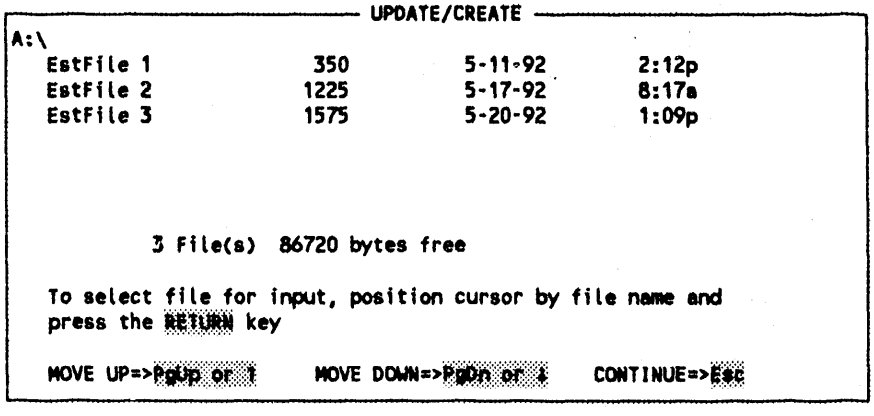


Enter the file name you wish to use for this estimate (DO NOT INCLUDE A FILE EXTENSION) and press RETURN. The file name can be a maximum of eight characters in length. The system appends the appropriate standard file extension for the estimate file. If an estimate file already exists with the file name just entered, the system prints:

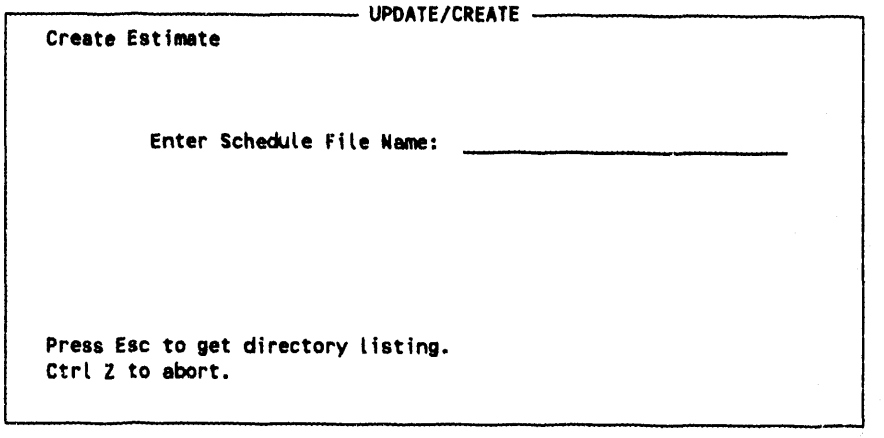
ERROR!! Estimate File Already Exists.

The system then prompts once again for the estimate file name.

To check the directory listing of estimate file names, press the ESC key. The listing is formatted as follows:



None of the file names on this listing will be accepted by the system for creating a new estimate. Press ESC to return to the file name prompt and enter a new file name. Once the estimate file name has been entered correctly, the system responds with a prompt for a schedule file name (see Sect. 6.0 for information on creating schedule files).

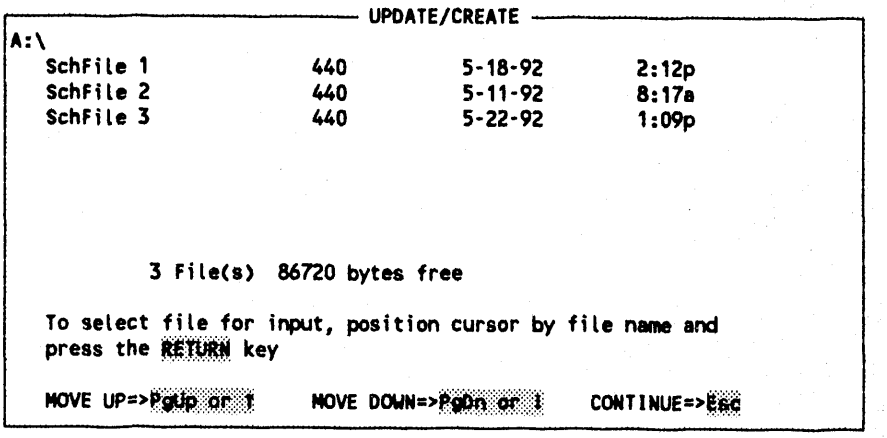


If a schedule file is not being used, press the RETURN key to continue. If a schedule file is being used, type in the schedule file name (DO NOT INCLUDE A FILE EXTENSION). If the system cannot find the schedule file name entered, it issues the following warning:

WARNING!! Schedule File Does Not Exist.

The system then prompts once again for the schedule file name.

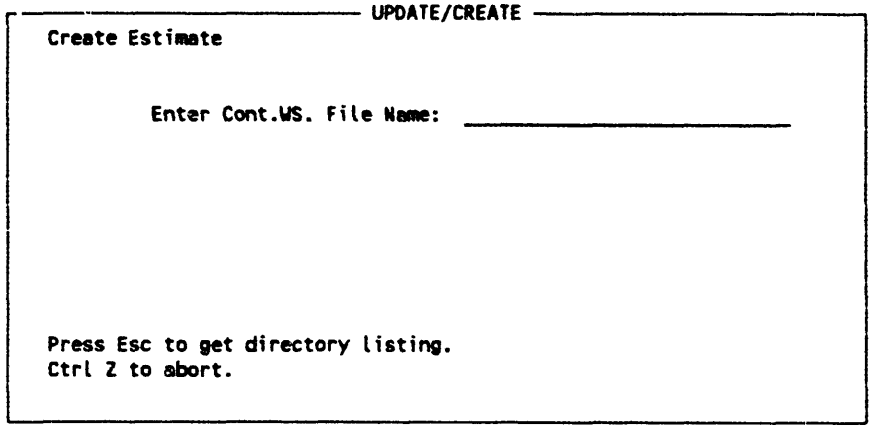
The schedule file name can also be selected from the directory listing. Press the ESC key to produce the directory listing of schedule files.



The PAGE-UP, UP-ARROW, PAGE-DOWN, and DOWN-ARROW keys are used to move the cursor next to the schedule file name to be selected for input. After positioning the cursor by the appropriate file name, press the RETURN key to mark this file for input. An asterisk (*) appears by the file name selected.

Press the ESC key to return to the file name prompt. The schedule file name selected is displayed. Press the RETURN key to continue.

Once a valid schedule file name has been entered or the RETURN key has been pressed, the system displays the prompt for a contingency work sheet (WS) file name:

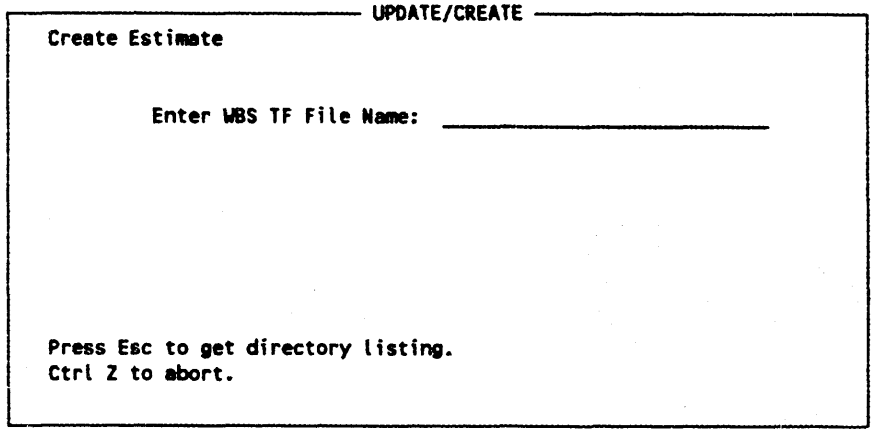


If a Contingency Work Sheet file is not being used, press the RETURN key. If a Contingency Work Sheet file is being used, enter a file name and press RETURN. If the file name does not exist, the system issues the following warning:

WARNING!! Contingency File Does Not Exist.

The directory listing can be viewed and a file name selection can be made from the listing in the same manner as described above for selecting the schedule file name.

When a valid contingency file name has been entered or the RETURN key has been pressed, the system displays the prompt for a WBS Title File name:



If a WBS Title file is not being used, press the RETURN key. If a WBS Title file is being used, enter a file name and press RETURN. If the file name does not exist, the system issues the following warning:

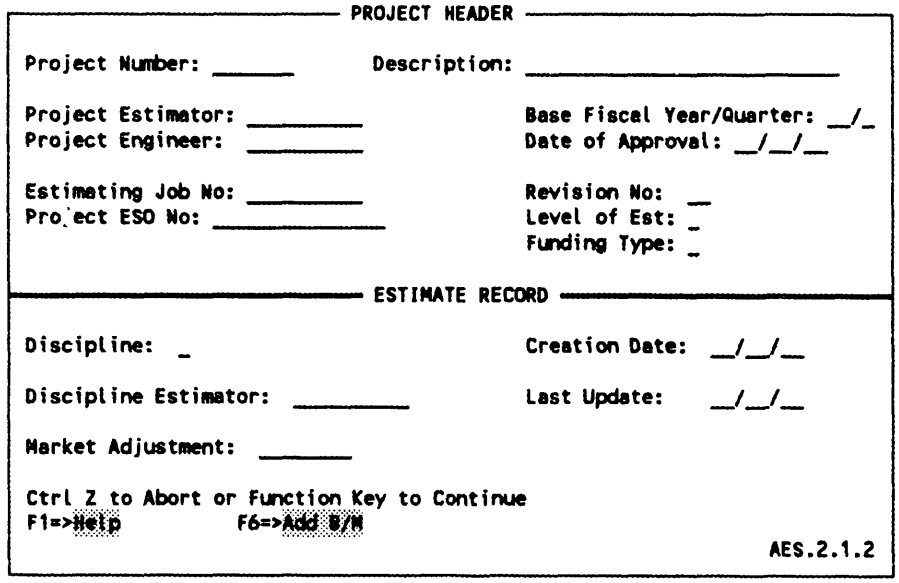
WARNING!! WBS Title File Does Not Exist.

The directory listing can be viewed, and a file name selection can be made from the listing in the same manner as described above for selecting the schedule file name.

When a valid WBS Title file name has been entered or the RETURN key has been pressed, the system displays the Estimate Record screen (AES.2.1.2).

4.2 ENTERING THE ESTIMATE RECORD

Estimate Record Screen (AES.2.1.2)

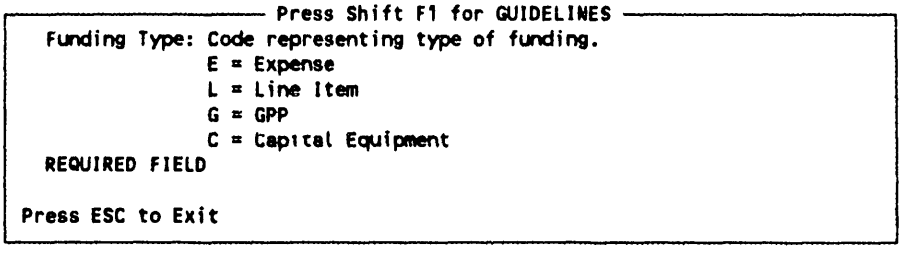


Enter the available information for the project. The RETURN key can be pressed to move to the next field after the data have been typed or when no data are entered for a field. However, entries in the following fields are required before other fields can be accessed, and these fields are validated:

Project Number
Base Fiscal Year/Quarter
Revision Number
Level of Estimate
Funding Type
Discipline

The project header data need only be entered once. This information is automatically repeated on any subsequent screens the system generates for this project. Once the estimate record data have been entered, press function key F6=>Add B/M. If the data are correct, the system continues to the Bill of Material Record screen (AES.2.2.2).

If the information entered in one of the above fields is incorrect, the system responds with an error message and will not proceed until a correct entry has been made. For example, if an invalid code for Funding Type is entered, the system displays the following information on the screen:

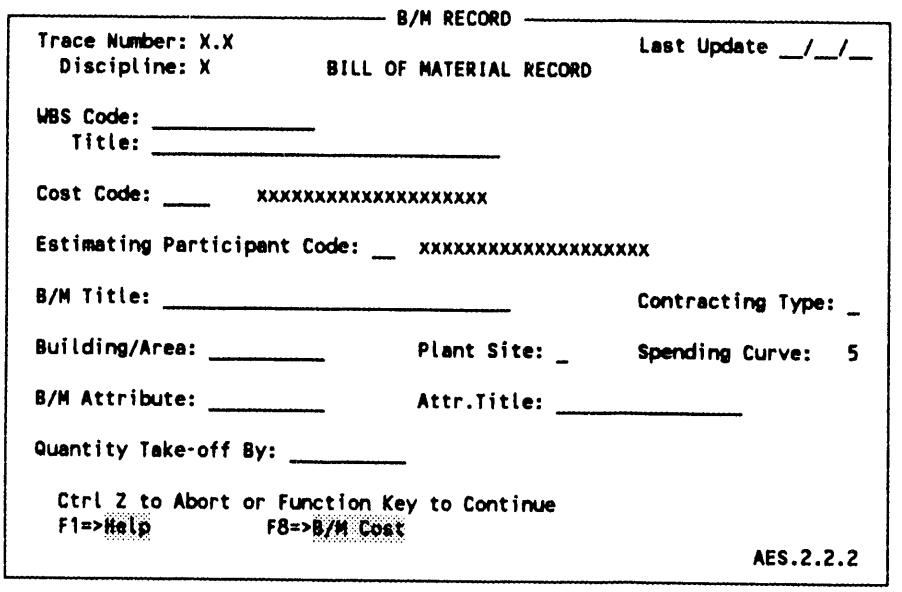


After reading the information presented and determining what the correct response should be, press the ESC key, and the cursor returns to the Funding Type field. Correct this field, and press function key F6=>Add B/M again. If other errors exist, the error correction process will be repeated.

If the data are correct, the system adds the estimate record to the Estimate data base and continues to the Bill of Material Record screen (AES.2.2.2).

4.3 ENTERING THE BILL OF MATERIAL RECORD

Bill of Material Record Screen (AES.2.2.2)



The TAB keys, UP- and DOWN-ARROW keys, and the RETURN key allow movement on the above screen in the same manner as on the Estimate Record screen. The required fields on this screen are:

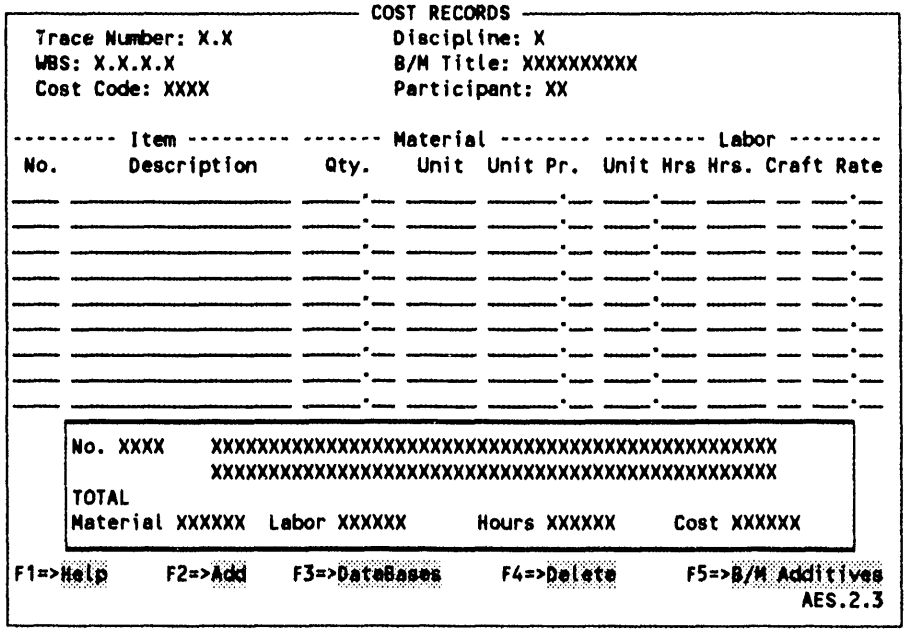
WBS
Cost Code
Estimating Participant Code
Contracting Type
Spending Curve (default value is 5)

The function key F1=>Help displays the allowable codes to be entered in each of the above fields. For example, to view the valid participant codes, place the cursor on the Estimating Participant Code field and press function key F1=>Help. A help window appears on the screen with the valid codes listed. When a valid participant code has been entered, the system displays the participant title on the screen.

Once all B/M data have been entered, press function key F8=>B/M Cost to continue to the next screen. If any field on the Bill of Material Record screen is found to be incorrect, the system responds with an error message and will not proceed until the error has been corrected. Correct this field, and press function key F8 again. If no other errors are found, the system adds the Bill of Material Record to the Estimate data base and continues to the Bill of Material Cost screen (AES.2.3).

4.4 ENTERING THE BILL OF MATERIAL COSTS

Bill of Material Cost Screen (AES.2.3)



The Bill of Material Cost screen is different from the Estimate Record screen and the Bill of Material Record screen in that it allows you to enter or view several cost records on one screen. After data have been entered on the last line of the screen, the records will scroll upward, the top record will scroll off the screen, and a blank line will appear at the bottom of the screen where the next record can be entered. As the number of records increases, the PAGE-UP and PAGE-DOWN keys may be used to scroll through the records. The UP- and DOWN-ARROW keys move the cursor from record to record. The TAB key and the RETURN key move the cursor from field to field.

The item description field in the record holds a maximum of 100 characters. The description field length on the screen holds only 20 characters, but as the description is entered, the characters will scroll left and allow the entire 100 characters to be entered. If the description is longer than 100 characters, it may be continued on the next line. Do not enter an item number on the line of the continued description. Lack of an item number indicates a continued description, and the system will not allow the cursor to advance to the other fields on a line containing a continued description. All information other than the description must be entered on the line where the item number has been entered.

Subtotals for a group of cost records can be indicated by entering ST in the item number field. If the cursor is sitting on a record containing ST in the item number field, total labor, material, and manhours for all cost records from the previous ST or from the first cost record will be displayed in the box at the bottom of the Bill of Material Cost screen. The system will not allow the cursor to advance to the other fields of a line containing ST in the item number field.

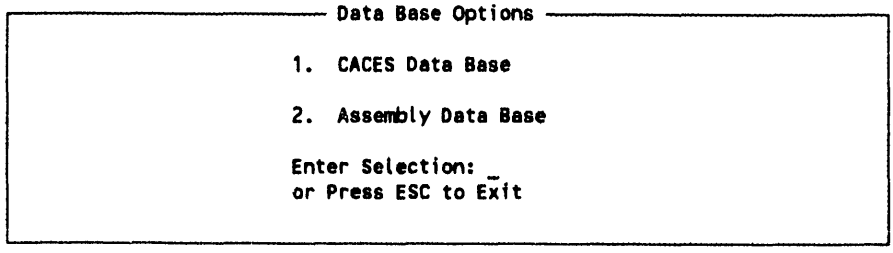
If a labor craft type is entered and is found in the valid craft codes from the Standard Value file, the system retrieves the appropriate labor rate and displays it on the screen. The system will not allow you to modify this rate. If a labor craft code cannot be found in the Standard Value file, the system permits you to enter a labor rate for this craft code.

The box at the bottom of the Bill of Material Cost screen displays the total labor and material cost as well as the entire 100 characters of the description for the record on which the cursor is sitting. If the cursor is sitting on a blank line, the cost information from the record above is displayed in this box. If the cursor is sitting on a line containing ST in the item number field, subtotals for labor and material are displayed.

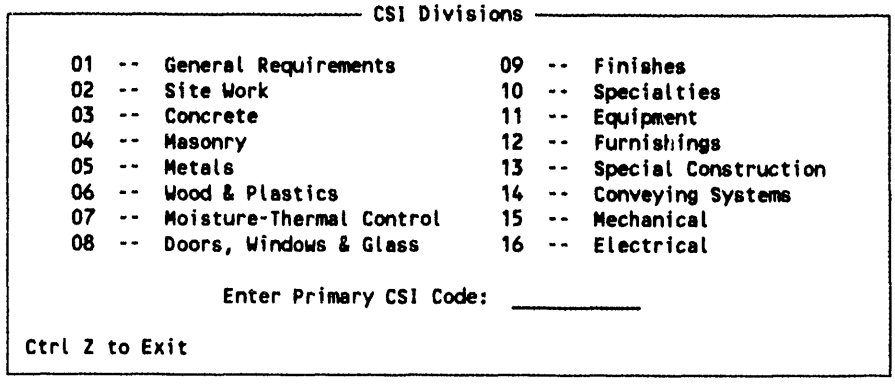
If a cost record needs to be inserted between two existing cost records, place the cursor on the cost record number that the new record is to precede and press function key F2=>Add. The system will insert a blank line above this record to permit the new record to be entered.

If a cost record needs to be deleted, position the cursor on that record number and press the function key F4=>Delete. The system will remove this record from the screen and from the cost record file.

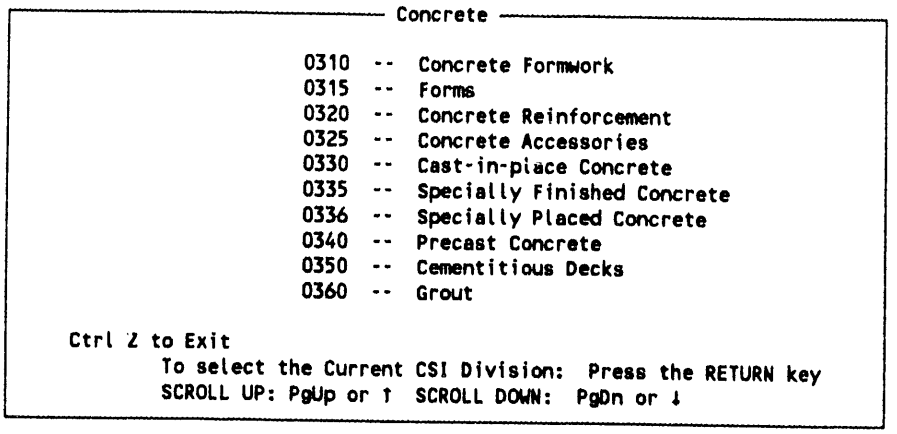
Function key F3=>DataBases allows retrieval or lookup from the CACES or Assembly pricing data base. The CACES data base is made up of task records that are composed of crews, individual material cost, and labor unit hours that are applied to the labor rates from the Standard Value file. The task records are grouped in Construction Specification Institute (CSI) format. For example, 03 is the general category "Concrete." The Assembly data base contains assemblies that are made up of task records from the CACES data base. The Assembly records are grouped according to Building System Index (BSI) format. Press the F3 key to display the following screen:



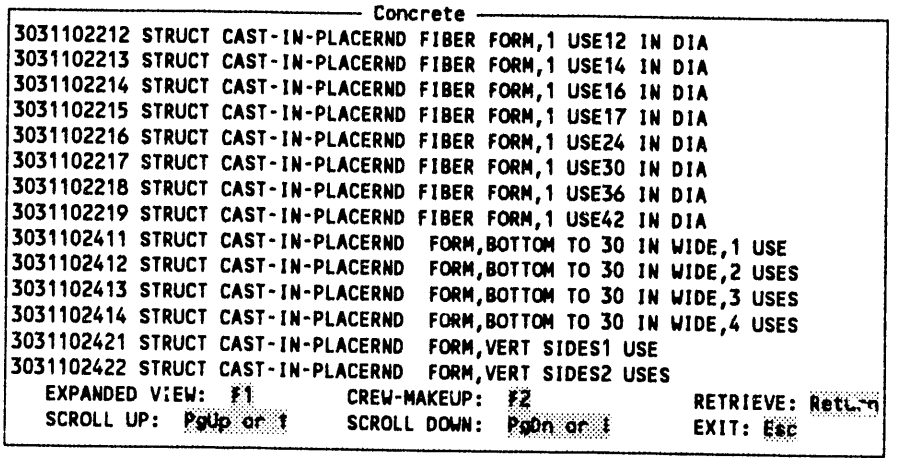
On selecting option 1, CACES data base, the following screen will appear (option 2 is described on page 28):



Enter the general CSI category (the entire CSI number may be entered if known). If the general CSI category is entered, the system continues to a new screen containing a further subcategory of the CSI number. For example, if 03 (Concrete) is entered, the following screen appears:

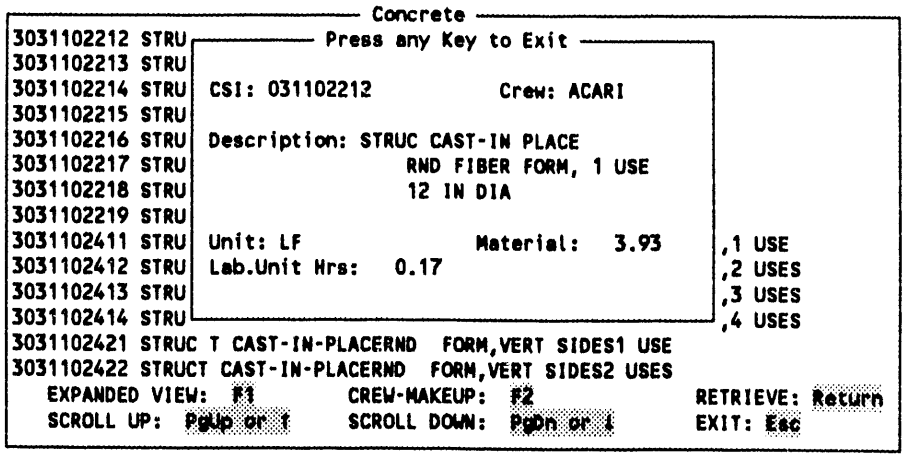


Use the UP-ARROW, PAGE-UP, DOWN-ARROW, and PAGE-DOWN keys to position the cursor by the desired division and press the RETURN key. If there is a further subcategory, the system displays another screen containing these subcategories. Once the CSI number is complete, the system enters the data base, positioned on the task record of the appropriate CSI number, and the following screen appears:

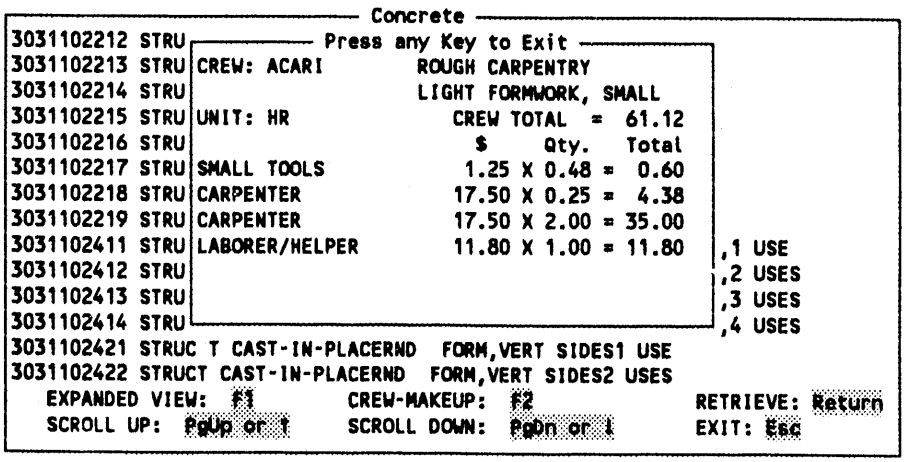


The UP-ARROW, DOWN-ARROW, PAGE-UP, and PAGE-DOWN keys are used to scroll the data base. Press the ESC key when you are ready to exit CACES and return to the Bill of Material Cost Screen.

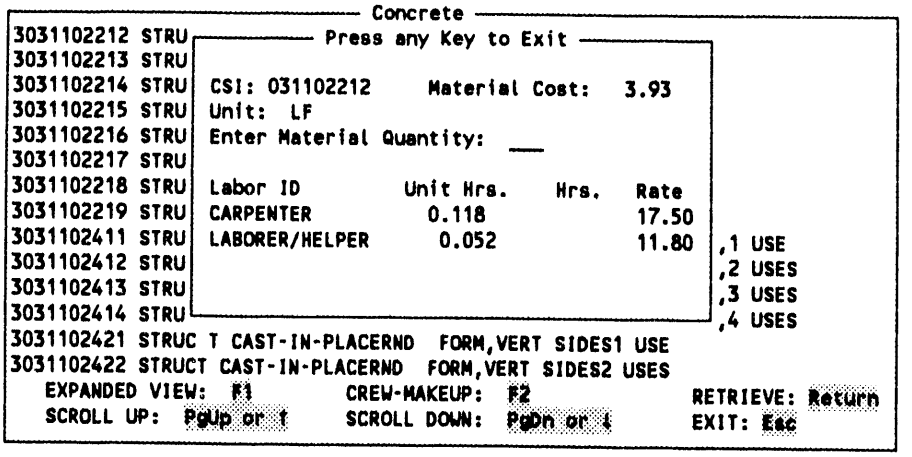
Press the F1 key to get an expanded view of the task record on which the cursor is positioned. For example, if the cursor is positioned on the task record for CSI number 031102212, the following screen appears:



Press the F2 key to display the crew makeup of the task record. Using the previous task record example, the following screen is displayed:

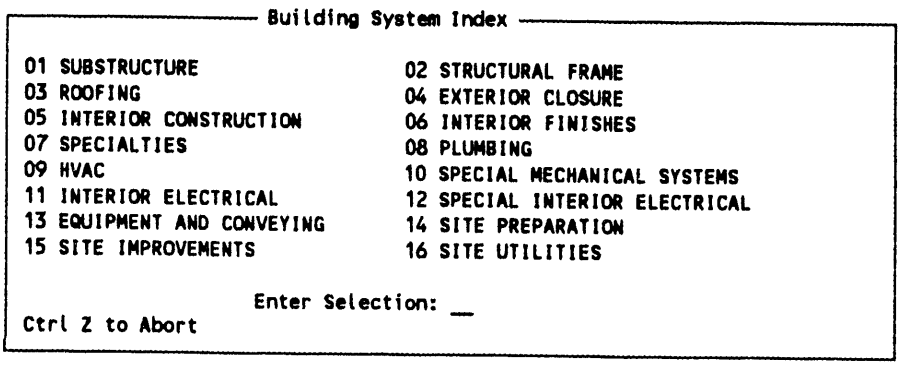


To retrieve a task record, position the cursor on the record to be retrieved and press the RETURN key. The system displays the following screen and prompts for the material quantity:

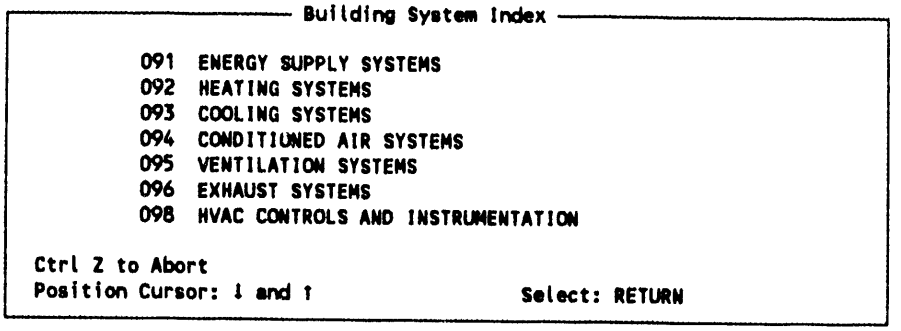


After the material quantity is entered, the system calculates and displays the total labor hours for each craft. Press the ESC key to return to the data base. A bill of material cost record is entered into the estimate for each craft displayed. The first cost record will also contain the material quantity and cost. In this example, two cost records are retrieved. Up to 20 cost records can be retrieved. When this is exceeded, the system displays a warning message. If this happens, press the ESC key to exit CACES. The system will return to the Bill of Material Cost Screen and display the records retrieved. If more records are needed from the data base, press the F3=>DataBases function key and return to the data base.

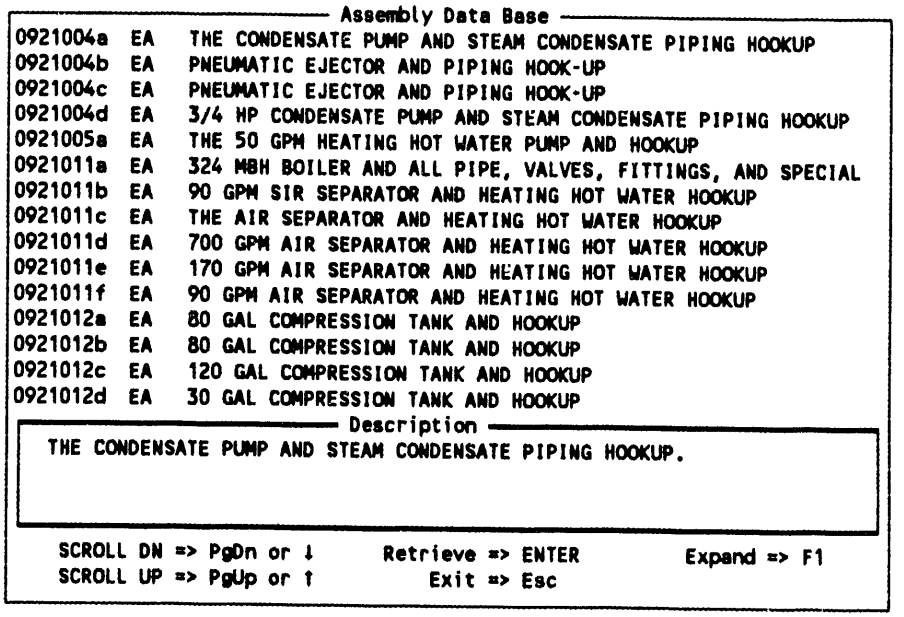
On selecting option 2, Assembly data base, from the Data Base Option screen (shown on page 25), the following screen appears:



Enter the general BSI category, and the system continues to a new screen containing a further subcategory of the BSI number. For example, if 09 (HVAC) is entered, the following screen appears:

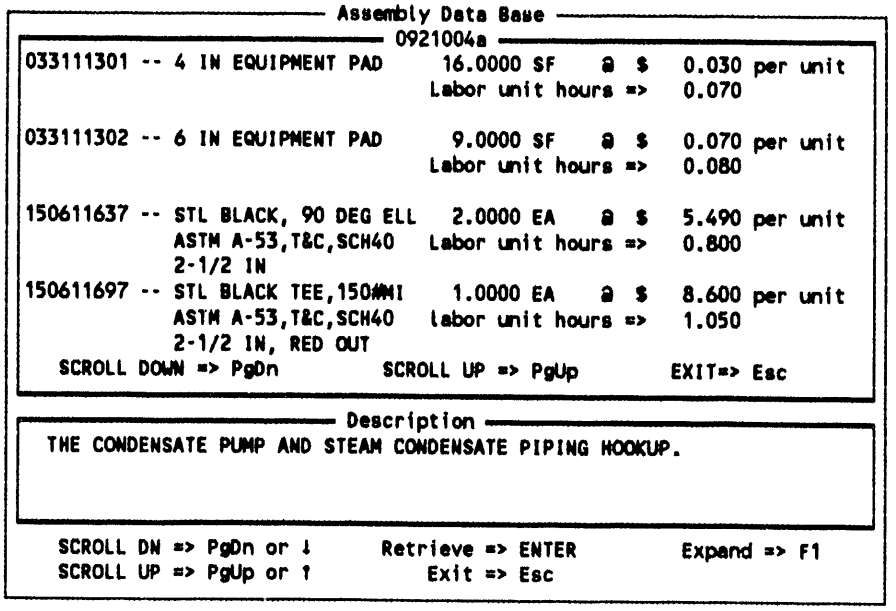


Use the UP-ARROW and DOWN-ARROW keys to position the cursor by the desired division and press the RETURN key. If there is a further subcategory, the system displays another screen containing these subcategories. Once the BSI number is complete, the system enters the data base, positioned on the assembly record of the appropriate BSI number, and the following screen appears:



The UP-ARROW, DOWN-ARROW, PAGE-UP, and PAGE-DOWN keys are used to scroll the Assembly data base. Press the ESC key to exit the Assembly data base and return to the Bill of Material Cost Screen.

Press the F1 key to get an expanded view of the assembly record on which the cursor is positioned. This function displays the CACES records that make up the assembly. For example, if the cursor is positioned on the assembly record for the BSI number 921004a, the following screen appears:



To retrieve an assembly record, position the cursor on the record to be retrieved and press the RETURN key. The system prompts for the quantity of assemblies to be retrieved:

Enter Material Quantity: __.

Enter the appropriate amount. The system returns to the Bill of Material Cost screen and displays the records retrieved. The first record that makes up the retrieved assembly contains an "A" in the fourth position of the item number field. The last record that makes up the assembly contains an "E" in the fourth position of the item number field. Positioning the cursor on this line displays the total material and labor amount for the assembly.

When all the cost records for the current Bill of Material have been entered, press function key F5=>B/M Additives to continue to the Bill of Material Additives screen (AES.2.2.3).

4.5 ENTERING THE BILL OF MATERIAL ADDITIVES

Bill of Material Additive Screen (AES.2.2.3)

```
                              B/M ADDITIVES
Trace Number: X.X                                    Discipline: X
WBS:          _________                              Participant: __
Cost Code:    ____
------------------------------ ADDITIVES -------------------------------
  Total Material Cost: _________                Total Labor Cost:  _________
                                                Total Labor Hours: _________
  Contingency  ___.__ %
                    Material  Labor                          Material  Labor
Test,Tag & Inspect.___.__ %  ___.__ %     Health Physics  ___.__ %  ___.__ %
Mobil. & DeMobil.  ___.__ %  ___.__ %     Industrial Hyg  ___.__ %  ___.__ %
Hangers & Support  ___.__ %  ___.__ %     MAA/Pidas       ___.__ %  ___.__ %
Supporting Items   ___.__ %  ___.__ %     Proc. Services  ___.__ %
Bolts,Fast.&Supply ___.__ %  ___.__ %     Shop Support               ___.__ %
Job Factor                   ___.__ %
Special            ___.__ %  ___.__ %  Description _____________________________
Special            ___.__ %  ___.__ %  Description _____________________________
Special            ___.__ %  ___.__ %  Description _____________________________
Special            ___.__ %  ___.__ %  Description _____________________________
Special            ___.__ %  ___.__ %  Description _____________________________

F1=>Help       F4=>Delete      F6=> Add B/M      F7=>B/M Dir
F8=>B/M Cost   F9=>Est.Dir.    F10=>Main Menu              AES.2.2.3
```

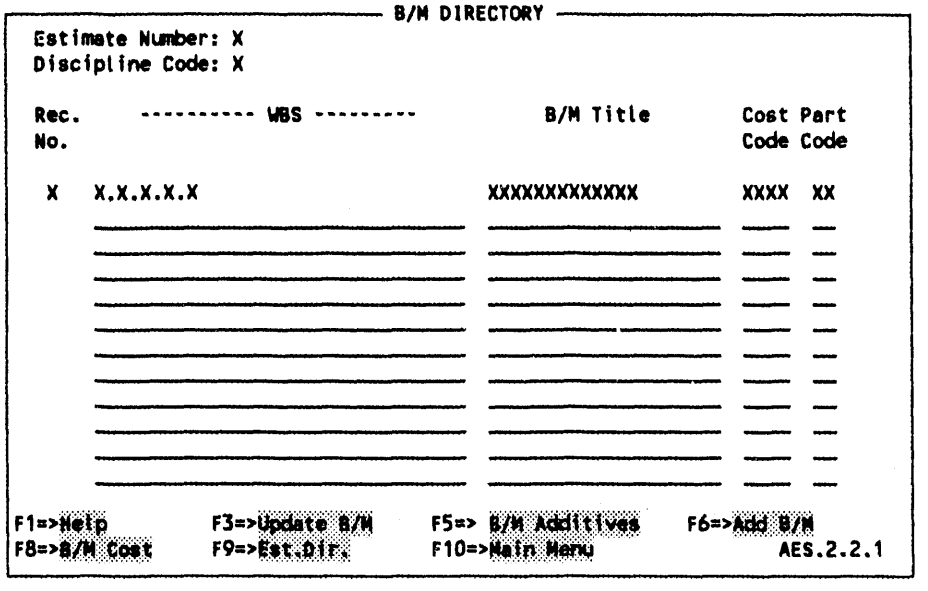
The Bill of Material Additive screen allows the entry of direct markups and contingency markup for a Bill of Material. If a Contingency file is being used, the contingency percentage will automatically be determined if contingency was calculated for the WBS, Participant, and Cost Code of the Bill of Material (see Sect. 7.1). The total labor and material cost, WBS number, cost code, and participant code for the current Bill of Material are displayed on the screen. The TAB keys, UP- and DOWN-ARROW keys, and the RETURN key work in the same manner as on the Bill of Material Record screen. If a special additive is entered, a special description must also be entered describing the special additive. Initially, the Bill of Material Additive screen displays additive values from the previous record. The function key F4=>Delete zeroes out all the additives on the screen to allow for new data entry.

After entering the proper additives for a Bill of Material record, several options exist. Press function key F6=>Add B/M to add another Bill of Material record. Press F7=>B/M Dir to display the Bill of Material Directory screen (AES.2.2.1) where a summary of the Bill of Material Records that have been entered will be displayed (see Sect. 4.6). Press F8=>B/M Cost to return to the Bill of Material Cost screen where existing cost records can be modified or additional cost records can be added. Press F9=>Est.Dir. to display the Estimate Directory screen (see Sect. 5.2), and press F10=>Main Menu to return to the Main Menu.

4.6 USING THE BILL OF MATERIAL DIRECTORY

If the Bill of Material Directory screen is selected, the following screen is displayed:

Bill of Material Directory Screen (AES.2.2.1)



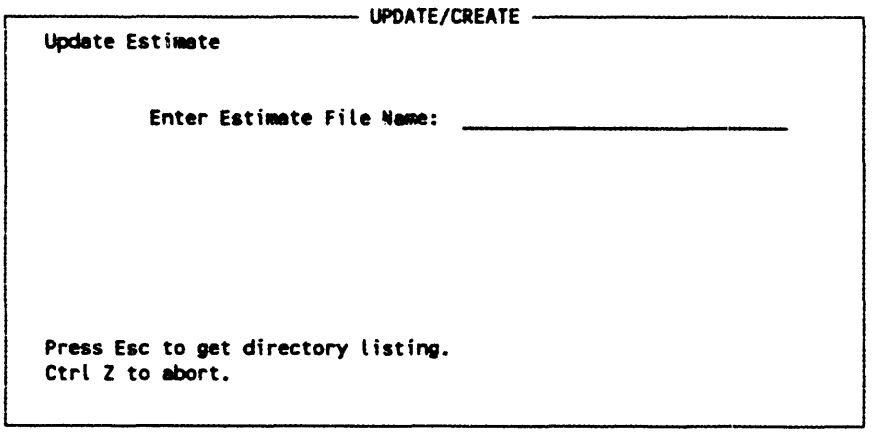
The WBS Code, cost code, participant code, and Bill of Material title for the Bill of Material records that have been entered for the current estimate are retrieved, and the first 12 will be displayed. If more records have been entered than can be displayed on the screen at one time, the PAGE-UP and PAGE-DOWN keys or the UP-ARROW and DOWN-ARROW keys may be used to scroll through the records.

Function keys listed at the bottom of the screen allow you to return to the screens that have been created for an estimate to view or update the data. These functions can be performed from this directory as described in Sect. 5.4, which lists the update procedures.

5.0 UPDATING AN ESTIMATE

5.1 ENTERING FILE NAMES

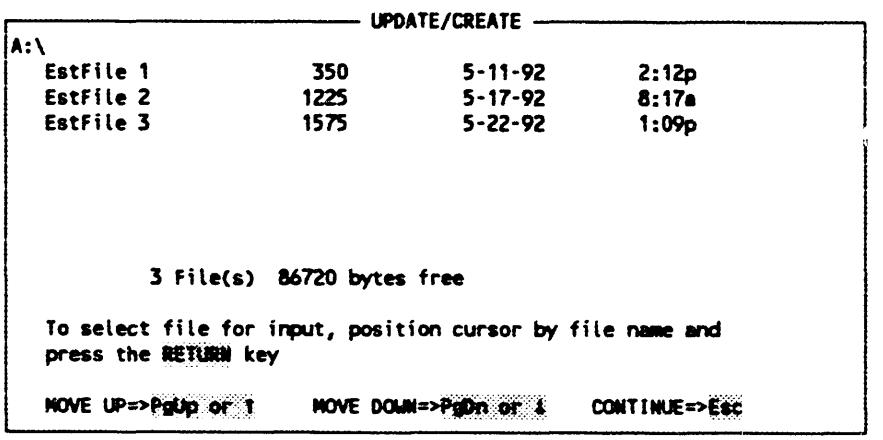
To update an existing estimate, select option 2, Update Estimate, from the Main Menu. The system will respond with the following prompt:



Type in the file name of the estimate to be updated (DO NOT INCLUDE A FILE EXTENSION). The file name can be a maximum of eight characters in length. The system appends the appropriate standard file extension for the estimate file. If the estimate file cannot be found, the system displays the following message and prompts once again for the estimate file name.

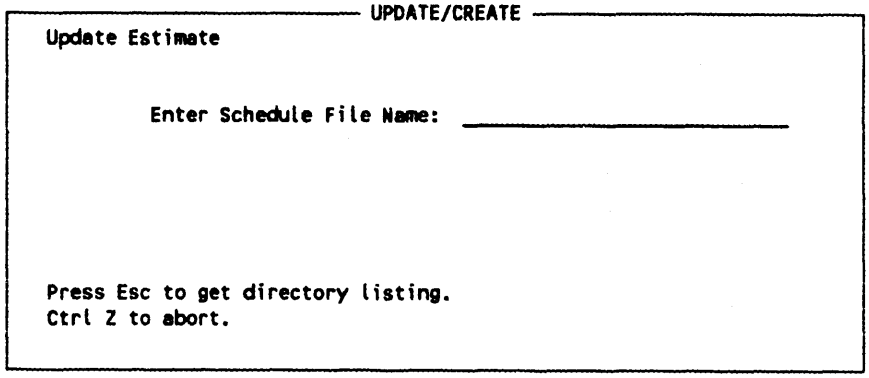
ERROR!! Estimate File Does Not Exist

The estimate file name can also be selected from the directory listing. Press the ESC key to produce the directory listing of estimate files.



The PAGE-UP, UP-ARROW, PAGE-DOWN, and DOWN-ARROW keys are used to move the cursor next to the estimate file name to be selected for input. After positioning the cursor by the appropriate file name, press the RETURN key to mark this file for input. An asterisk (*) will appear by the file name selected. Press the ESC key to return to the file name prompt. The estimate file name selected will be displayed. Press the RETURN key to continue.

Once the estimate file name has been entered correctly, the system responds with the following screen:



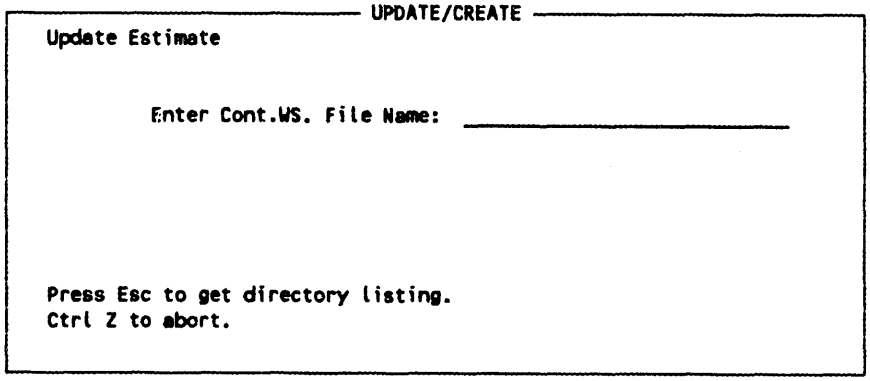
If a schedule file is not being used, press the RETURN key to continue to the Estimate Record screen. If a schedule file is being used, type in the schedule file name (DO NOT INCLUDE A FILE EXTENSION). If a schedule file name is not specified or the system cannot find the schedule file name entered, it issues the warning

WARNING!! Schedule File Does Not Exist

and again prompts for the schedule file name.

The schedule file name can also be selected from the directory listing. Press the ESC key to produce the directory listing of schedule files, which is similar to the estimate directory shown on the previous page. Follow the same directions given for the estimate directory to select a schedule file name and return to the file name prompt.

Once a valid schedule file name has been entered or the RETURN key has been pressed, the system continues to the contingency file name prompt:

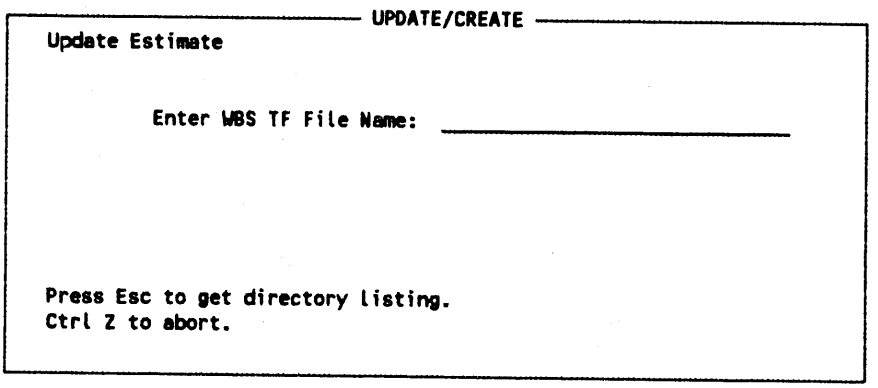


If a Contingency Work Sheet file is not being used, press the RETURN key. If a Contingency Work Sheet file is being used, enter a file name and press RETURN. If the file name does not exist, the system issues the following warning:

WARNING!! Contingency File Does Not Exist.

The directory listing can be viewed and a file name selection can be made from the listing in the same manner as described above for selecting estimate and schedule file names from their directories.

When a valid contingency file name has been entered or the RETURN key has been pressed, the system displays the prompt for a WBS Title file name:



If a WBS Title file is not being used, press the RETURN key. If a WBS Title file is being used, enter a file name and press RETURN. If the file name does not exist, the system issues the following warning:

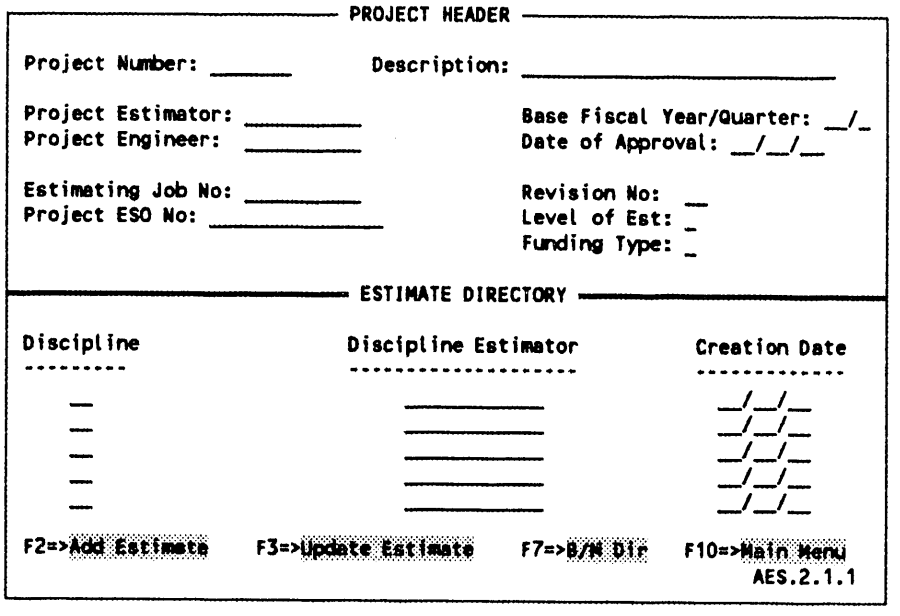
WARNING!! WBS Title File Does Not Exist.

The directory listing can be viewed, and a file name selection can be made from the listing in the same manner as described above for selecting the schedule file name.

When a valid WBS file name has been entered, the system displays the Estimate Directory screen for the Update function.

5.2 UPDATING THE ESTIMATE RECORD

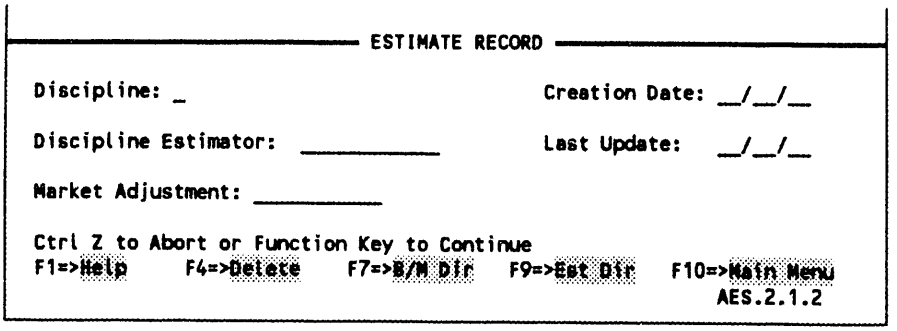
Estimate Directory Screen (AES.2.1.1)



The Estimate Directory screen is displayed along with the Project Header information. The estimates are listed individually on the directory at the bottom of the screen. Additional records can be viewed using the PAGE-UP and PAGE-DOWN keys to scroll the screen records into view. Estimates can be selected for viewing and/or update by using the UP- and DOWN-ARROW keys to place the cursor on the line of the desired estimate.

If an estimate is to be added, place the cursor on the directory line that should follow the new estimate record and press F2=>Add Estimate. The Estimate Record screen (AES.2.1.2) will be displayed for new input (see Sect. 4.2). The record displays the data for the directory line currently accessed. These data can be left as displayed or overtyped with new data as appropriate for the new record. The B/M, Cost, and Additive screens are accessed sequentially to complete the new estimate record. When the Estimate Directory is again accessed, the new estimate record is displayed on the line directly above the line indicated when the Add Estimate option was chosen.

If an estimate is to be updated, place the cursor on that record and press F3=>Update Estimate. The Estimate Record screen (AES.2.1.2) for that estimate record will be displayed in place of the Estimate Directory on the bottom half of the screen as follows:

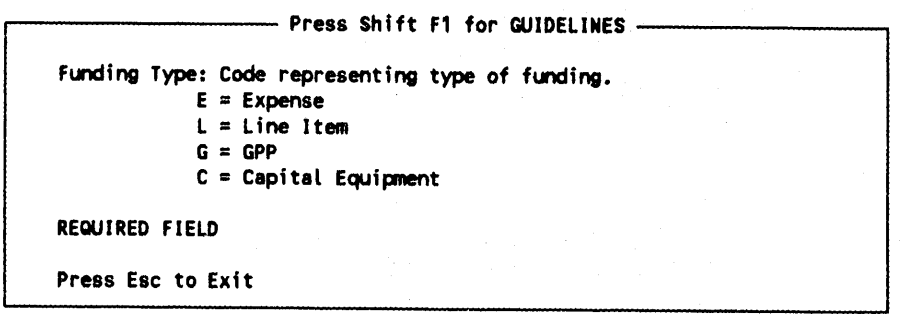


The RETURN key can be used to advance to the desired field(s), and data can be overtyped, added, or deleted as necessary. The entire record, including all related Bill of Material records and their associated cost, can be deleted using the F4=>Delete function key; you will be returned to the Estimate Directory screen. When the update is complete, you can access the B/M and Estimate Directories or return to the Main Menu.

Any changes to the entries in the following fields are validated:

Project Number
Base FiscalYear/Quarter
Level of Estimate
Funding Type
Discipline

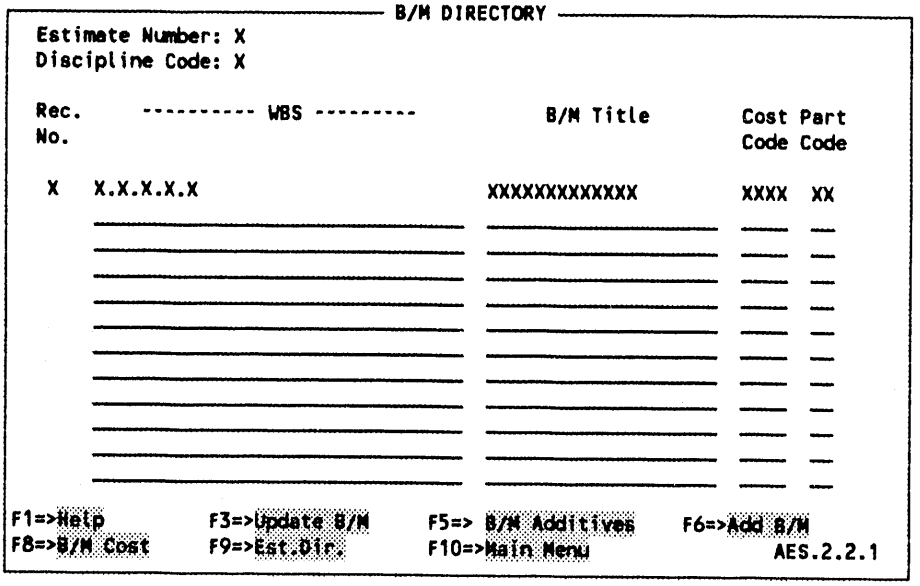
After any changes to the estimate record have been completed, if any validated field is found to be incorrect, the system responds with an error message and will not proceed until the error has been corrected. For example, if an invalid code for Funding Type was entered, the system displays the following information on the screen:



After reading the information presented and determining what the correct response should be, press the ESC key, and the cursor will return to the Funding Type field. Correct this field, and press the function key for the directory or menu that is next to be accessed.

5.3 SELECTING THE BILL OF MATERIAL

Bill of Material Directory Screen (AES.2.2.1)



The Bill of Material Directory screen displays the WBS code, cost code, participant (Part.) code, and B/M title for all Bill of Material records that have been entered for this estimate. Up to 12 records can be displayed on the screen at one time. If there are more records, the PAGE-UP and PAGE-DOWN keys may be used to scroll through the records 12 at a time.

The UP- and DOWN-ARROW keys permit scrolling through the records one at a time to position the cursor on the Bill of Material record to be changed or deleted. Press one of the option keys listed on the bottom of the screen after a record is selected in order to perform a particular function with the selected record. These update options are defined in Sect. 5.4 and described in detail in the following sections.

5.4 UPDATE OPTIONS

If additional cost records are to be added to a Bill of Material or modifications are to be made to existing cost records, place the cursor (using the UP- and/or DOWN-ARROW) on the appropriate Bill of Material record. Press function key F8=>B/M Cost. The system displays the Bill of Material Cost screen. This screen contains the cost records for this Bill of Material, and any necessary changes to the cost records can be made (see Sect. 5.6).

If a Bill of Material record is to be changed or deleted, place the cursor on that record. Press function key F3=>Update B/M, and the system displays the Bill of Material Record screen (AES.2.2.2) containing this record. From this update screen, any other update screens related to this B/M can be accessed for viewing or update (see Sect. 5.5).

If the additives for a Bill of Material record are to be modified, place the cursor on the record to be updated, and press function key F5=>B/M Additives. The system displays the Bill of Material Additive screen and permits the necessary changes to be made (see Sect. 5.8).

If another Bill of Material record is to be added, place the cursor on the record that the additional record is to follow, and press function key F6=>Add B/M. The system displays the Bill of Material Record screen. The screen duplicates and displays the data from the preceding Bill of Material. Change any fields that need to be changed, and press function key F8=>B/M Cost to continue to the Bill of Material Cost screen.

You also have the option to return to the Main Menu by pressing function key F10=>Main Menu or to return to the Estimate Directory screen by pressing function key F9=>Est.Dir.

5.5 UPDATING THE BILL OF MATERIAL RECORDS

Bill of Material Record Screen (AES.2.2.2)

```
                              B/M RECORD
Trace Number: X.X                                    Last Update __/__/__
  Discipline: X          BILL OF MATERIAL RECORD

WBS Code: _____________
   Title: ____________________________

Cost Code: ____    xxxxxxxxxxxxxxxxxxx

Estimating Participant Code: __  xxxxxxxxxxxxxxxxxxx

B/M Title: ____________________________          Contracting Type: _

Building/Area: _________        Plant Site: _     Spending Curve: __

B/M Attribute: _________        Attr.Title: _____________

Quantity Take-off By: _________

  Ctrl Z to Abort or Function Key to Continue
F1=>Help      F4=>Delete      F5=>B/M Additives    F6=> Add B/M
F7=>B/M Dir   F8=>B/M Cost    F9=>Est.Dir.         F10=>Main Menu
                                                          AES.2.2.2
```

At any time after the Bill of Material Record screen has been selected, you may press CTRL Z to abort the current changes and return to the Bill of Material Directory screen (AES.2.2.1).

5.5.1 Delete

If F3=>Update B/M has been selected and the displayed Bill of Material record is to be deleted, press function key F4=>Delete. The system displays the following prompt:

DELETE BILL OF MATERIAL RECORD ??[Y,N]: _.

Enter Y, and the system deletes the record, including all related cost and additive data, and displays the Bill of Material Directory screen.

5.5.2 Update

If a Bill of Material record is being updated, several options are displayed at the bottom of the screen. After any necessary changes have been made, press the appropriate function key to return to the screen of choice. The TAB keys, UP- and DOWN-ARROW keys, and the RETURN key allow movement on the screen to make the modifications. If any changes have been made to the record, the following fields are validated:

WBS
Cost Code
Estimating Participant Code
Contracting Type
Spending Curve.

The function key F1=>Help displays the allowable codes in each case. For example, to view the valid estimating participant codes, place the cursor on the Estimating Participant Code field, and press function

key F1. A Help Window appears on the screen with the valid codes listed. When a valid participant code has been entered, the system displays the participant title on the screen.

5.5.3 Add

If F6=>Add B/M is selected from the Bill of Material Directory screen, the record selected by the cursor from the directory screen is displayed on the Bill of Material screen. Use the TAB keys, UP- and DOWN-ARROW keys, and RETURN key to move around on the screen to make the needed changes to the displayed record. After all changes have been made to create the new record, press function key F8=>B/M Cost to continue to the Bill of Material Cost screen (AES.2.3) to enter costs for the new record. If any field on the Bill of Material Record screen is found to be incorrect, the system responds with an error message and will not proceed until the error has been corrected. Correct this field, and press function key F8 again; if no other errors are found, the system adds the Bill of Material record and continues to the Bill of Material Cost screen.

5.6 UPDATING BILL OF MATERIAL COSTS

Bill of Material Cost Screen (AES.2.3)

```
---------------------------------- COST RECORDS ------------------------------------
 Trace Number: X.X                        Discipline: X
 WBS: X.X.X.X                             B/M Title: XXXXXXXXXX
 Cost Code: XXXX                          Participant: XX

--------- Item --------- ------- Material -------- --------- Labor --------
 No.      Description      Qty.    Unit  Unit Pr.  Unit Hrs Hrs. Craft Rate
____ _______________ _____.__ _____ ______.__ ____.___ _____ __ ___.__
____ _______________ _____.__ _____ ______.__ ____.___ _____ __ ___.__
____ _______________ _____.__ _____ ______.__ ____.___ _____ __ ___.__
____ _______________ _____.__ _____ ______.__ ____.___ _____ __ ___.__
____ _______________ _____.__ _____ ______.__ ____.___ _____ __ ___.__
____ _______________ _____.__ _____ ______.__ ____.___ _____ __ ___.__
____ _______________ _____.__ _____ ______.__ ____.___ _____ __ ___.__

     No. XXXX    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     TOTAL
     Material XXXXXX    Labor XXXXXX    Hours XXXXXX     Cost XXXXXX

F1=>Help      F2=>Add      F3=>DataBases  F4=> Delete   F5=>B/M Additives
F6=>Add B/M   F7=>B/M Dir  F9=>Est.Dir.   F10=>Main Menu          AES.2.3
```

The Bill of Material Cost screen is different from the Estimate Record screen and the Bill of Material Record screen in that it allows you to enter up to eight lines of information on the screen. After data have been entered on the last line of the screen, the records will scroll upward, the top record will scroll off the screen, and a blank line will appear at the bottom of the screen where the next record may be entered. As the number of records increases, the PAGE-UP and PAGE-DOWN keys may be used to scroll through the records. The UP- and DOWN-ARROW keys move the cursor from record to record. The TAB keys and the RETURN key move the cursor from field to field.

The item description field in the record holds a maximum of 100 characters. The description field length on the screen holds only 20 characters, but as the description is entered, the characters scroll left and allow up to 100 characters to be entered. If the description is longer than 100 characters, it may be continued on the next line. Do not enter an item number on the line of the continued description. Lack of an item number indicates a continued description, and the system will not allow the cursor to advance to the other fields on a line containing a continued description. All information other than the description must be entered on the line where the item number has been entered.

Subtotals for a group of cost records can be indicated by entering ST in the item number field. If the cursor is sitting on a record containing ST in the item number field, total labor, material, and manhours for all cost records from the previous ST or from the first cost record are displayed in the box at the bottom of the Bill of Material Cost screen. The system will not allow the cursor to advance to the other fields of a line containing ST in the item number field.

If a labor craft type is entered and is found in the valid craft codes from the Standard Value file, the system retrieves the appropriate labor rate and displays it on the screen. The system will not allow modification of this rate. If a labor craft code cannot be found in the Standard Value file, the system allows you to enter a labor rate for this craft code.

The box at the bottom of the Bill of Material Cost screen displays the total labor and material cost as well as the entire 100 characters of the description for the record on which the cursor is sitting. If the

cursor is sitting on a blank line, the cost information from the record above is displayed in this box. If the cursor is sitting on a line containing ST in the item number field, subtotals for labor and material are displayed.

If a cost record needs to be inserted between two existing cost records, place the cursor on the cost record that the inserted record is to precede and press function key F2=>Add. The system will insert a blank line above this record to permit the new record to be entered.

If a cost record needs to be deleted, place the cursor on that record and press the function key F4=>Del. The system removes this record from the screen and from the cost record file.

Retrieval or lookup from the CACES pricing data base and Assembly data base can be performed by pressing the F3=>Data Bases key. For a description of the pricing data bases information and screens, see Sect. 4.4.

If this is the first time cost records have been entered for this Bill of Material record, you must continue to the Bill of Material Additive screen. When finished entering all the cost records, press function key F5=>B/M Additives, and the system displays the Bill of Material Additives screen (AES.2.2.3).

If updating costs previously entered or adding additional cost records, you are not required to go to the Bill of Material Additive screen, although that option is available. If another Bill of Material Record is to be added, press function key F6=>Add B/M, and the system displays the Bill of Material Record screen. The Bill of Material in which costs were previously entered is displayed on the screen, and any necessary changes can be made. Press function key F7=>B/M Dir to return to the Bill of Material Directory screen. Function key F9=>Est.Dir. displays the Estimate Directory screen, and function key F10=>Main Menu displays the Main Menu.

5.7 COPYING AND/OR MOVING BILL OF MATERIAL COST RECORDS

Three system commands allow you to define a group, or block, of Bill of Material cost records and then move or copy this block to a new location within the current Bill of Material or to a different Bill of Material. If a block of cost records is copied or moved to another Bill of Material with a different participant code, the system updates the labor rates based on the new participant code.

5.7.1 Mark a Block (Alt-B)

To mark a group of cost records, position the cursor on the first cost record that is to begin the block. Press the ALT key and the B key at the same time. Move the cursor to the cost record that is to end the block, and press the ALT key and the B key a second time. The block will become visibly marked on the screen. The end-block mark may be set before the begin-block mark has been set, but the block is not visibly marked until the begin-block mark is set. The block can be unmarked by defining a new block as above or by pressing the ALT and B keys only one time.

5.7.2 Copy a Block (Alt-C)

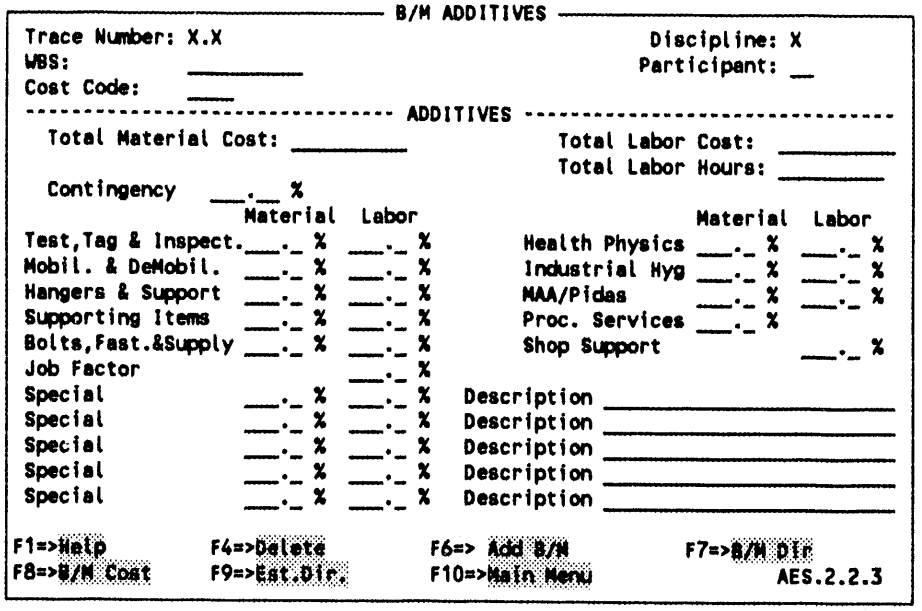
To copy a group of cost records, position the cursor on the cost record above which the block is to be copied. Press the ALT key and the C key at the same time. This command places a copy of the previously marked block above the cost record on which the cursor is positioned. The original block is left unchanged, and the new copy of cost records becomes the active block. If a block is not marked, the bell will sound, and no operation is performed.

5.7.3 Move a Block (Alt-M)

A group of cost records can be moved to a new location by setting the cursor on the cost record above which the block is to be placed. After the cursor has been positioned on the proper cost record, press the ALT key and the M key at the same time. The block of cost records are removed from their original position and placed above the current cost record. The block becomes undefined after a move and cannot be moved or copied to a different location unless it is marked again. If a block is not defined, the bell will sound, and no operation is performed.

5.8 UPDATING BILL OF MATERIAL ADDITIVES

Bill of Material Additive Screen (AES.2.2.3)



The Bill of Material Additive screen allows you to enter direct markups and a contingency markup for a Bill of Material. The total labor and material cost, WBS number, cost code, and participant code for the Bill of Material are displayed on the screen. The current additive values from the Bill of Material record are displayed on this screen.

The TAB keys, UP- and DOWN-ARROW keys, and the RETURN key allow movement on the screen in the same manner as on the Bill of Material Record screen. Any necessary changes to the additive values should be made before leaving the screen. All additive values may be set to zero by pressing function key F4=>Delete. The screen then appears with all the fields blank. If a special additive is entered, a special description must also be entered describing the special additive.

After the proper additives have been entered for a Bill of Material Record, several options exist. Press function key F6=>Add B/M to add another Bill of Material Record. Function key F7=B/M Dir returns to the Bill of Material Directory screen (AES 2.2.1); function key F8=> B/M Cost returns to the Bill of Material Cost screen; function key F9=>Est.Dir. returns to the Estimate Directory screen; and function key F10=>Main Menu returns to the Main Menu.

5.9 BILL OF MATERIAL WORK SHEET

A Bill of Material Work Sheet lists all cost information for a particular Bill of Material record. If a cost record contains zero material and/or labor cost, blanks are printed in place of the zero. This allows space for an estimator to mark up the work sheet.

To produce a Bill of Material Work Sheet, go to the Bill of Material Directory Screen (AES.2.2.1), and place the cursor (using the UP- and/or DOWN-ARROW keys) on the appropriate Bill of Material record. Press Alt-P to produce the work sheet. The work sheet is sent directly to the printer, and

*** PRINTING WORK SHEET ***

appears on the screen until the work sheet has completed printing. An example work sheet is shown in Fig. 5.

WORK SHEET

Sample Estimate
05/07/92

Discipline: C

B/M Title :

WBS 1.1.1 WBS 1.1.1
CostCode 2000
Participant 51
Contracting Type 6

Item Num.	Description	Qty.	Unit	Unit Pr.	Total Mat.	Unit Hr.	Labor Hours	Cft. Type	Labor Rate	Total Labor	Total Cost M + L
1	Remove 3" T ASP PVMT	4450.00	SY	0.50	2225	0.050	224	C1	15.00	3360	5585
2	Relocate Fence 7' H	400.00	LF	5.00	2000	0.240	96	C1	15.00	1440	3440
3	Site Excavation Earth	1600.00	CY	1.00	1600	0.020	32	C1	15.00	480	2080
4	Precast Parking Lots	200.00	LF	3.35	670	0.400	80	L	11.80	944	1614
5	Truck Rental and Haul to Disposal	10.00	DAY	100.00	1000	8.000	80	TD	12.80	1024	2024
TOTAL					7495		512			7248	14743

MARK-UP VALUES

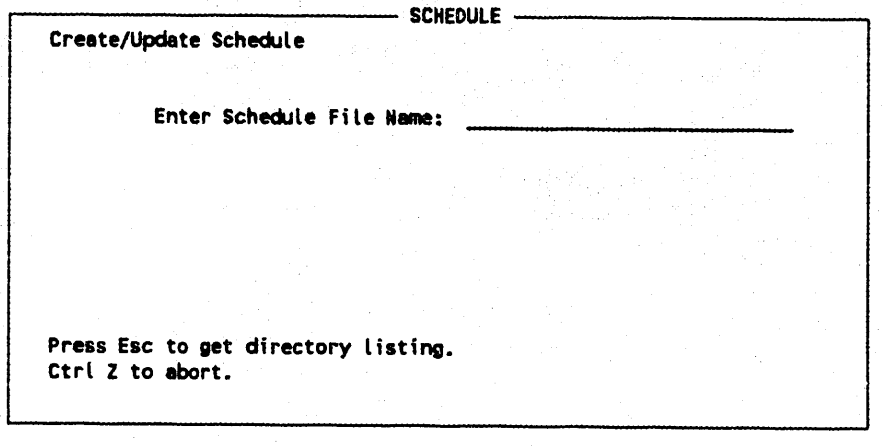
Job Factor		15.00%
Health Physics	10.00%	10.00%
Tax	7.00%	
Indirect Additives	20.00%	20.00%
Contingency	10.70%	10.70%

Fig. 5. Sample Work Sheet.

6.0 CREATE/UPDATE SCHEDULE FILE

Option 3 from the Main Menu allows for the creation and/or updating of project schedules. The schedules are maintained in a Project Schedule file and are used by AES in the calculation of escalated costs and the reporting of costs by fiscal year. The schedules, which consist of the starting fiscal year and quarter and the duration in quarters, are entered and retrieved on the basis of WBS and participant code. The schedules may be entered at any level of the WBS. For example, assume that a particular Bill of Material in an estimate has a WBS code of 1.1.1.2 and a participant code of 51. When a recalculate estimate option or a time-related report is chosen, the system first searches the Project Schedule file for a schedule record containing WBS 1.1.1.2 and participant code 51. If a schedule record is not found, the system searches the Project Schedule file for a schedule record containing WBS 1.1.1 and participant code 51. The system continues to search higher WBS levels until either a schedule record is found or the highest WBS level, 1., is reached. This feature provides flexibility in the creation and maintenance of the project schedule.

When option 3 is selected, the following screen is displayed, and the system prompts for a schedule file name.



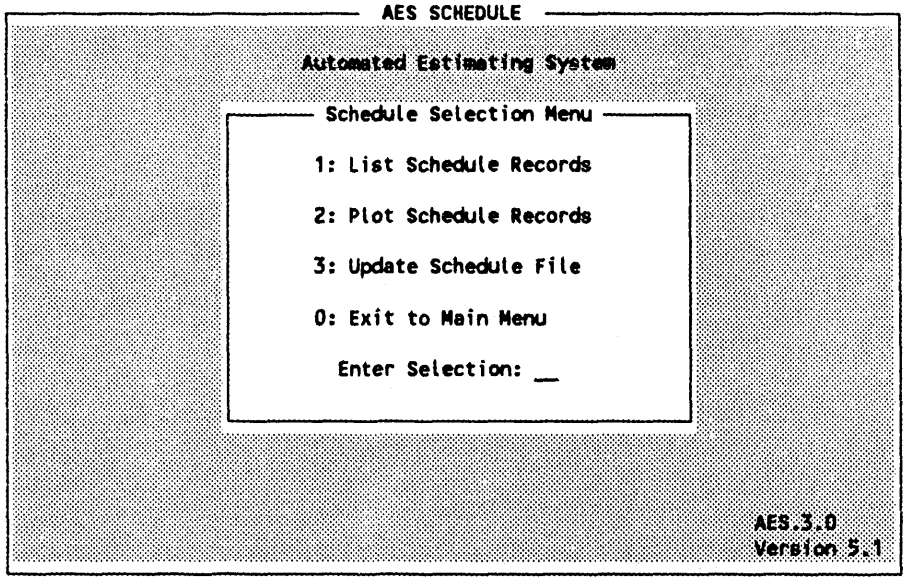
If the schedule file does not exist, the following prompt is displayed:

Schedule Field does not exist, Do you wish to create? [Y/N]: _

Enter the appropriate response. If N is entered, the system returns to the schedule file name prompt. If Y is entered, the system creates two files: an index file and a data file. The index file has the file extension .NDX. It contains the WBS and participant codes that will be used as look-up keys for the schedule data. The data file has the extension .SCH and contains starting fiscal year and quarter and the duration in quarters for a given WBS and participant code.

After the schedule file name is entered, the Create/Update Schedule screen (AES.3.0) shown below, is displayed.

Schedule Selection Menu (AES.3.0)

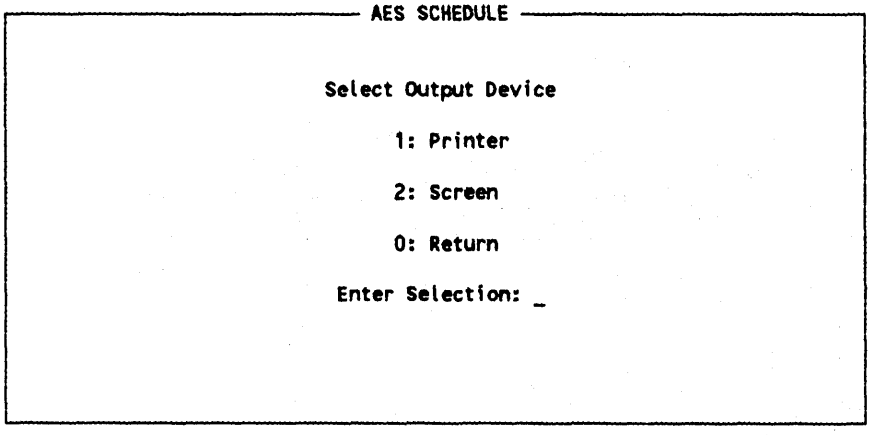


The Schedule Selection Menu displays the options that are available. To select an option, press the desired option number and then RETURN. The system responds with prompts and screens to define the information necessary to perform the selected option.

The options from this menu are discussed in detail in the following sections.

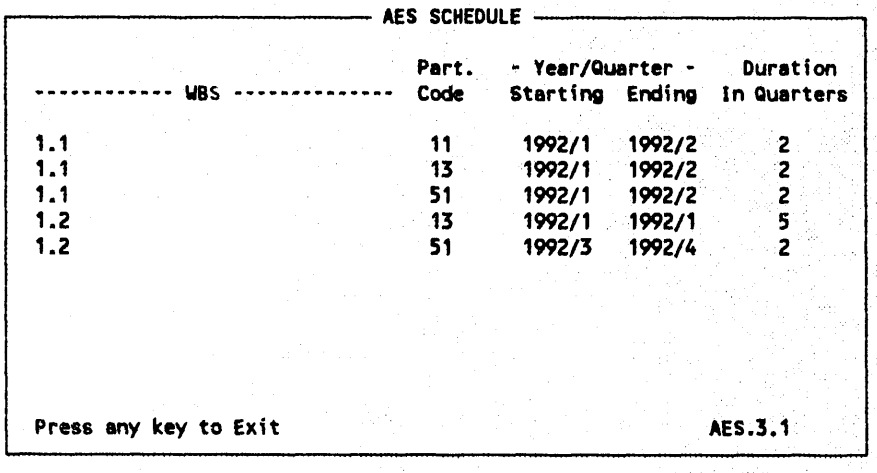
6.1 LIST SCHEDULE RECORDS

Option 1, List Schedule Records, lists WBS, participant code, starting year, starting quarter, and duration in quarters for each schedule record contained in the schedule file. The system allows the schedule records to be listed on the screen or allows the listing to be sent to a printer.



Select the output device by entering the number of the listed option. If option 2 is selected, the output is displayed on the screen in the following format:

List Schedule Records (AES.3.1)



Up to 14 records can be displayed on the screen at one time. If the schedule file contains more than 14 records, the message

Press any key to continue

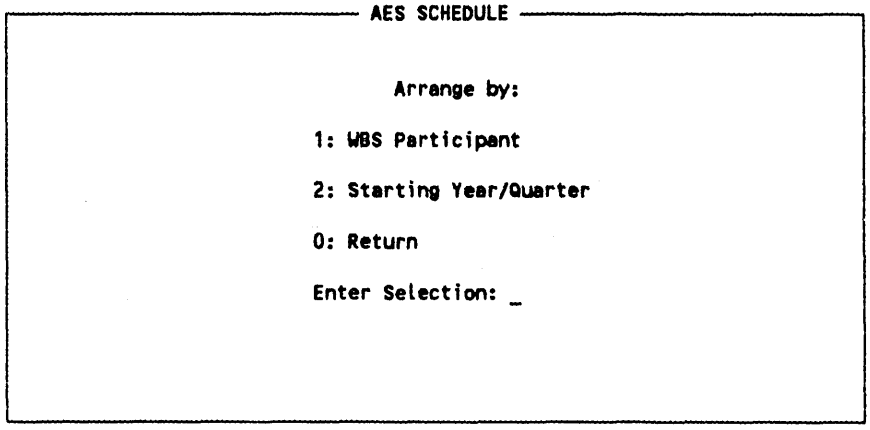
appears at the bottom of the screen. After a key is pressed, the next group of schedule records is displayed on the screen. When all schedule records have been displayed, the message

Press any key to Exit

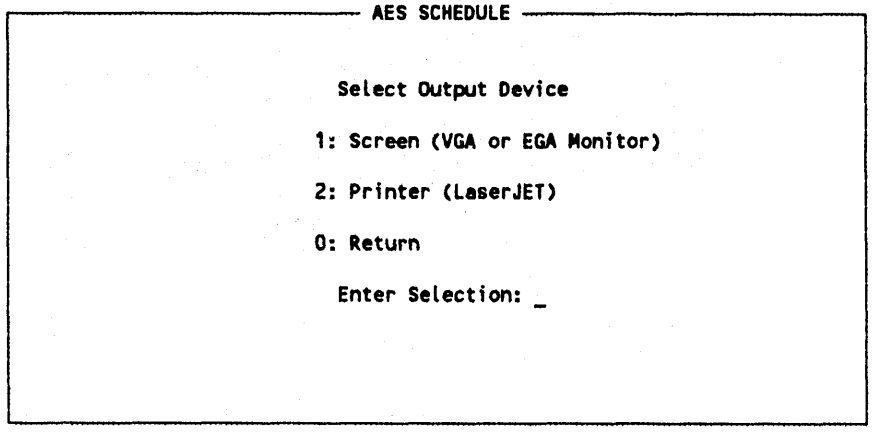
appears at the bottom of the screen. After a key is pressed, the system will return to the Schedule Selection Menu (AES.3.0).

6.2 PLOT SCHEDULE RECORDS

Option 2, Plot Schedule Records, plots each schedule record contained in the schedule file by WBS participant code or starting year/quarter. The system displays the plot on the screen or sends the plot to a printer. The arrangement of the plot is entered on the following screen:



Enter the desired option and press RETURN. Use the following screen to select the output device for displaying the plot:



Enter the option number of the device and press RETURN. If the plot is displayed on the screen, you can press any key to exit the display and return to the main menu. If the plot is sent to the printer, the main menu is displayed automatically after the file is transferred to the printer.

The next page displays an example of the plot format used for both of these options.

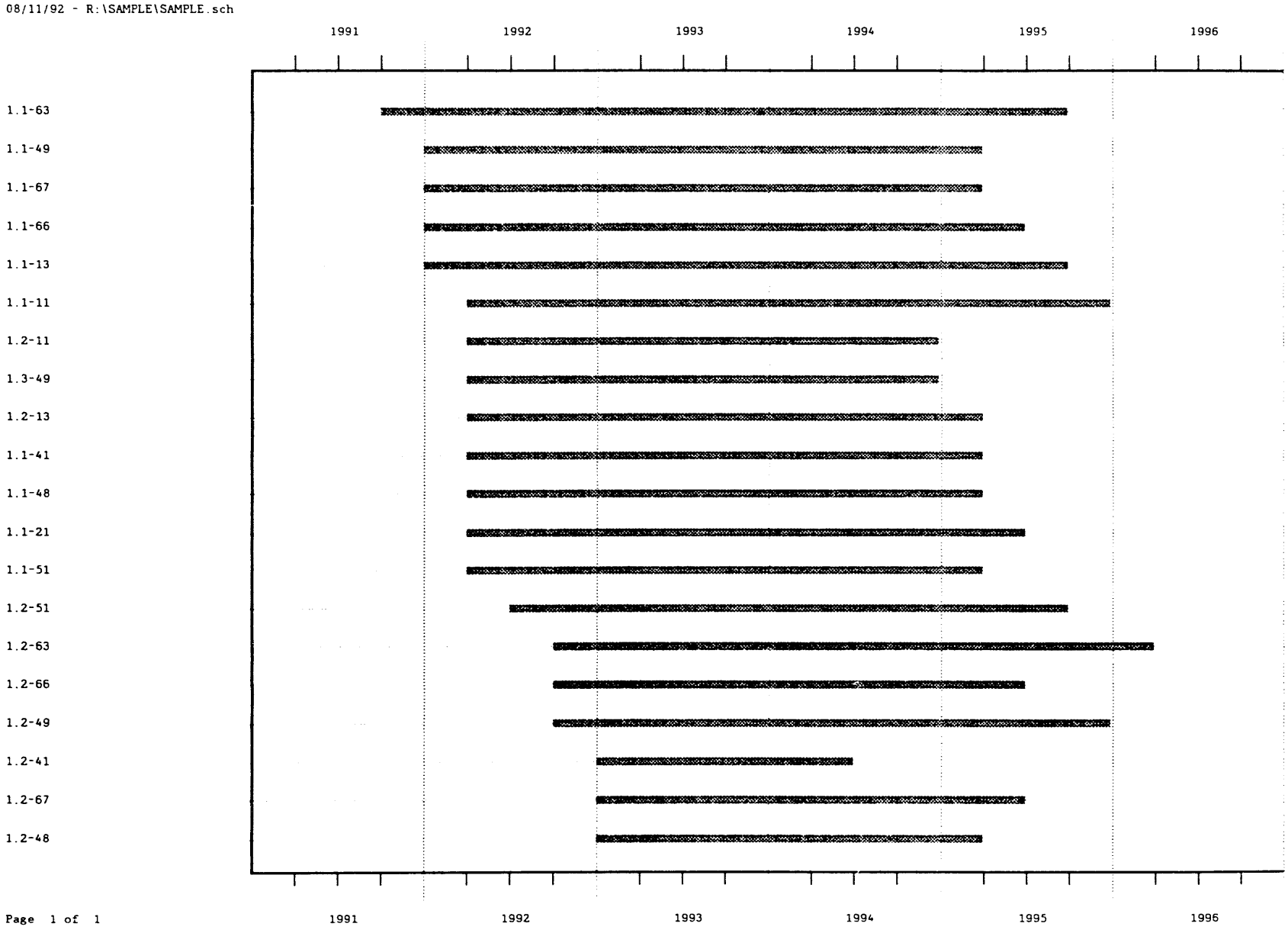
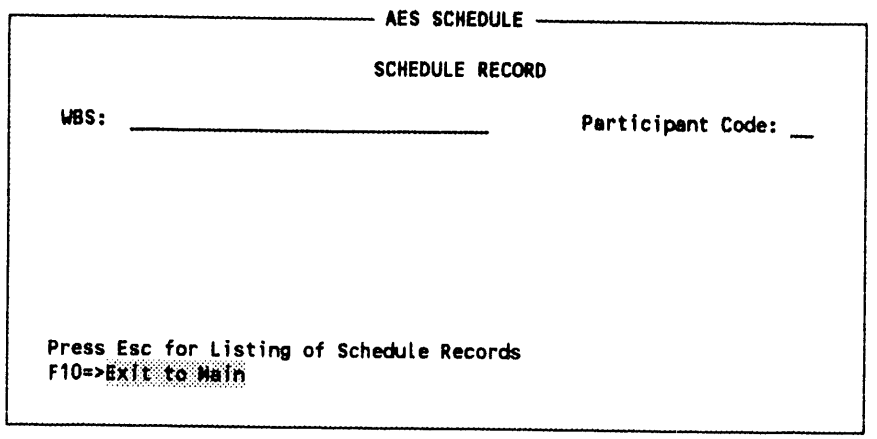


Fig. 6. Plot Format Example.

6.3 UPDATE SCHEDULE FILE

Option 3, Update Schedule File, allows schedule records to be added, deleted, and/or modified. The system displays the WBS and Participant Code prompts shown below. Press function key F10 if you wish to return to the Schedule Selection Menu (AES.3.0).



If the WBS entered has an invalid format, the system issues the error message

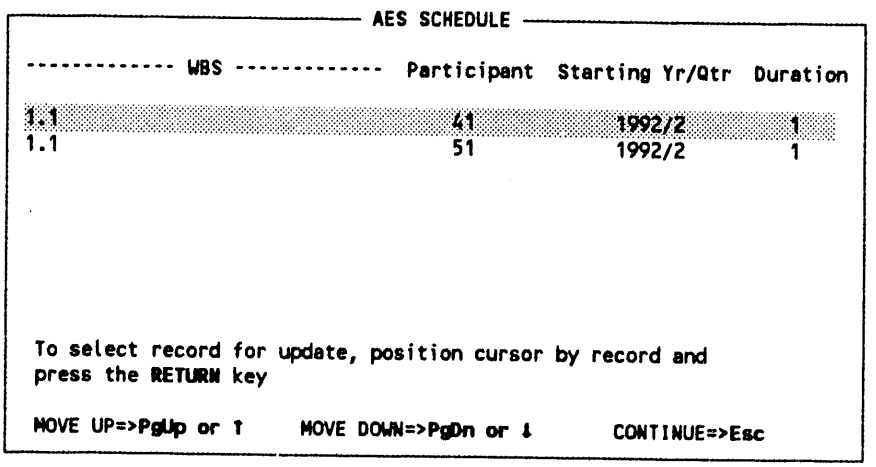
ERROR!! WBS has invalid format!

and places the cursor on the WBS field for correct entry. After entering the WBS correctly, enter the participant code that is being scheduled. If an invalid participant code is entered, the system issues the error message

ERROR!! Invalid Participant Code

and places the cursor on the participant code field again for another entry.

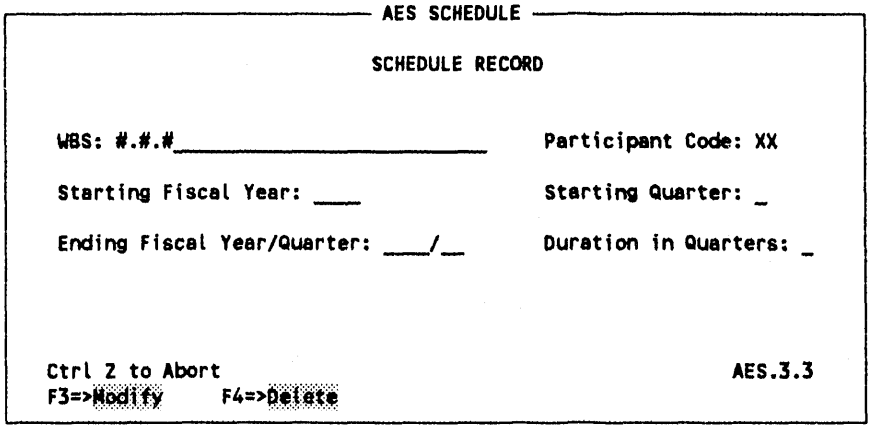
Press the ESC key to display a listing of the schedules records that currently exist.



The PAGE-UP, UP-ARROW, PAGE-DOWN, and DOWN-ARROW keys are used to move the cursor next to the schedule record to be selected for update. The RETURN key can be used to select a record for updating. Press the ESC key to return to the WBS and participant code prompts.

When both WBS and participant code have been entered correctly, the following screen is displayed.

Update Schedule Records (AES.3.3)



The WBS entered is represented by #.#.#, and XX represents the participant code entered. The system determines if a schedule record exists for the combination of the WBS and participant code.

6.3.1 Add Schedule Record

If a schedule record does not exist, F2=>Add is displayed in the bottom left-hand corner of the screen, and the system will allow the schedule to be entered. The Starting Fiscal Year and Starting Quarter are required fields. Either Ending Fiscal Year/Quarter or Duration in Quarters must be entered, but not both. If Ending Fiscal Year/Quarter is entered, the system calculates Duration in Quarters. Likewise, if Duration in Quarters is entered, the system calculates Ending Fiscal Year/Quarter. Duration in Quarters cannot exceed 160 quarters, and Ending Fiscal Year/Quarter cannot be less than Starting Fiscal Year and Quarter. After the schedule data have been entered, press function key F2 to add the record. If CTRL Z is pressed, the system aborts execution, and the record is not added. Press F2 or CTRL Z to clear the screen and return to the WBS and Participant Code prompts.

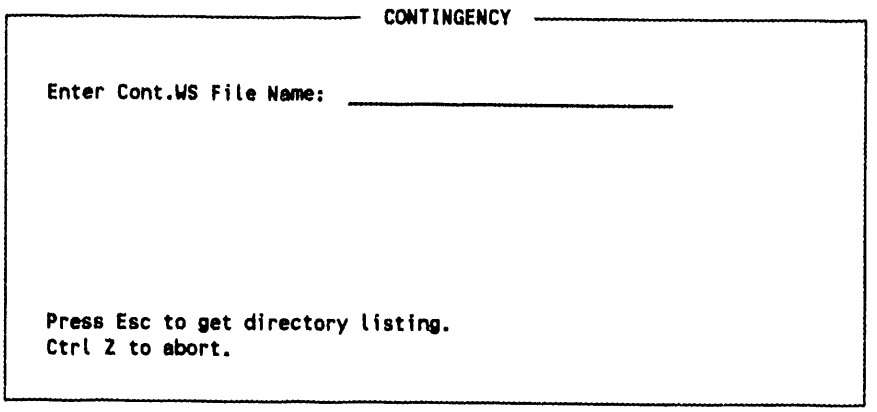
6.3.2 Modify or Delete Schedule Record

If a schedule record is found for the WBS/participant code, the system displays the schedule information on the screen, and F3=>Modify and F4=>Delete appear in the bottom left-hand corner of the screen.

If the schedule record is to be modified, the RETURN key and the TAB keys allow the cursor to be moved to the field(s) to be changed. When all changes have been made, press function key F3 to modify the record. To delete a schedule record, press function key F4. Press CTRL Z to abort any modification to the schedule record. Press F3, F4, or CTRL Z to clear the screen and return to the WBS and Participant Code prompts.

7.0 CONTINGENCY ANALYSIS

When option 4 is selected from the Main Menu, the following prompts are displayed to identify the contingency (WS) and estimate file names to be used for performing the contingency analysis.

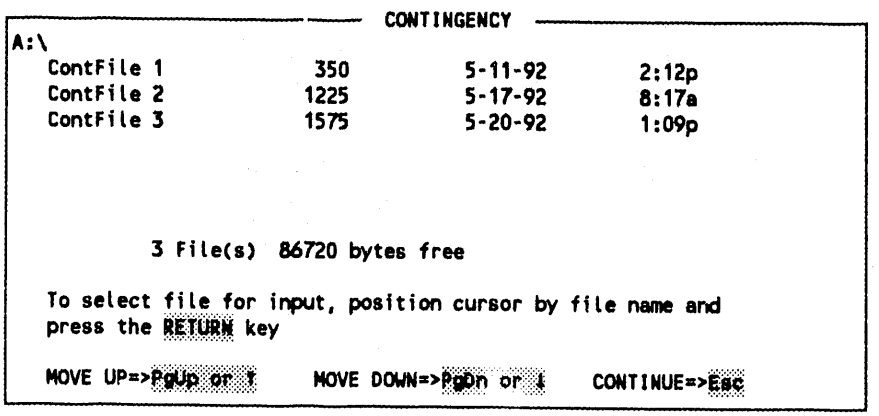


Enter the desired contingency file name and press RETURN. If the contingency file does not exist, the following prompt is displayed:

Contingency File does not exist, Do you wish to create? [Y/N]: _

Enter the appropriate response. If N is entered, the system returns to the contingency file name prompt. If Y is entered, the system creates two files: an index file and a data file. The index file has the extension .CDX. It contains the WBS, participant group, and cost code that will be used as look-up keys for the contingency data. The data file has the extension of .CNT and contains the contingency midpoint, completeness of design, and degree of difficulty that are used to calculate the percentage of contingency.

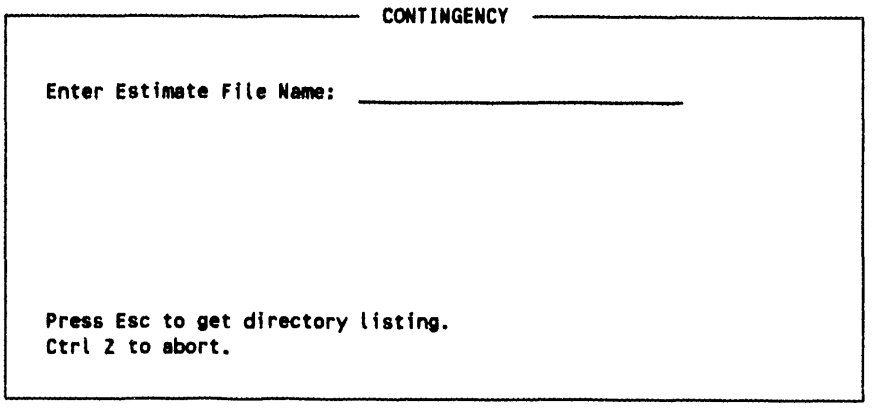
The contingency file name can also be selected from the directory listing. Press the ESC key to produce the directory listing of contingency files.



The PAGE-UP, UP-ARROW, PAGE-DOWN, and DOWN-ARROW keys are used to move the cursor next to the contingency file name to be selected for input. After positioning the cursor by the appropriate

file name, press the RETURN key to mark this file for input. An asterisk (*) appears by the file name selected. Press the ESC key to return to the file name prompt. The contingency file name selected will be displayed. Press the RETURN key to continue.

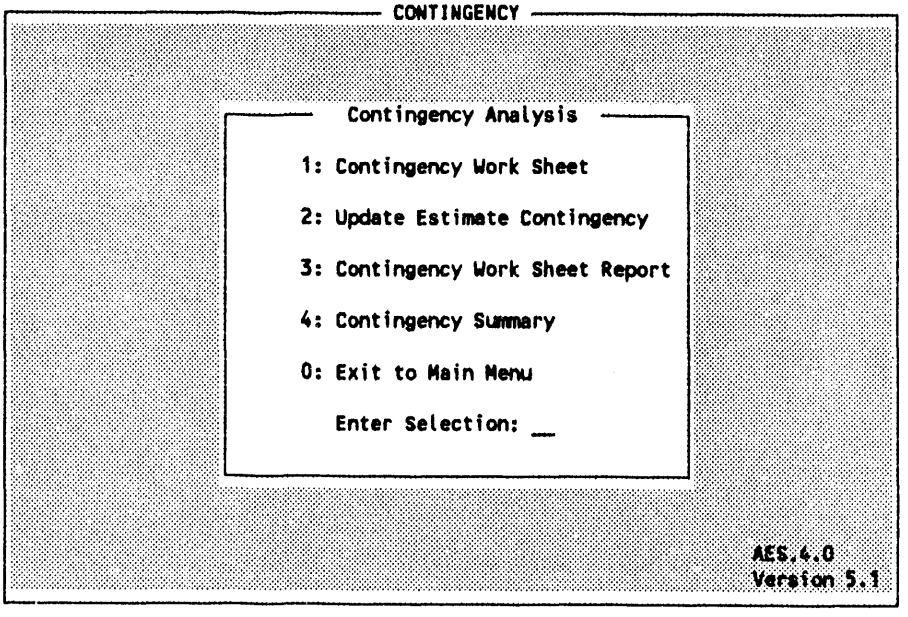
After a valid contingency file name has been entered, the system displays the prompt for an estimate file name:



Type an estimate file name (DO NOT INCLUDE A FILE EXTENSION). The file name may be selected from the directory listing in the same manner as described above for the contingency file name.

After the estimate file name and contingency (WS) file name are entered, the Contingency Analysis Menu (AES.4.0) is displayed. This menu allows you to enter/update contingency information in the data base and to obtain a summary contingency listing.

Contingency Analysis Menu (AES.4.0)

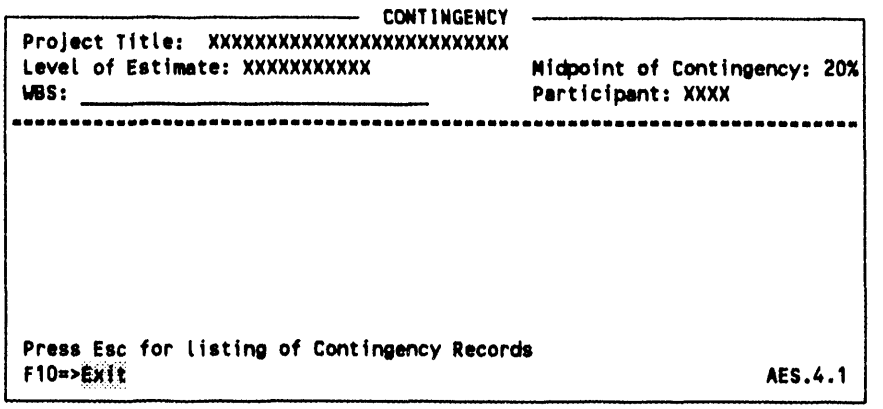


Enter either options 1, 2, 3, or 4 from this menu and press RETURN. These options are explained in the following manual sections.

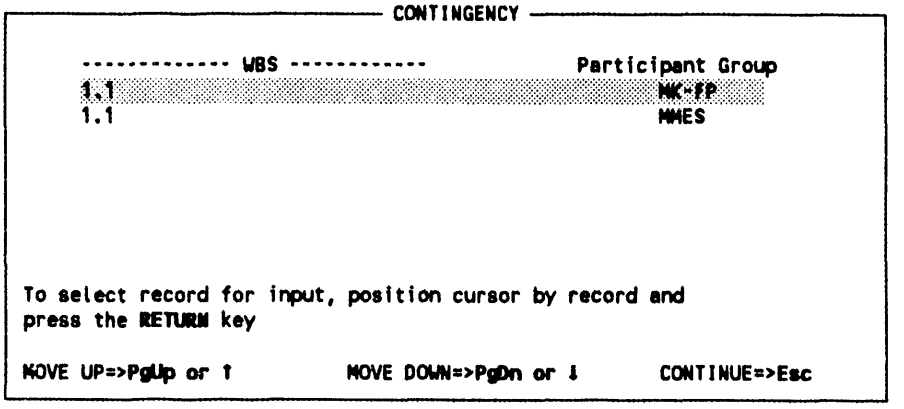
7.1 CONTINGENCY WORK SHEET

When option 1 is selected from the Contingency Analysis Menu, the following contingency information screen is displayed:

Contingency Work Sheet (AES.4.1)



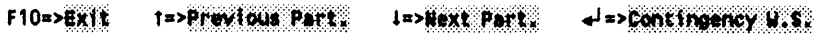
The cursor is initially placed on the WBS field of this screen. Enter the WBS number and press RETURN. If necessary, you may press ESC for a listing of Contingency records similar to the following:



The PAGE-UP, UP-ARROW, PAGE-DOWN, and DOWN-ARROW keys are used to move the cursor next to the contingency record to be selected. The RETURN key can be used to select a record for updating. Press the ESC key to return to the WBS code prompt.

Depending on the Level of Estimate that was entered for this WBS, the Midpoint of Contingency field will be calculated by the system. If the Level of Estimate is Engineering, the cursor will be placed on this field, and you will be allowed to specify the percentage amount.

The cursor is next placed on the Participant field, and the following options to select this information are displayed at the bottom of the screen:



When the UP- or DOWN-ARROW keys are pressed, valid participant codes scroll into view in the Participant field. Scroll to the desired participant code, and then press the RETURN (↵) key. The contingency work sheet will be displayed on the bottom of this screen as shown below:

```
------------------------------ CONTINGENCY ------------------------------
Project Title:  XXXXXXXXXXXXXXXXXXXXXXXXXX
Level of Estimate: XXXXXXXXXXX            Midpoint of Contingency: 20%
WBS: ______________________________       Participant: XXXX
=========================================================================
         Project            Contingency  Completeness  Degree of  Contingency
         Element             Midpoint     of Design    Difficulty     %

LAND AND LAND RIGHTS           20%    X     _.__    X   _.__    =   __._%
IMPROVEMENT TO LAND            20%    X     _.__    X   _.__    =   __._%
NEW BUILDINGS AND ADDITIONS    20%    X     _.__    X   _.__    =   __._%
BUILDING MODIFICATIONS         20%    X     _.__    X   _.__    =   __._%
OTHER STRUCTURE                20%    X     _.__    X   _.__    =   __._%
SPECIAL FACILITIES             20%    X     _.__    X   _.__    =   __._%
UTILITIES                      20%    X     _.__    X   _.__    =   __._%
STANDARD EQUIPMENT             20%    X     _.__    X   _.__    =   __._%
CONST MGMT./SUPPORT SERVICES   20%    X     _.__    X   _.__    =   __._%
ENGINEERING                    20%    X     _.__    X   _.__    =   __._%


Ctrl Z to Abort                                                 AES.4.1
F3=>Update        F4=>Delete      PgDn=>Next Screen      PgUp=>Prev. Screen
```

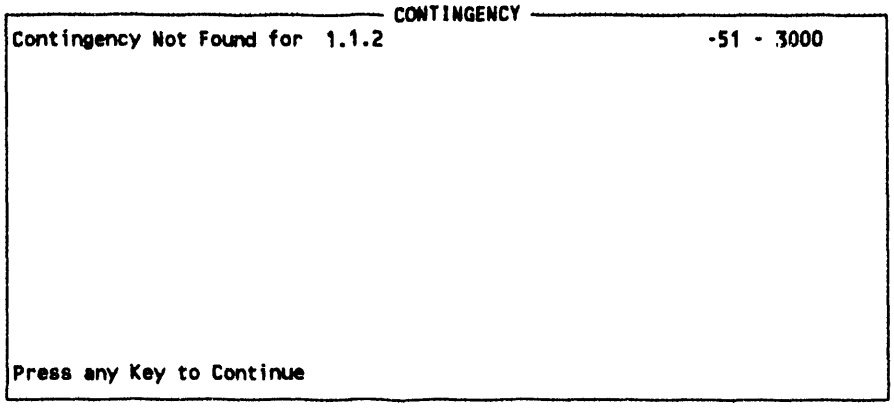
The TAB, ARROW, and RETURN keys can be used to position the cursor in the fields that require data entry/update. Use the PAGE-DOWN and PAGE-UP keys to view additional project elements if there are more than are displayed on this screen.

The Completeness of Design and Degree of Difficulty columns allow you to enter data; Contingency % is calculated automatically by the system. If this record is being updated, you may change the displayed values, and the system will automatically recalculate and display the change in Contingency % and save the updates to the database. The lower part of the screen will be cleared, and the cursor will be returned to the WBS field.

If this record is to be deleted, press F4=>Delete; the record will be deleted, and the cursor will be returned to the WBS field. You can continue updating contingency for a new WBS and/or Participant or press F10 to return to the Contingency Analysis Menu.

7.2 UPDATE ESTIMATE CONTINGENCY

Option 2 on the Contingency Analysis Menu updates the contingency percentage for the currently selected Estimate file based on the information in the current Contingency WorkSheet file. After updating the contingency percentages, if records are found in the Estimate file that do not have contingency records associated with them, they are displayed on the screen as shown below:

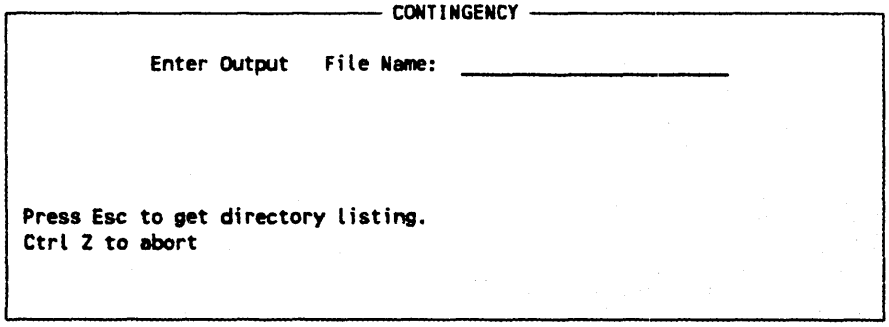


After viewing the displayed list, press any key to return to the Contingency Analysis Menu.

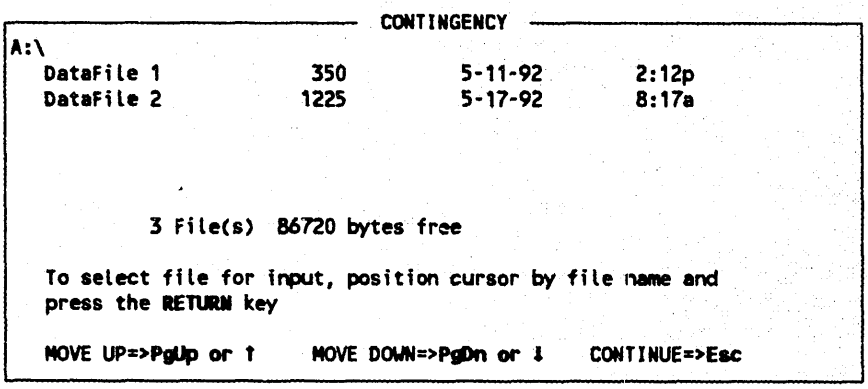
If no records are found to be lacking contingency records, the system automatically updates the contingency percentages and returns to the Contingency Analysis Menu.

7.3 CONTINGENCY WORK SHEET REPORT

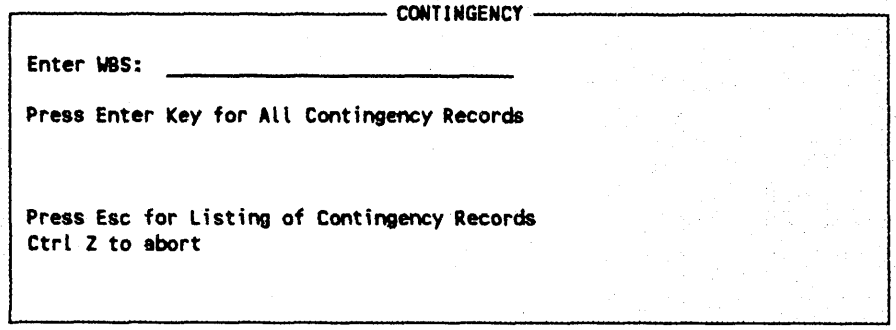
Option 3 on the Contingency Analysis Menu creates a report containing information on the current Contingency file. The following prompt is displayed to allow you to enter the name under which to save this file.



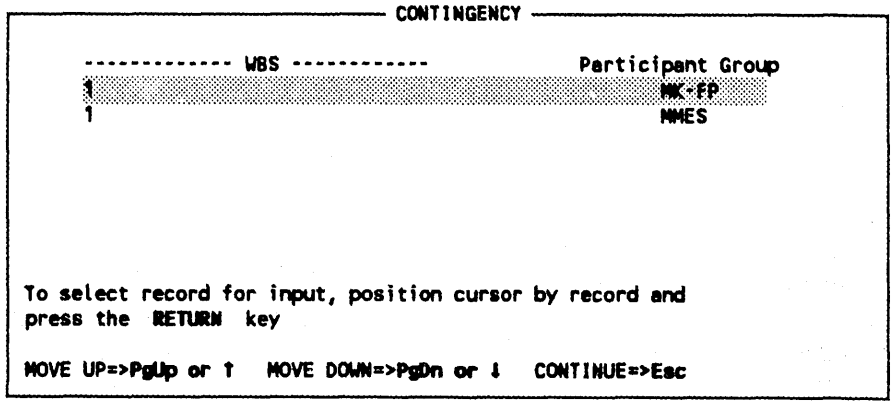
Enter an output file name, either a new file name or one that you wish to replace, and press RETURN. To check the directory listing of existing names, press ESC; the following screen is displayed:



The PAGE-UP, UP-ARROW, PAGE-DOWN, and DOWN-ARROW keys are used to move the cursor next to a report file name. Press the RETURN key to mark this file; an asterisk (*) appears by the file name selected. Press the ESC key to return to the file name prompt, where the report file name selected will be displayed. Press the RETURN key to continue to the WBS prompt:

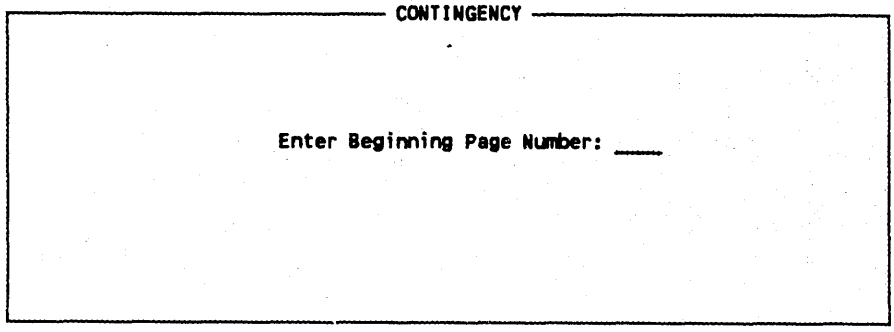


Enter a specific WBS number at this prompt or press RETURN to include all contingency records. If you need to view a list of all WBS numbers, press ESC to see the following screen:



Select a record from this listing in the same manner as described on the previous page, and then press ESC to continue.

The next prompt allows you to enter a beginning page number for the report, if the page numbering is a continuation of another printout.



Pressing the Return key at this prompt without entering a page number causes the report to begin on page 1, which is the default value. At the completion of this prompt, the message:

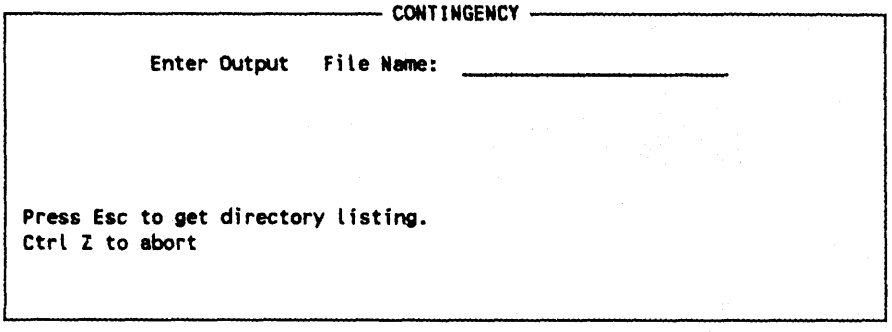
Producing Contingency Work Sheet Report

is displayed, and then the Contingency Analysis Menu is displayed.

7.4 CONTINGENCY SUMMARY

When option 4, Contingency Summary, is selected from the Contingency Analysis menu, a contingency summary report is written to a file that can be viewed using the AES Report Browse function (option 11) on the Report Menu.

An output file name prompt is displayed to request this report:

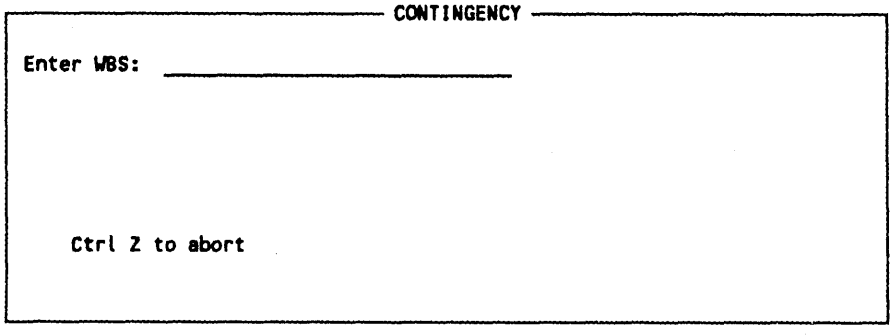


Type in the requested file name, using the directory listing as a guide to the report files that exist in the data base. (Use of the directory listing screen is described at the beginning of Sect. 7.0.) Type a file name for the report output (DO NOT TYPE AN EXTENSION). If the file name already exists for a summary report, the following message is displayed:

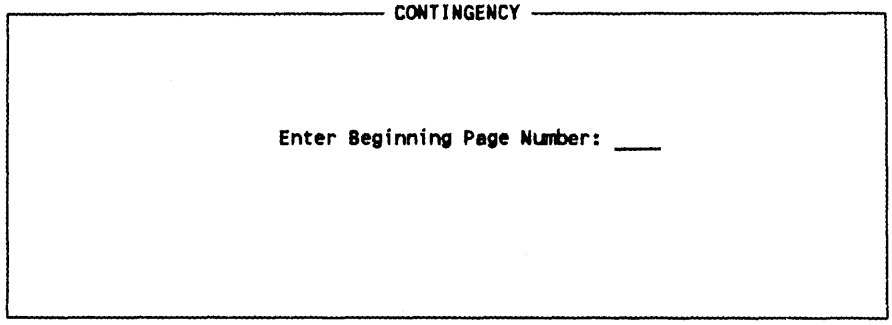
ERROR!! Output File Already Exists.
Do you wish to Overwrite? [Y/N]: _

If the existing file is not to be overwritten, the output file name prompt will be redisplayed so that a new file name can be entered at this prompt.

The next prompt for producing this report requests the WBS number:



When a valid WBS number is entered, the page number prompt is displayed:



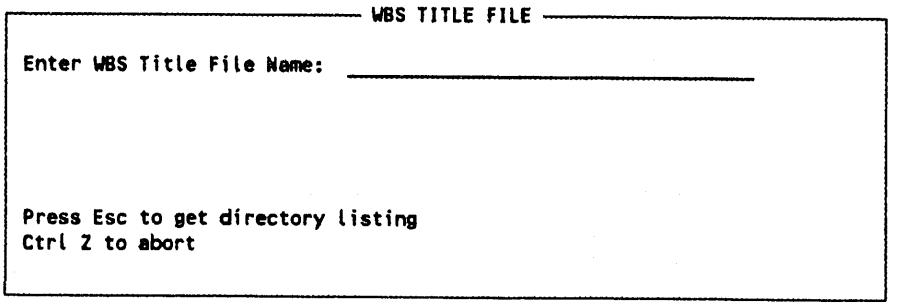
Enter a page number, or press RETURN to accept the default of page 1. The following message will be displayed:

Producing Contingency Summary

and you will be returned to the Contingency Analysis Menu.

8.0 UPDATE WBS TITLE FILE

Option 5 on the Main Menu allows you to update the WBS Title File. The following screen is displayed and prompts for a WBS Title file name.



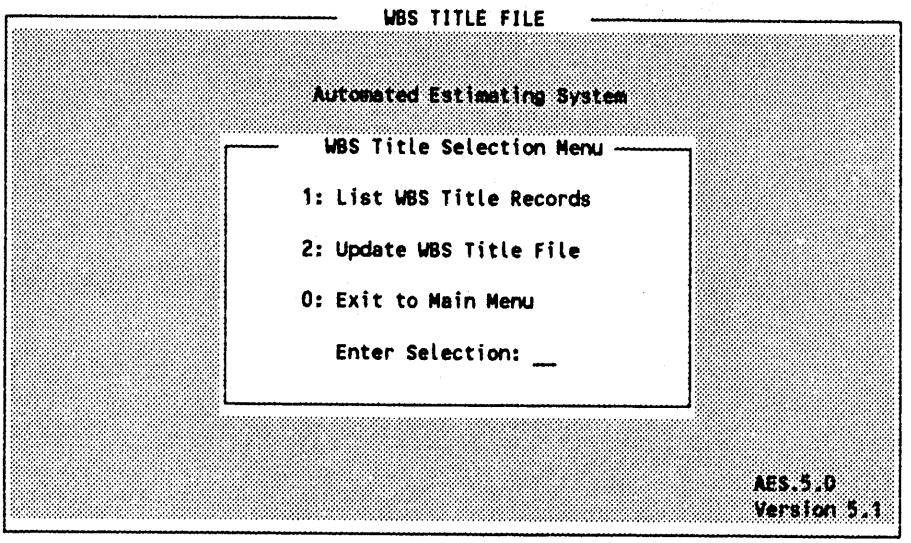
Enter a WBS Title file name and press RETURN. Do not enter an extension to the filename; this is assigned by the system. If the WBS Title file entered does not exist, the following prompt is displayed:

WBS Title File does not exist, Do you wish to create? [Y/N]: _

Enter the appropriate response. If N is entered, the system returns to the WBS Title file name prompt. If Y is entered, the system creates two files: an index file and a data file. The index file has the file extension of .IDX. It contains the WBS codes that will be used as look-up keys for the WBS titles. The data file has the extension of .WBS and contains the WBS code and the corresponding WBS title.

After the WBS Title file name is entered, the WBS Title File Menu screen (AES.5.0) shown below is displayed.

WBS Title File Menu (AES.5.0)



Enter a selection number and press RETURN. These options are discussed in the next two sections of this manual.

8.1 LIST WBS TITLE RECORDS

Option 1, List WBS Title Records, lists the WBS codes and titles for each record contained in the WBS Title file. The system allows a list of WBS Title records to be listed on the screen or to be sent to a printer. Selection of an output device is made using the following screen:

```
WBS TITLE FILE

Select Output Device

     1: Printer

     2: Screen

     0: Return

Enter Selection: _
```

Select the output device number and press RETURN. If option 1 is selected, the system sends the list to a printer and returns you to the WBS Title File Menu. If option 2 is selected, the system displays the listing on the WBS Title List screen (AES.5.1), as shown below:

WBS Title List (AES.5.1)

```
WBS TITLE FILE

------ WBS ------          ------------ Title ------------

1.1                       PROJECT INTEGRATION
1.1.1                     WET CHEMISTRY
1.1.1.1                   DISSOLVER/BURNER PEM
1.1.1.1.2                 PROJECT INTEGRATION
1.1.1.2                   HDO TREATMENT PE,
1.1.1.3                   EVAPORATOR
1.1.1.4                   PCS HARDWARE
1.1.1.5                   PCS SOFTWARE
1.1.1.6                   INSTALLATION
1.1.1.7                   DEMOLITION
1.1.2.1                   MMES TITLE III
1.1.2.2                   A-E TITLE III
1.1.2.3                   A-E SUPPORT

Press any key to Exit                                AES.5.1
```

Up to 14 records can be displayed on the screen at one time. If the WBS Title file contains more than 14 records, the following message is displayed at the bottom of the screen.

Press any key to Continue

After pressing a key, the next group of WBS Title records is displayed on the screen. When all WBS title records have been displayed, the following message is displayed at the bottom of the screen.

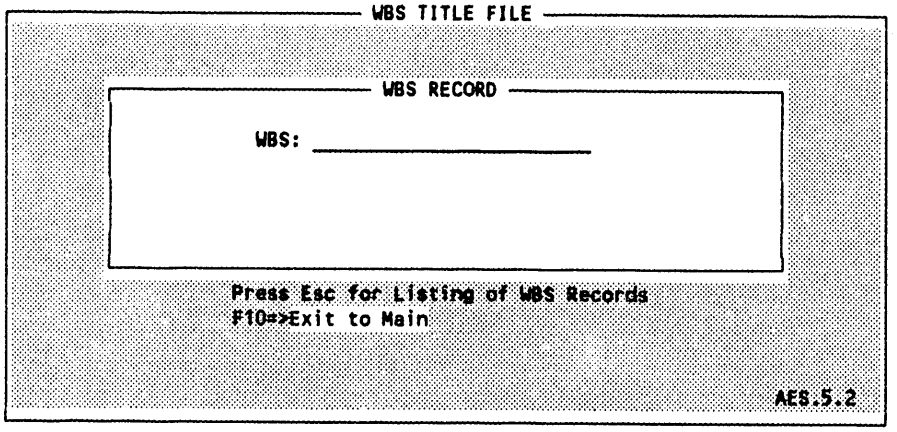
Press any key to Exit

When any key is pressed, the system returns to the WBS Title File Menu.

8.2 UPDATE WBS TITLE FILE

Option 2 on the WBS Title File Menu allows WBS Title records to be added, deleted, and/or modified. The WBS Title Update screen (AES.5.2) shown below allows input of a WBS number:

WBS Title Update (AES.5.2)

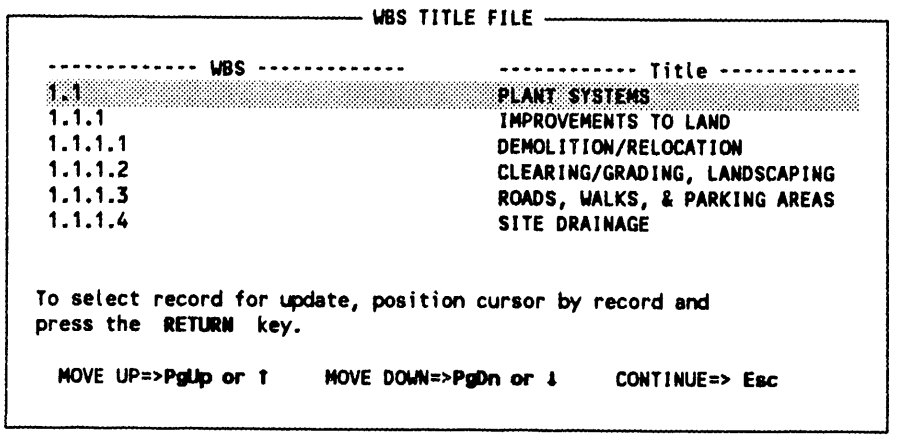


Enter the WBS number for the record to be updated/created and press RETURN. If the WBS code entered has an invalid format, the system issues the error message

ERROR!! WBS has invalid format!

and places the cursor on the WBS code prompt for correct entry. If the number entered is valid, the system continues with the add or update as described in Sects. 8.2.1 and 8.2.2.

If the valid WBS number is not known, press the ESC key to display a listing of the WBS Title records that currently exist. This list is displayed in the following format:

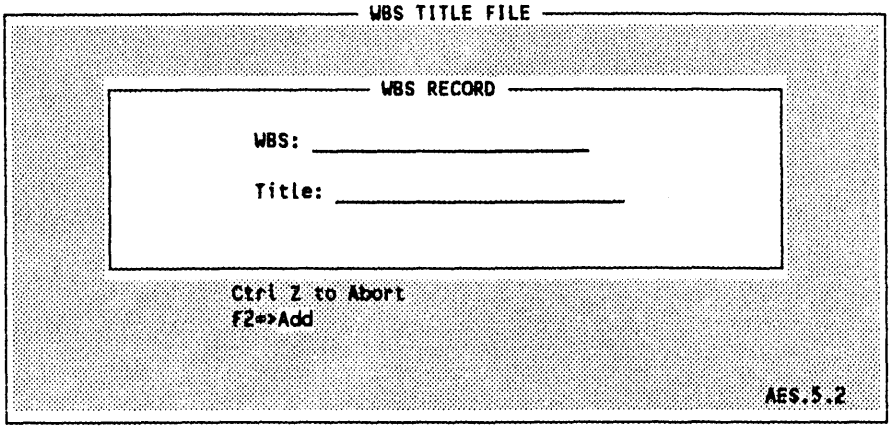


Use the PAGE-UP and PAGE-DOWN keys to display the additional pages of WBS data. This list may be used to verify a valid number to be added or select a valid number to update. When the number to be updated is located, use the UP-ARROW and DOWN-ARROW to move the cursor next to the WBS Title record and press RETURN. Then, press the ESC key to return to the WBS Title Update screen.

8.2.1 Add WBS Title Record

If a WBS Title record for the number entered in the WBS code prompt does not exist, the system will display the number with a blank Title field on the WBS Title Update screen, and F2=>Add will be displayed on the bottom of the screen, as shown below.

WBS Title Update (AES.5.2)



Enter a WBS title for the displayed number and press RETURN to add the record. If CTRL Z is pressed, the system aborts the addition of the record and displays a blank WBS code prompt on the screen.

8.2.2 Modify or Delete WBS Title Record

If a WBS Title record is found for the WBS number entered in the WBS prompt on the Title Update screen, the system displays the existing title on the above screen, but F3=>Modify and F4=>Delete appear on the screen instead of F2=>Add. If the WBS Title record is to be modified, correct the WBS title and press function key F3 to modify the record.

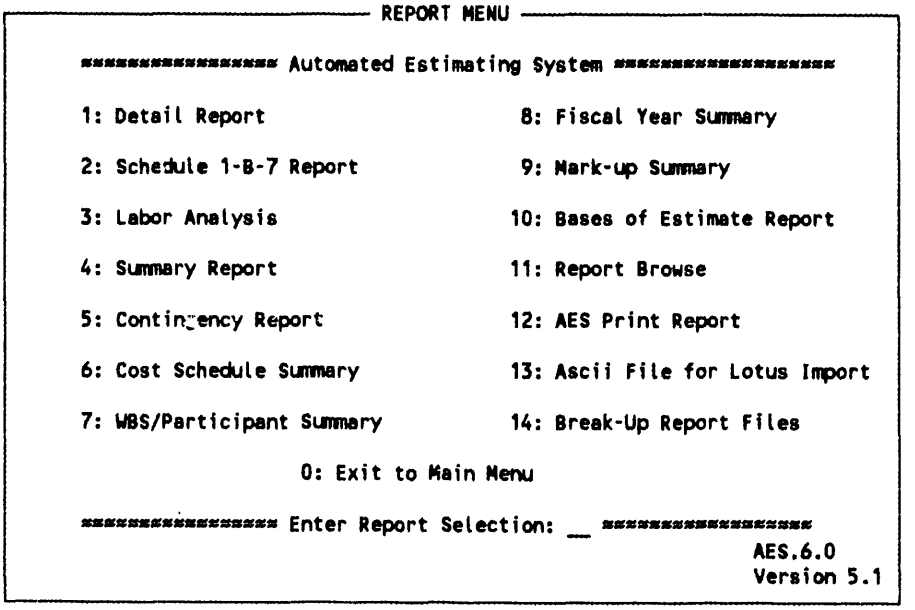
If the WBS Title record is to be deleted, press function key F4.

If Ctrl Z is pressed, the system aborts the modification of the record and displays a blank WBS code prompt on the screen.

9.0 GENERATING REPORTS

When option 6 is selected from the Main Menu, the Report Menu (AES.6.0) shown below is displayed. Options on this screen allow the generation of standard and nonstandard reports to a disk file. The disk file can be sent to a printer or viewed on the screen using the Report Browse option (option 11) on the Report Menu.

Report Menu (AES.6.0)



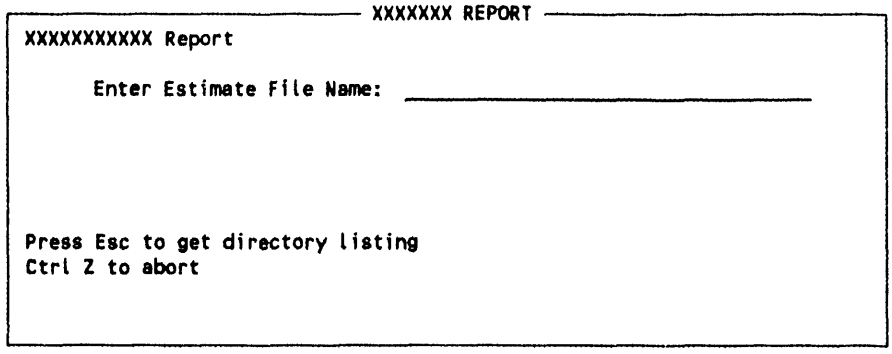
Enter the report selection number and press RETURN to begin the report selection process. The system will display a series of screens requesting the estimate file name, output file name, schedule file name, beginning page number, sort arrangement, and specific participant, discipline, or WBS level for which the report will be generated. All report selections from this menu except the Schedule 1-B-7, Cost Schedule Summary, and WBS/Participant Summary allow you to select a sort arrangement for the report.

The prompts and screens used to supply this standard information for the reports are described in the following text. A description of the standard information required for each report and prompts for information specific to individual reports are described for each report in Sects. 9.1 through 9.12.

One or more reports may be generated by selecting the desired option(s) and responding to the prompts. This procedure should be repeated until all desired reports have been generated. Option 0 of the Report Menu returns you to the Main Menu.

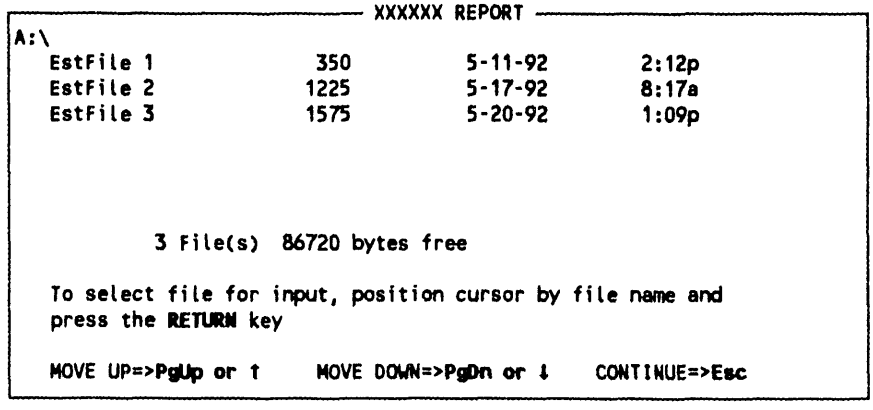
Estimate File Name Prompt

Each report selection requests the estimate file to be used for the report:



Enter the filename and press RETURN. If the estimate file entered does not exist, the system issues a warning and prompts again for an estimate file name.

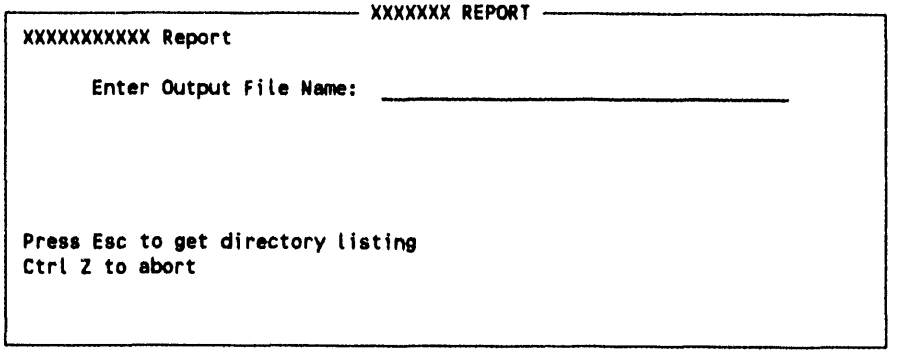
The estimate file name can also be selected from the directory listing. Press the ESC key to produce the directory listing of estimate files.



The PAGE-UP, UP-ARROW, PAGE-DOWN, and DOWN-ARROW keys are used to move the cursor next to the estimate file name to be selected for input. After positioning the cursor by the appropriate file name, press the RETURN key to mark this file for input. An asterisk (*) appears by the file name selected. Press the ESC key to return to the file name prompt. The estimate file name selected is displayed. Press the RETURN key to continue.

Output File Name Prompt

After entering an existing estimate file name, you are prompted for the output file name for the report:



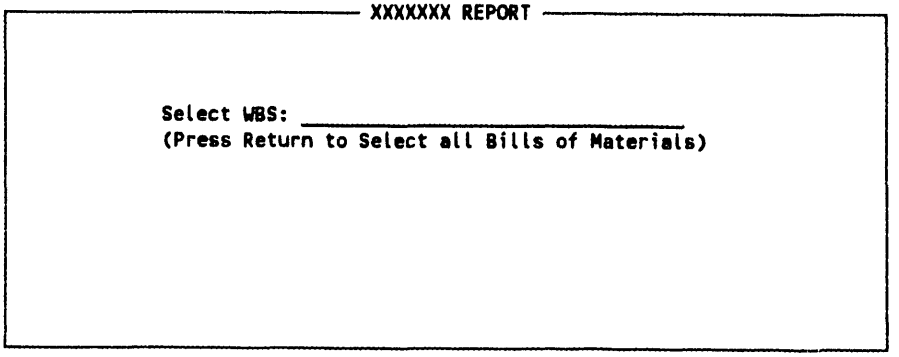
This file name can be up to eight characters long. Do not include a file extension; the system appends the extension .OUT to the file name. If a file already exists with this file name, the system issues the following error message:

ERROR!! Output File Already Exists
Do you wish to overwrite? [Y,N] _.

If you do not wish to overwrite this file, enter N, and the system allows another output file name to be entered. If you enter Y, the system overwrites the existing file with the requested report. The output file directory listing can be viewed and used to select an output file name in the same way as described above for using the estimate directory listing.

WBS Number Prompt

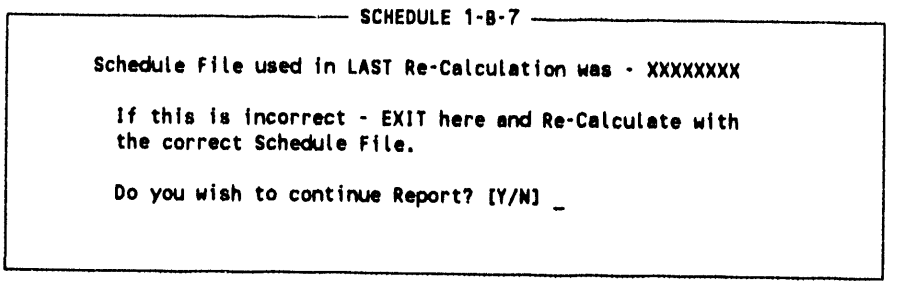
Any report may be generated for a particular WBS. The WBS can be selected using the following prompt:



Enter the WBS for which the report is to be generated, or press Return to include all Bills of Materials.

Schedule File Name Verification Prompt

For most reports, the system verifies the correct schedule file to be used with the following prompt:



If a recalculation needs to be performed, it must be done before the report is generated. If report formulation is attempted without recalculation, a listing of record errors will be generated instead of the report, and the following error message will be displayed at the end of this process:

```
ERROR!! RECORDS FOUND THAT WERE NOT SCHEDULED
    OR RECALCULATE NEEDS TO BE PERFORMED

OUTPUT FILE CONTAINS LISTING OF RECORDS IN ERROR
```

The output file (the file designated to receive the report) can be viewed using the AES Report Browse function (option 11) on the Report Menu to locate the records that are in error. These records are listed by WBS, participant code, and cost code.

Page Number Prompt

Most reports have consecutive page numbering that can begin with whatever page number you specify. This allows you to combine several different reports into one consecutive package. If this option is functional for the selected report the following prompt is displayed:

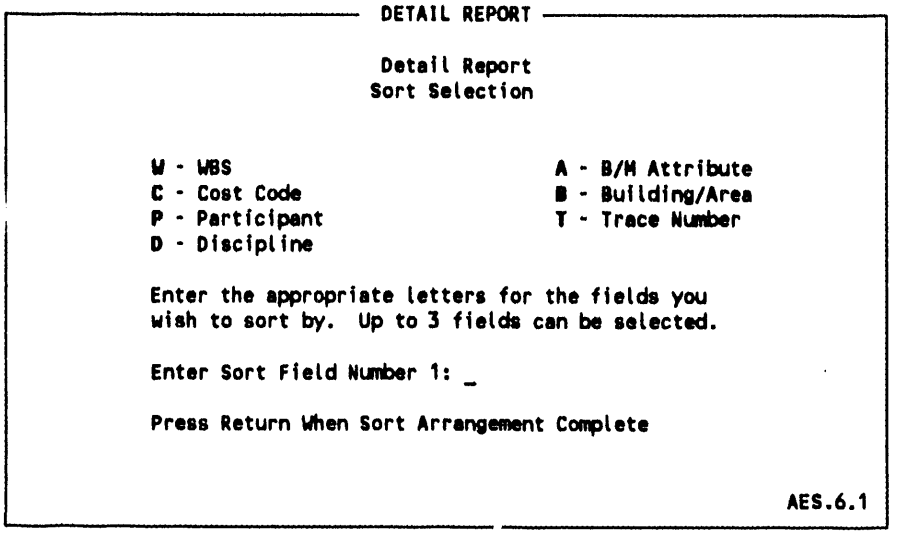
Enter Beginning Page Number: __

Enter the desired page number and press RETURN.

Sort Selection Screen

If the report is to be sorted, the system displays a Report Sort Selection screen, which contains the sort criteria that are used for the report. The sort selection will vary among reports. The following screen is an example of the sort selection for the Detail Report (AES.6.1).

Report Sort Selection Screen (AES.6.1)



Enter the letter of the primary sort field. The system then prompts for the second sort field and then the third. Press the UP-ARROW key to move the cursor back to the previous sort field if it needs to be changed. A maximum of three fields may be used as sort keys. If less than three fields are to be used in sorting, press the RETURN key after the last one has been entered.

In some cases, you must specify the specific participant, discipline, or WBS level for which the sort should select. If this is the case, the prompts

Participant? _ , Discipline? _ , or WBS Level? __

are displayed next to the sort field number selected. After specifying this information, press RETURN to go on to select the next sort field number.

Report Completion Message

After all prompts for the selected report are completed, the system displays the following message on the screen:

PRODUCING XXXXXXXXXXXXXX REPORT

REPORT WILL BE IN FILE:
xxxxxxxx.OUT.

In this message, xxxxxxxx.OUT represents the output file name. When the system has created the report, the Report Menu is displayed. The time period before returning to the Report Menu will vary depending on the size of the estimate file.

9.1 DETAIL REPORT

Selecting option 1 from the Report Menu results in a report being generated that lists all Bill of Material Records and their cost records. This report can be produced in a sorted format if desired by answering Y to the prompt

DO YOU WISH TO SORT REPORT? [Y/N]: N

The report will be sorted in ascending alphanumeric order by up to three fields you select from the Detail Report Selection screen (AES.6.1) shown on the previous page. The available sort fields are shown below.

WBS	B/M Attribute
Cost Code	Building/Area
Participant Code	Trace Number
Discipline	

If no sort is selected, the report follows a standard format.

When the estimate file name, output file name, and beginning page number have been entered, using the prompts described in Sect. 9.0, the following message appears on the screen:

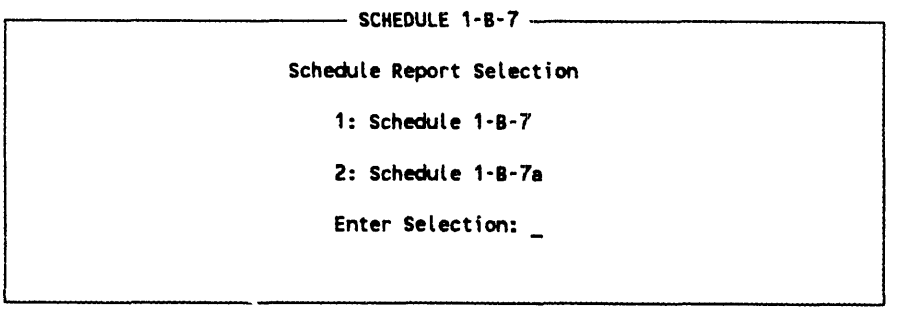
PRODUCING DETAIL REPORT

REPORT WILL BE IN FILE:
xxxxxxxx.OUT.

In this message, xxxxxxxx.OUT represents the output file name. When the system has created the Detail report, the Report Menu is again displayed. The time period before returning to the Report Menu will vary depending on the size of the estimate file.

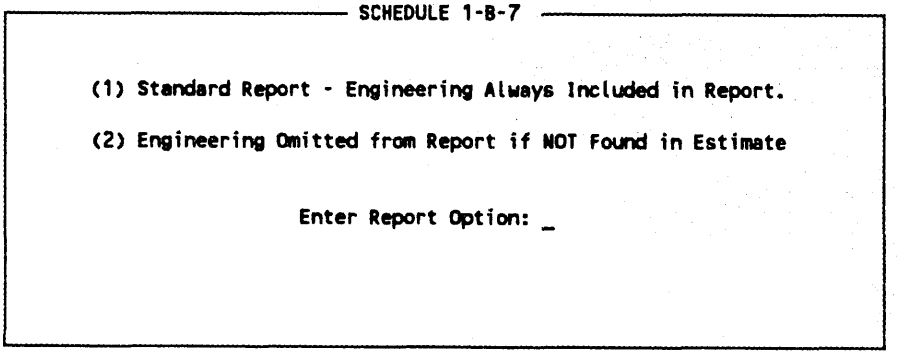
9.2 SCHEDULE 1-B-7 REPORT

Selecting option 2 on the Report Menu results in generation of the Schedule 1-B-7 and Schedule 1-B-7a reports. (Schedule 1-B-7a is an internal report.) Select the report to be generated with the prompt:



The system next prompts for the estimate and output file names and displays the schedule file that will be used for the report for your verification, as described in Sect. 9.0. If a recalculation needs to be performed, it must be done before the report is generated.

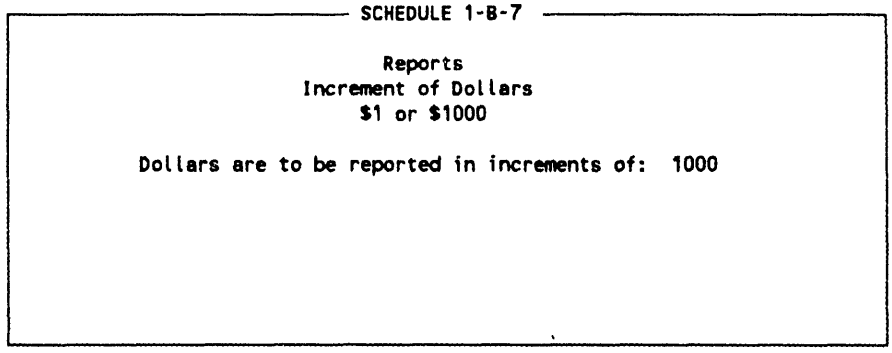
The next prompt allows you to select a standard or nonstandard report, which determines whether or not Engineering data are to be included:



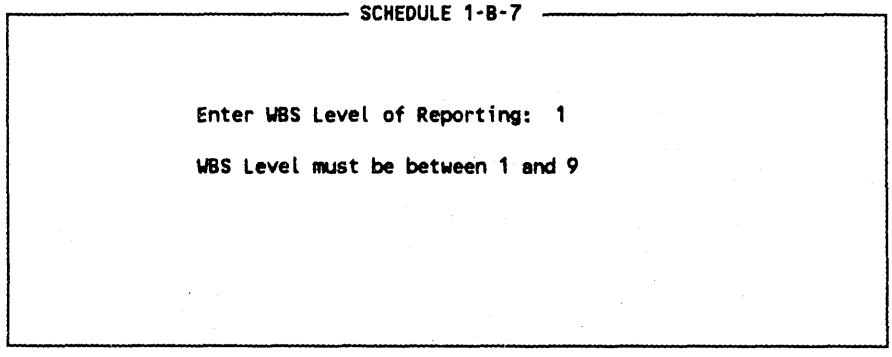
Enter the desired report option.

Prompts, explained in Sect. 9.0, for the beginning page number and for a specific WBS (or for all Bills of Material) are also displayed for this report.

The system next requests the increments in which dollars are to be reported:



Enter either 1 or 1000 for the amount that one dollar should represent in the report and press the RETURN key. The next prompt asks for the Level of Reporting.



Enter the number that indicates the desired WBS level of reporting.

While the report is being generated, the system displays the following message on the screen:

PRODUCING SCHEDULE 1-B-7 REPORT

REPORT WILL BE IN FILE:
xxxxxxxx.OUT.

In this message, xxxxxxxx.OUT represents the output file name. When the system has created the Schedule 1-B-7 report, the Report Menu is again displayed. The time period before returning to the Report Menu will vary depending on the size of the estimate file.

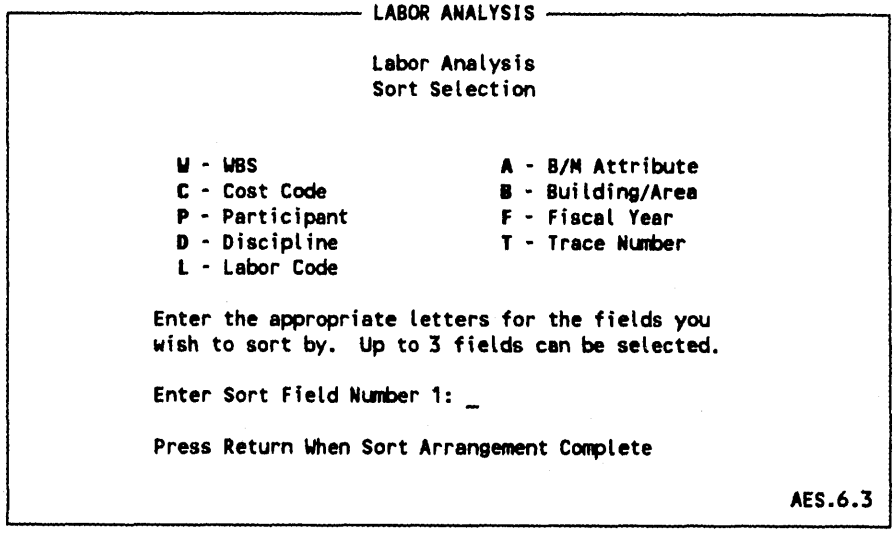
9.3 LABOR ANALYSIS REPORT

Selecting option 3 from the Report Menu results in the generation of the Labor Analysis report. The Labor Analysis report allows labor hours and cost to be arranged by any three of the sort fields displayed on the Labor Analysis Sort Selection Screen (AES.6.3) shown below.

The system first prompts for the estimate and output file names and displays the schedule file that will be used for the report for your verification, as described in Sect. 9.0. If a recalculation needs to be performed, it must be done before the report is generated.

The next prompt allows you to select a specific WBS of all Bills of Material, as described in Sect. 9.0. When these prompts are completed, the system displays the Labor Analysis Sort Selection screen (AES.6.3).

Labor Analysis Sort Selection Screen (AES.6.3)



Enter the letter of the primary sort field. The system then prompts for the second sort field and then the third. Press the UP-ARROW key to move the cursor back to the previous sort field if it needs to be changed. A maximum of three fields may be used as sort keys. If less than three fields are to be used in sorting, press the RETURN key again after the last one has been entered.

Several of the sort fields require additional information if they are selected, and the system prompts you for this information. For example, if Fiscal Year is entered as a sort field, the system prompts for the schedule file name:

Enter Schedule File Name: _____.

If the schedule file entered does not exist, the system issues a warning and prompts again for a schedule file name. Without a schedule file, the Labor Analysis report cannot be generated using Fiscal Year as a sort field.

After the above information is entered, the system prompts for the beginning page number.

You will next receive a prompt for the increments in which dollars are to be reported:

Dollars are to be reported in increments of: _____.

Enter either 1 or 1000 for the amount that one dollar should represent in the Labor Analysis report, and press the RETURN key.

While the report is being generated, the system displays the following message on the screen:

PRODUCING LABOR ANALYSIS REPORT

REPORT WILL BE IN FILE:
xxxxxxxx.OUT.

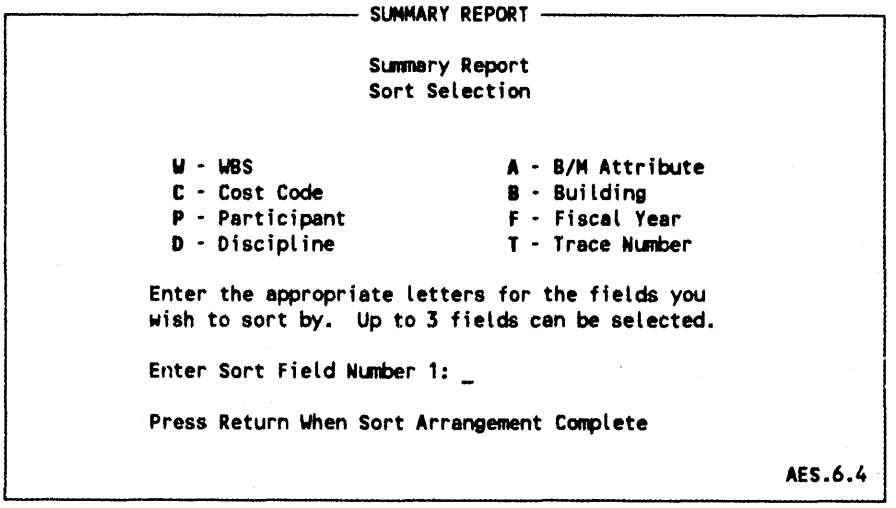
In this message, xxxxxxxx.OUT represents the output file name. When the system has created the report, the Report Menu is again displayed. The time period before returning to the Report Menu will vary depending on the size of the estimate file.

9.4 SUMMARY REPORT

Option 4 from the Report Menu generates a Summary report. The system first prompts for the estimate and output file names and displays the schedule file to be used for the report, as described in Sect. 9.0. If a recalculation needs to be performed, it must be done before report generation.

The next prompt allows you to select a specific WBS (or all Bills of Material), as described in Sect. 9.0. When the above prompts have been answered, the system will display the Summary Report Sort Selection screen (AES.6.4).

Summary Report Sort Selection Screen (AES.6.4)



Enter the letter of the primary sort field. The system will then prompt for the second sort field and then the third. Press the UP-ARROW to move the cursor back to the previous sort field if it needs to be changed. A maximum of three fields may be used as sort keys. If less than three fields are to be used in sorting, press the RETURN key again after the last one has been entered.

Several of the sort fields require additional information if they are selected, and the system prompts you for this information. For example, if WBS is entered as a sort field, the system will prompt for the WBS level:

Enter Sort Field Number 1: W Enter Level: _.

Enter a valid WBS level between 1 and 9. If Fiscal Year is entered as a sort field, the system will prompt for the schedule file name:

Enter Schedule File Name: _____.

If the schedule file entered does not exist, the system will issue a warning and prompt again for a schedule file name. Without a schedule file, the Summary report cannot be generated using Fiscal Year as a sort field.

The system will also prompt for a WBS Title File filename:

Enter WBS TF File Name: _____.

If the WBS Title File does not exist, the system will issue a warning and prompt again for a WBS Title File. If a WBS Title File is not being used, press the RETURN key to continue.

The system will request the beginning page number of the report and then the increments in which dollars are to be reported:

Dollars are to be reported in increments of: _____.

Enter either 1 or 1000 for the amount one dollar should represent in the Summary report, and press the RETURN key.

After you have entered all information needed for the Summary report, the system will display the following message on the screen:

PRODUCING SUMMARY REPORT

REPORT WILL BE IN FILE:
xxxxxxx.OUT.

In this message, xxxxxxx.OUT represents the output file name. When the system has created the report, the Report Menu will again be displayed. The time period before returning to the Report Menu will vary depending on the size of the estimate file.

9.5 CONTINGENCY REPORT

Option 5 from the Report Menu generates a Contingency report. The system first prompts for the estimate and output file names and displays the schedule file to be used for the report, as described in Sect. 9.0. If a recalculation needs to be performed, it must be done before report generation.

When the above file name prompts have been answered, as well as a prompt for a WBS number, the system will display the Contingency Report Sort Selection screen (AES.6.5).

Contingency Report Sort Selection Screen (AES.6.5)

```
CONTINGENCY REPORT

                    Contingency Report
                      Sort Selection


   W - WBS                      A - B/M Attribute
   C - Cost Code                B - Building/Area
   P - Participant              F - Fiscal Year
   D - Discipline               T - Trace Number

Enter the appropriate letters for the fields you
wish to sort by.  Up to 3 fields can be selected.

Enter Sort Field Number 1: _

Press Return When Sort Arrangement Complete

                                                    AES.6.5
```

Enter the letter of the primary sort field. The system then prompts for the second sort field and then the third. Press the UP-ARROW to move the cursor back to the previous sort field if it needs to be changed. A maximum of three fields may be used as sort keys. If less than three fields are to be used in sorting, press the RETURN key again after the last one has been entered.

Several of the sort fields require additional information if they are selected, and the system prompts you for this information. For example, if WBS is entered as a sort field, the system will prompt for the WBS level:

Enter Sort Field Number 1: W Enter Level: _.

Enter a valid WBS level between 1 and 9. If Fiscal Year is entered as a sort field, the system prompts for the schedule file name:

Enter Schedule File Name: _____.

If the schedule file entered does not exist, the system issues a warning and prompts again for a schedule file name. Without a schedule file, the Contingency report cannot be generated using Fiscal Year as a sort field.

The system also prompts for a WBS Title File file name:

Enter WBS TF File Name: _____.

If the WBS Title File does not exist, the system issues a warning and prompts again for a WBS Title File. If a WBS Title File is not being used, press the RETURN key to continue.

The system prompts for the beginning page number of the report and then requests the increments in which dollars are to be reported:

Dollars are to be reported in increments of: _____.

Enter either 1 or 1000 for the amount one dollar should represent in the Contingency report, and press the RETURN key.

After you have entered all information needed for the Contingency report, the system displays the following message on the screen:

PRODUCING CONTINGENCY REPORT

REPORT WILL BE IN FILE:
xxxxxxxx.OUT.

In this message, xxxxxxxx.OUT represents the output file name. When the system has created the report, the Report Menu is again displayed. The time period before returning to the Report Menu will vary depending on the size of the estimate file.

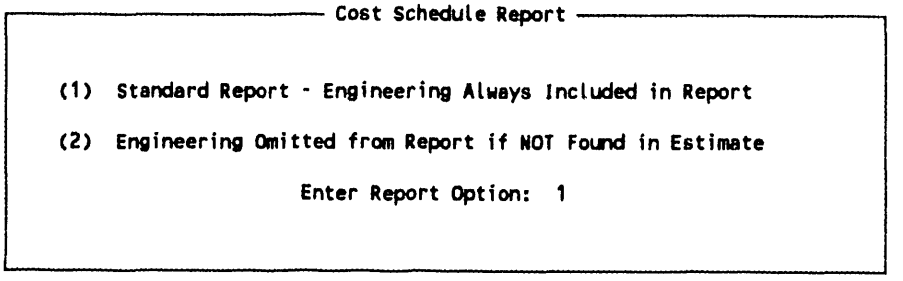
9.6 COST SCHEDULE SUMMARY

Option 6 from the Report Menu generates a Cost Schedule Summary report. The system first prompts for the estimate file name, as described in Sect. 9.0, and then displays a prompt for the Schedule file name:

Enter Schedule File Name: _____

Enter the file name, or select from the directory listing to complete this prompt. This prompt is followed by a prompt for the output file name. The schedule file to be used for the report will be displayed, as described in Sect. 9.0. If a recalculation needs to be performed, it must be done before report generation.

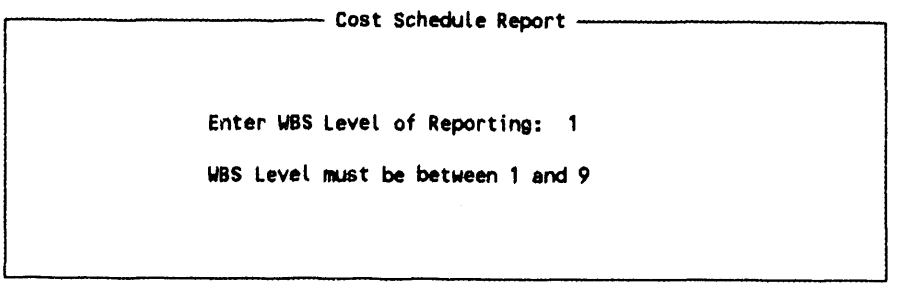
The next prompt allows you to select whether or not to include Engineering in the report:



The system next prompts for selection of a WBS and a beginning page number, as described in Sect. 9.0. When these prompts have been answered, the system requests the increments in which dollars are to be reported:

Dollars are to be reported in increments of: ____.

Enter either 1 or 1000 for the amount one dollar should represent in the Cost Schedule Report, and press the RETURN key. Next, a WBS Level of Reporting prompt is displayed:



Enter a valid WBS Level between 1 and 9.

After all information needed for the Cost Schedule Summary report has been entered, the system displays the following message on the screen:

PRODUCING COST SCHEDULE SUMMARY

REPORT WILL BE IN FILE:
xxxxxxxx.OUT.

In this message, xxxxxxxx.OUT represents the output file name. When the system has created the report, the Report Menu is again displayed. The time period to generate the Cost Schedule Summary report will vary depending on the size of the estimate file.

9.7 WBS/PARTICIPANT SUMMARY

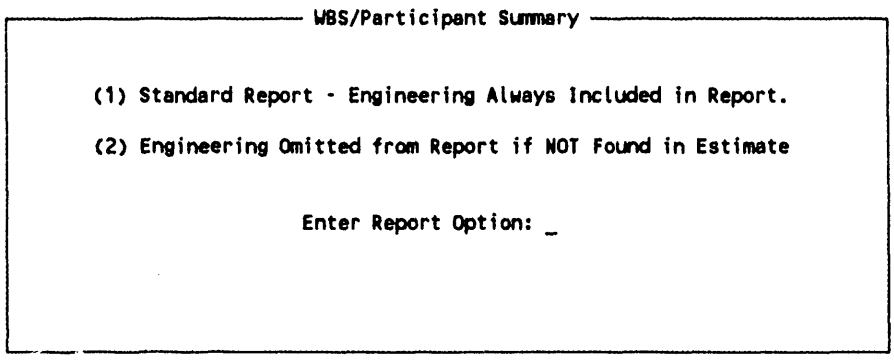
Option 7 from the Report Menu generates a WBS/Participant Summary report. The system first prompts for the estimate file name as described in Sect. 9.0 and, then, for the WBS Title File file name:

Enter WBS TF File Name: _____.

If the WBS Title File file entered does not exist, the system will issue a warning and prompt again for a WBS Title File file name. If a WBS Title File is not being used, press the RETURN key to continue.

The system next prompts for the output file name as described in Sect. 9.0. When the above file name prompts have been answered, the system displays the schedule file to be used for the report, as described in Sect. 9.0. If a recalculation needs to be performed, it must be done before report generation.

The next prompt allows you to select a standard or nonstandard report, which determines whether or not Engineering data are to be included:



Enter the desired report option.

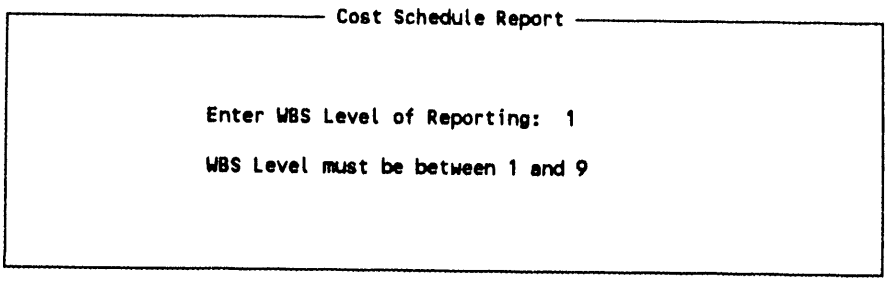
The system next prompts for the WBS level to be used in the WBS/Participant Summary report and the beginning page number, as described in Sect. 9.0.

The system then requests the increments in which dollars are to be reported:

Dollars are to be reported in increments of: ____.

Enter either 1 or 1000 for the amount one dollar should represent in the WBS/Participant Summary report, and press the RETURN key.

Next, a WBS Level of Reporting prompt is displayed:



After you have entered all information needed for the WBS/Participant Summary report, the system displays the following message on the screen:

PRODUCING WBS/PARTICIPANT SUMMARY

REPORT WILL BE IN FILE:
xxxxxxxx.OUT.

In this message, xxxxxxxx.OUT represents the output file name. When the system has created the report, the Report Menu is again displayed. The time period to generate the WBS/Participant Summary report will vary depending on the size of the estimate file.

9.8 FISCAL YEAR SUMMARY

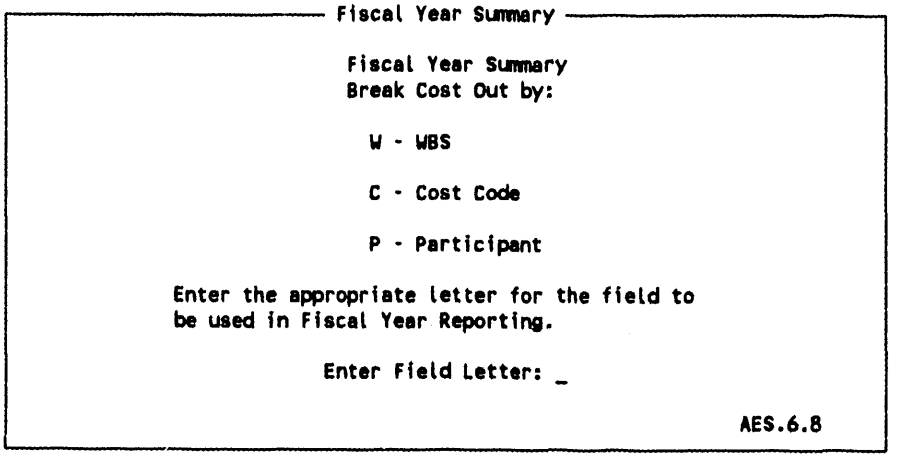
Option 8 from the Report Menu generates a Fiscal Year Summary report. The system first prompts for the estimate file name as described in Sect. 9.0. The system then displays a prompt for the Schedule file name:

Enter Schedule File Name: _____

Enter the file name, or select from the directory listing to complete this prompt. This prompt is followed by a request for the output file name. The system next displays the schedule file to be used for the report, as described in Sect. 9.0. If a recalculation needs to be performed, it must be done before report generation.

When the above file name prompts have been answered, as well as the prompt for selection of a WBS, the system displays the following screen:

Fiscal Year Summary Screen (AES.6.8)



Enter the letter of the field for which the Fiscal Year Summary will report cost.

The system next prompts for a beginning page number, as described in Sect. 9.0. When these prompts have been answered, the system requests the increments in which dollars are to be reported:

Dollars are to be reported in increments of: ____.

Enter either 1 or 1000 for the amount one dollar should represent in the Fiscal Year Report, and press the RETURN key.

After all information needed for the Fiscal Year Summary report has been entered, the system displays the following message on the screen:

PRODUCING FISCAL YEAR SUMMARY

REPORT WILL BE IN FILE:
xxxxxxxx.OUT.

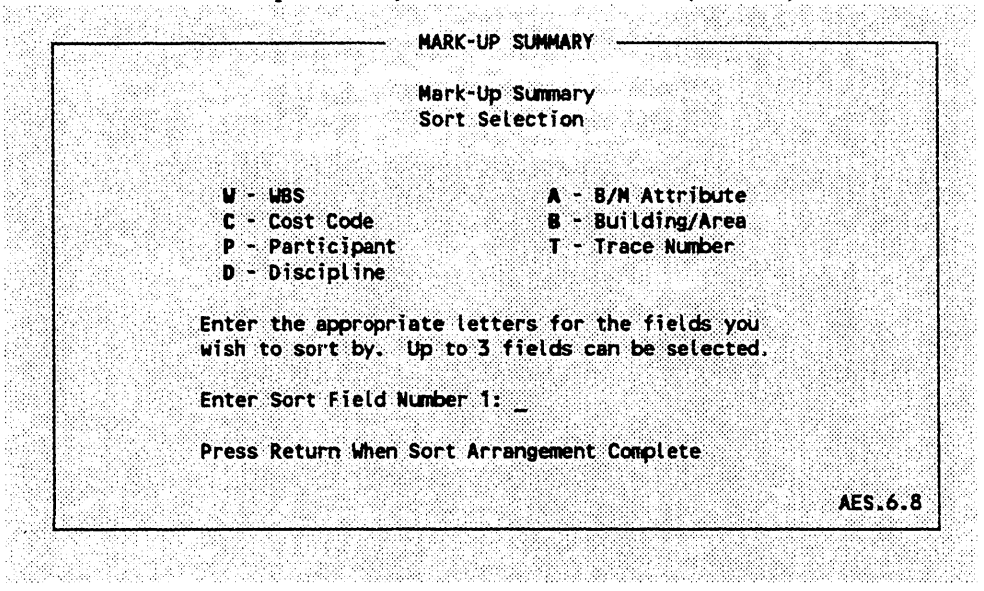
In this message, xxxxxxxx.OUT represents the output file name. When the system has created the report, the Report Menu is again displayed. The time period to generate the Fiscal Year Summary report will vary depending on the size of the estimate file.

9.9 MARK-UP SUMMARY REPORT

Option 9 on the Report Menu generates a Mark-Up Summary report. The Mark-Up Summary report lists all Bill of Material records and their mark-up values.

When both estimate file name, output file name, WBS selection, and beginning page number prompts have been answered, the Mark-Up Summary Sort Selection screen (AES.6.8) is displayed:

Mark-Up Summary Sort Selection Screen (AES.6.8)



Select up to three sort arrangements for the report. The following message will appear on the screen:

PRODUCING MARK-UP SUMMARY REPORT

REPORT WILL BE IN FILE: xxxxxxxx.OUT.

In this message, xxxxxxxx.OUT represents the output file name. When the Mark-Up Summary report has been created, the system returns to the Report Menu.

9.10 BASES OF ESTIMATE REPORT

Option 10 generates the Bases of Estimate report, which was previously a cover sheet for all AES reports. To reduce multiple copies, the Bases of Estimate is presented as a separate report.

To request this report, you are prompted for the estimate file name and output file name. If the Bases of Estimate File does not exist for the entered estimate file, an error message is displayed, and you are allowed to re-enter the file name or press CTRL Z to exit.

If a Bases of Estimate File exists for the entered estimate file, the system displays:

PRODUCING BASES OF ESTIMATE REPORT

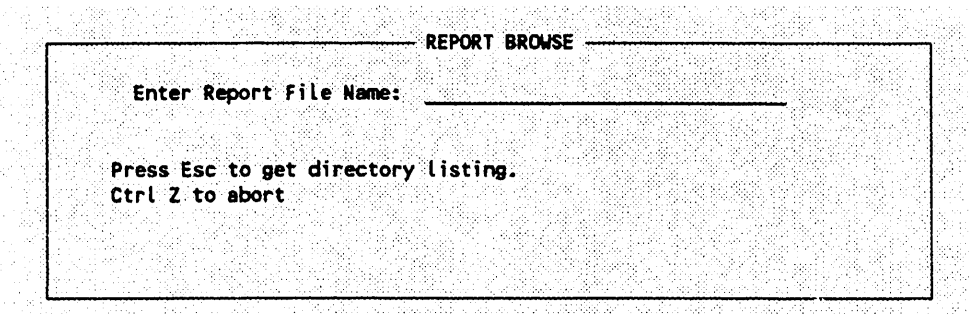
REPORT WILL BE IN FILE:
XXXXXXXX.OUT

Upon completion of this report, the system returns to the Report Menu.

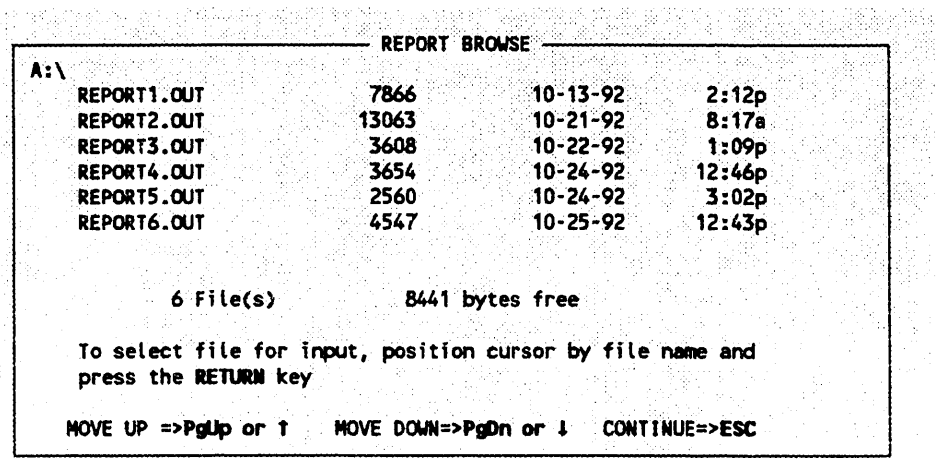
9.11 REPORT BROWSE

The Report Browse option (option 11) of the Report Menu allows you to view any of the reports that currently exist in the reports directory listing. The reports are displayed on the screen, and the UP-, DOWN-, RIGHT-, and LEFT-ARROW keys allow you to scroll the screen image to view all parts and pages of the reports.

The reports are accessed through the reports directory listing and a system prompt that requests a report file name:

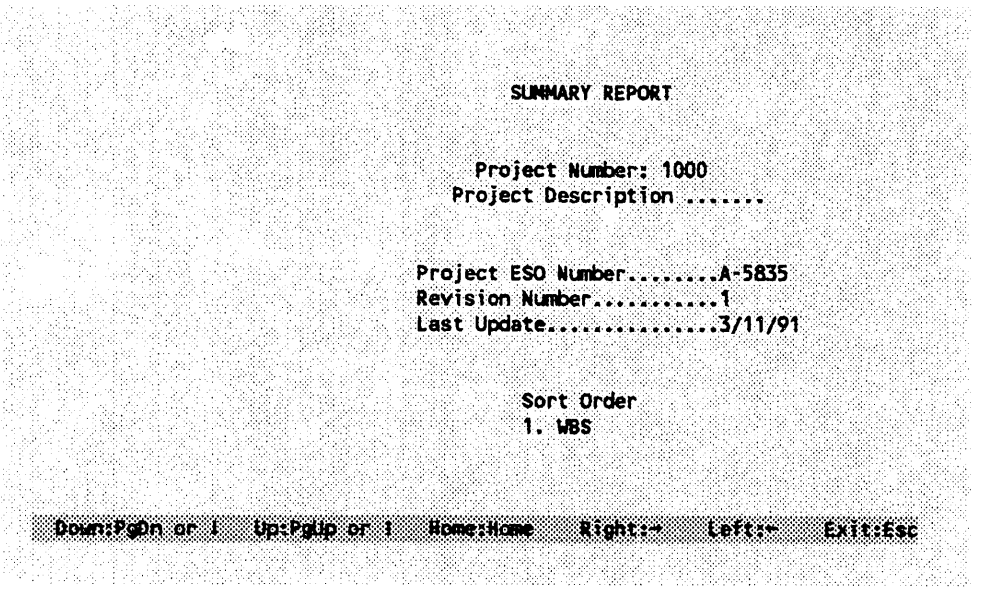


The file name entered must exist in the file directory. The directory can be used to select the file name. Press ESC to see the directory listing.



The PAGE-UP, UP-ARROW, PAGE-DOWN, and DOWN-ARROW keys are used to move the cursor next to the report file name to be selected. After positioning the cursor by the appropriate file name, press the RETURN key to mark this file. An asterisk (*) will appear by the file name selected. Press the ESC key to return to the file name prompt. The report file name selected will be displayed. Press the RETURN key to continue.

The screen will be blank while the report is being loaded, and the message "LOADING xxxxxxx.OUT" is displayed in the lower left corner of the screen.



When the report appears on the screen, the last screen line displays directions for performing scrolling to view the entire report:

Down:PgDn or ↓ Up:PgUp or ↑ Home:Home Right: → Left: ← Exit:Esc

Use the ARROW keys in the direction indicated to move the report around on the terminal screen. When viewing of the report is complete, press the ESC key to return to the AES Report Menu.

9.12 AES PRINT REPORT

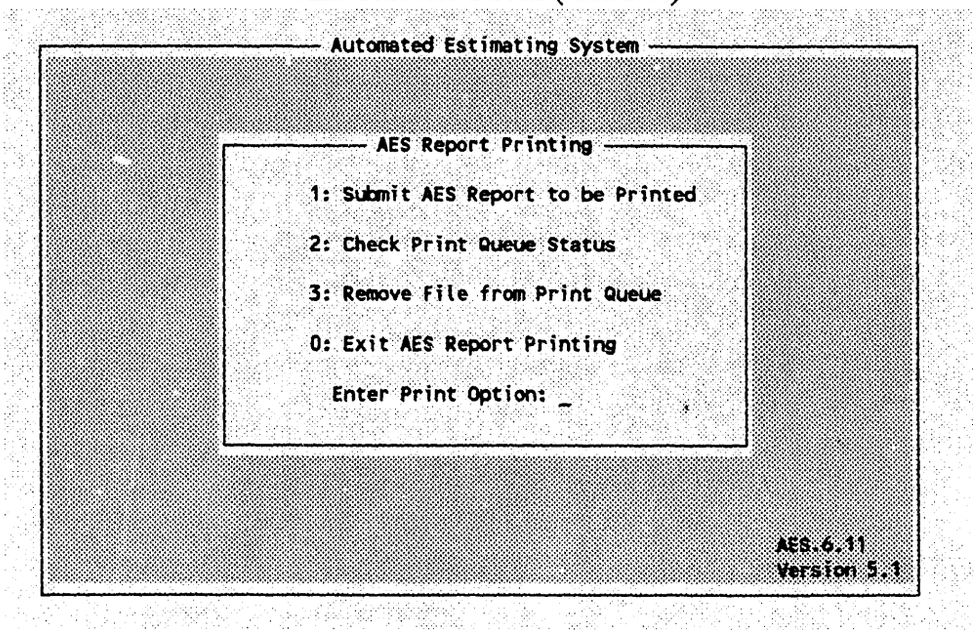
Option 12 on the Report Menu allows AES reports to be submitted to the DOS print queue. Before the AES Print Report will work, DOS PRINT must be loaded. If print has not been loaded, the following message is displayed:

PRINT.COM Not Installed...Program Terminating.
Press any key to Exit.

Press any key to exit to the Report Menu, and then issue the PRINT command at the DOS prompt before re-entering AES.

After issuing the DOS PRINT command, enter AES, select AES Reports from the Main Menu, and then select option 11 from the Report Menu. The following screen will be displayed:

AES Schedule Screen (AES.6.11)



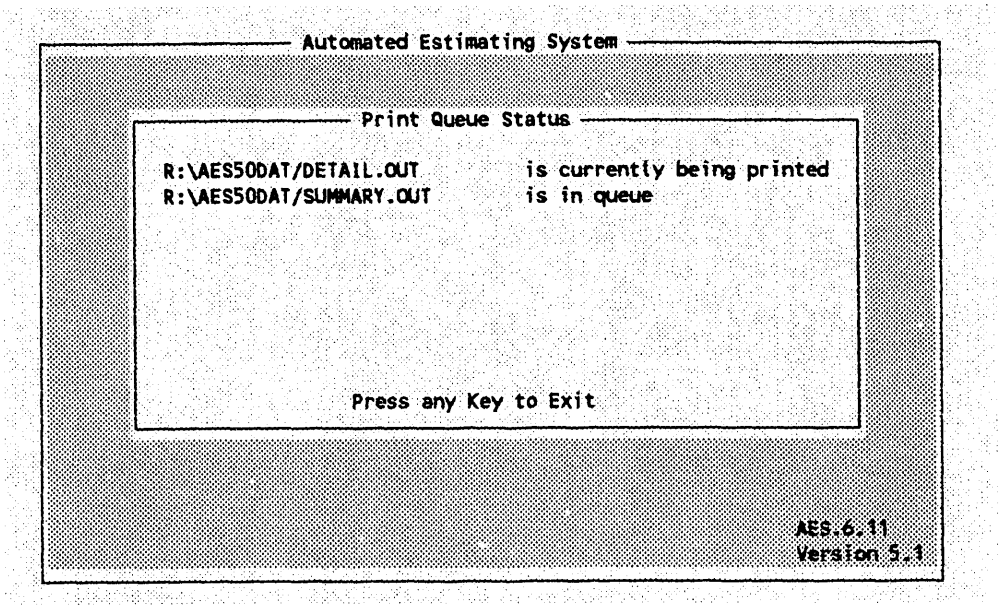
Option 0 returns you to the Report Menu. The other options on this menu are described in the following sections.

9.12.1 Submit AES Report to be Printed

Option 1 on the AES Report Printing menu prompts you for the report file name. After the file name is entered, the report is submitted to the DOS print queue.

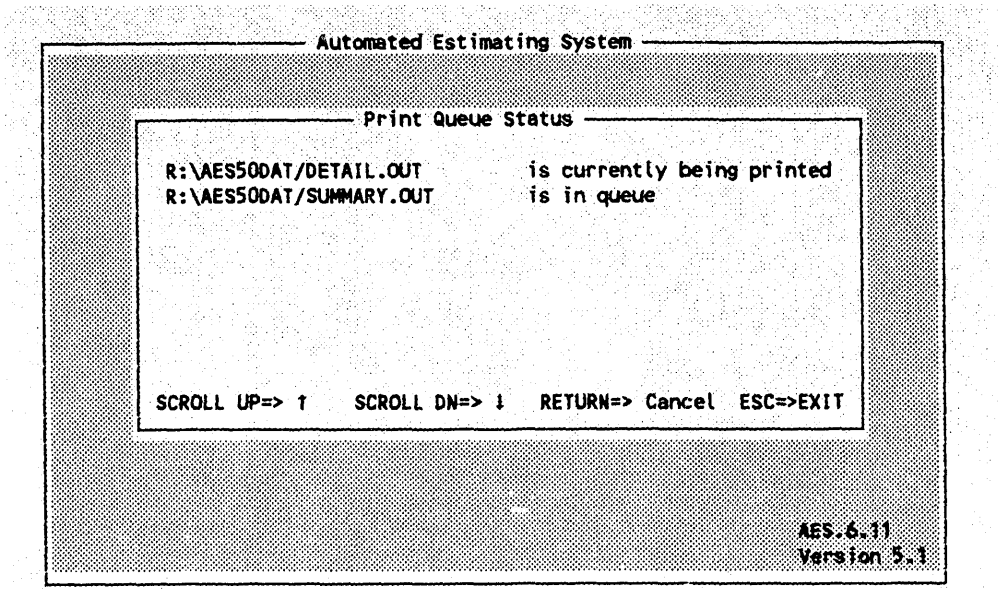
9.12.2 Check Print Queue Status

Option 2 on the Report Printing menu displays the current status of the print queue on the following screen:



9.12.3 Remove File from Print Queue

Option 3 on the Report Printing menu displays the print queue with directions to move the cursor and cancel the displayed reports:



Position the cursor on the report to be removed from the print queue, and press RETURN to remove the report.

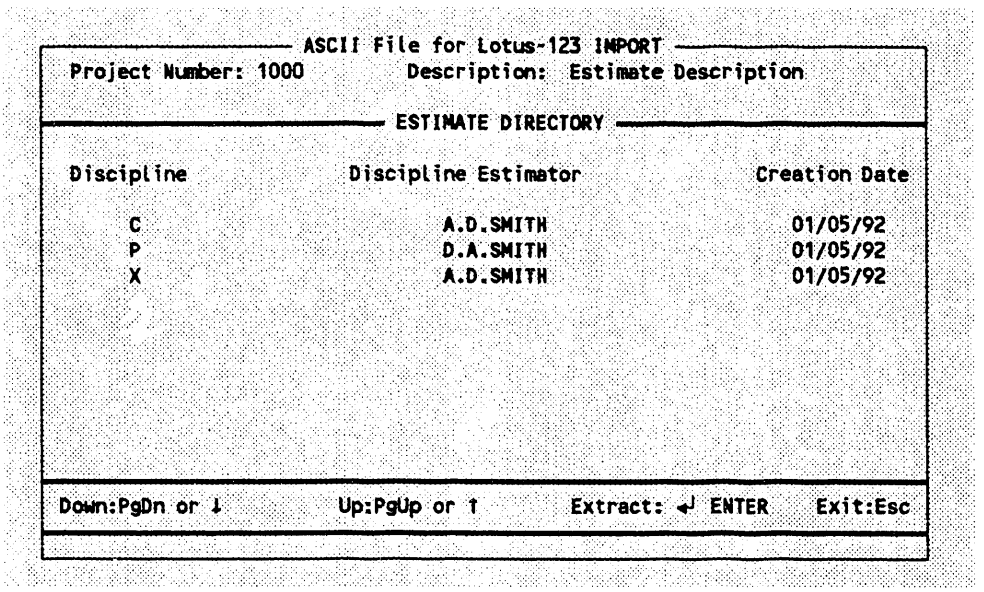
9.13 ASCII FILE FOR LOTUS IMPORT

Option 13 on the Report Menu screen dumps the estimate data into a file in a format that can be imported into Lotus 1-2-3.

The system first prompts for the estimate and output file names as described in Sect. 9.0. The system then prompts if Job Factor is to be applied.

APPLY JOB FACTOR??? [Y/N]:

Answer Y or N to this prompt. The following screen will be displayed:



The Estimate Records are displayed. The PAGE-UP and PAGE-DOWN keys permit scrolling through the Estimate Records. Use the UP- and DOWN-ARROW keys to place the cursor on the record to be extracted and press the RETURN key to mark the record. After all records to be extracted have been marked, press the ESC key.

The system displays the following message:

PRODUCING FLAT ASCII FILE

REPORT WILL BE IN FILE:
xxxxxxxx.PRN.

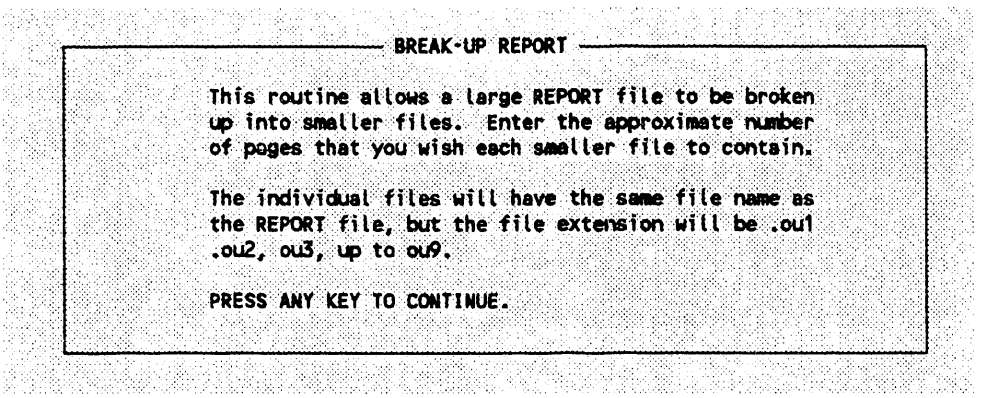
In this message xxxxxxxx.PRN represents the output file name. When the system has completed dumping the data, the Report Menu is again displayed. The time period before returning to the Report Menu will vary depending on the size of the estimate file.

The data in the output file have double quotes around each text field, and all fields are separated by commas. The format of the data is shown below, and the lengths of the text fields are indicated.

Variable	Type	Length
Trace Number	Text	7
Line Item Number	Text	4
Item Description	Text	141
Material Quantity	Real	xxxxx.xx
Material Unit	Text	6
Material Price	Real	xxxxxx.xx
Total Material	Real	xxxxxxxx
Unit Hours	Real	xxxxx.xxx
Total Hours	Real	xxxxx
Craft Code	Text	2
Total Labor	Real	xxxxxxx
Total Cost	Real	xxxxxxxxx

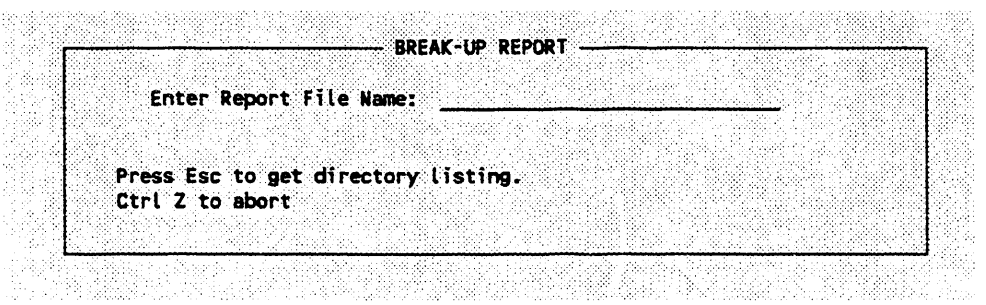
9.14 BREAK-UP REPORT FILES

Option 14 from the Report Menu allows you to break up large report files into smaller files of a specified number of pages to allow for more efficient printing of the report using more than one printer. The system displays the following description screen:



The individual file names (.ou1, .ou2, etc.) are not listed on the AES report directory listing; only the complete report file is retained and available from that directory. The broken up files can be accessed for printing from the computer's DOS directory listing.

The system requests the report file name to be used for this function:



Enter the report file that is to be broken up, using the directory listing to select the file if necessary. The system then prompts:

Enter Approximate Number of Pages per File: ___
and PRESS RETURN.

Enter the number of pages you wish each file to contain and press RETURN. While the report is being processed, the system displays the message:

PROCESSING REPORT FILE

and then gives the file information:

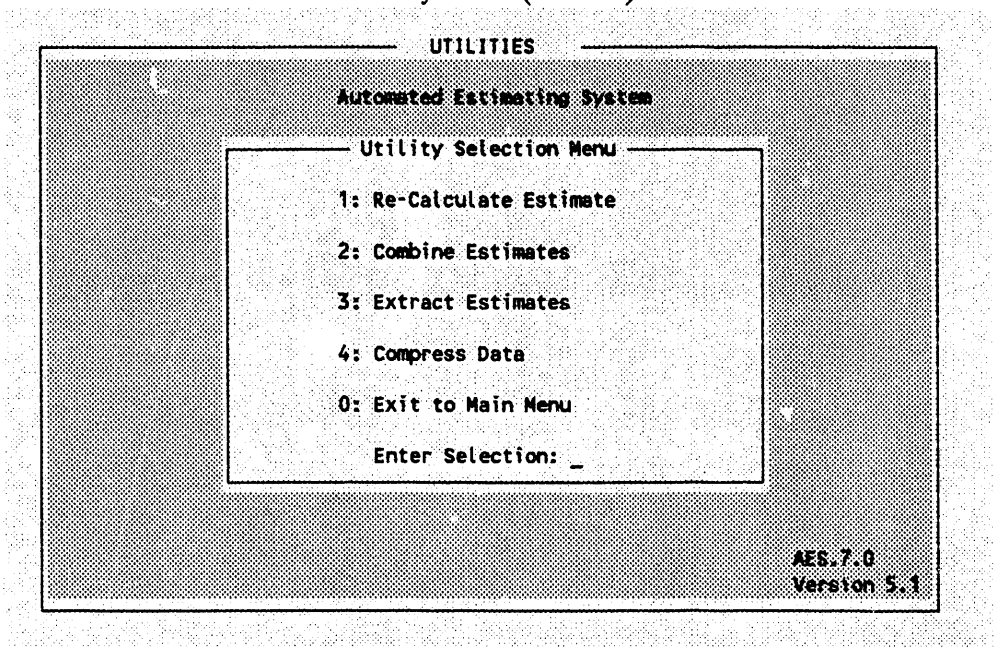
xxxxxxxx.OUT
has been broken up into X files

PRESS ANY KEY TO CONTINUE.

10.0 AES UTILITIES

Selecting option 7, AES Utilities, from the AES Main Menu displays the Utility Menu (AES.7.0) from which utility options may be chosen.

Utility Menu (AES.7.0)



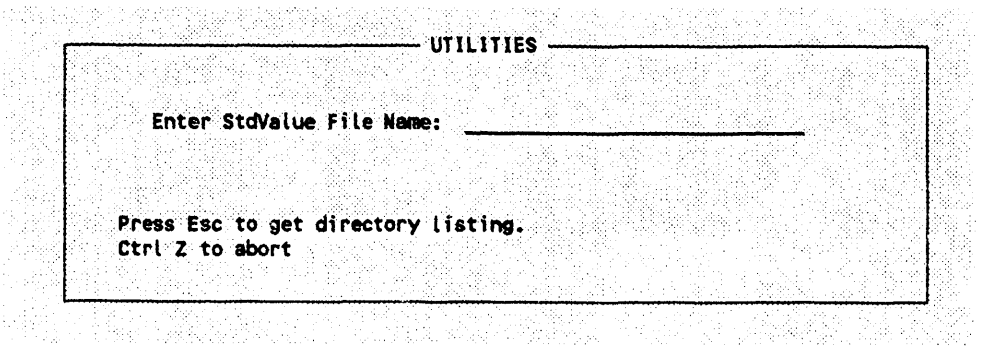
Enter a utility selection number and press RETURN. The prompts to be followed in performing these utilities are given in Sects. 10.1 through 10.4. Option 0 exits the utility function and return to the Main Menu.

Each of the four options requests you to specify an estimate file name. This estimate file name can be selected from a directory listing obtained by pressing ESC at the estimate file name prompt. (See Sect. 5.1 for an example of an estimate directory listing screen and directions for making a selection from the listing.)

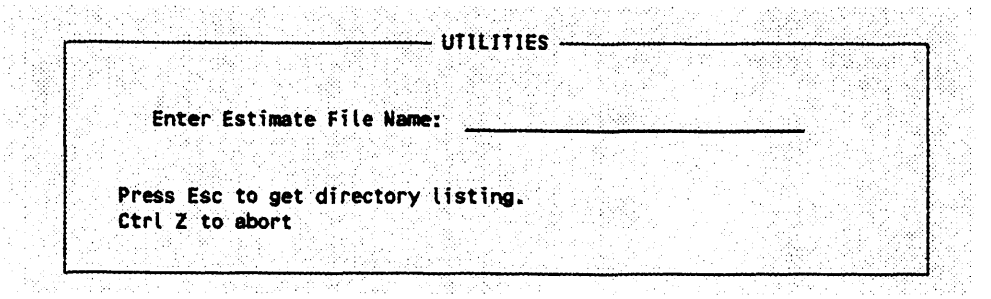
10.1 RECALCULATE ESTIMATE

The first option from the Utility screen, Re-Calculate Estimate, recalculates the estimate using the indirect and direct additive values, labor rates, and average escalation rates. This utility option should be performed whenever a change has been made to the Standard Value file or to the schedule file.

When option 1 is selected from the Utility Menu, the system prompts for the file name of the Standard Value file to be used in the recalculation.



After indicating the Standard Value file, the system prompts for the estimate file to be recalculated:

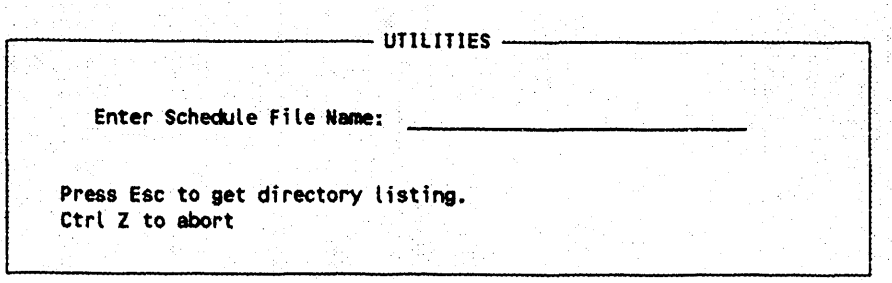


The file name can be a maximum of eight characters. This file name should not include a file extension. If the system cannot find the estimate file entered, it responds with the following message:

ERROR!! Estimate File Does Not Exist.

The system will prompt you again for a file name. The estimate directory listing can be used to view valid file names.

After the estimate file name has been correctly entered, the system prompts for the schedule file name:

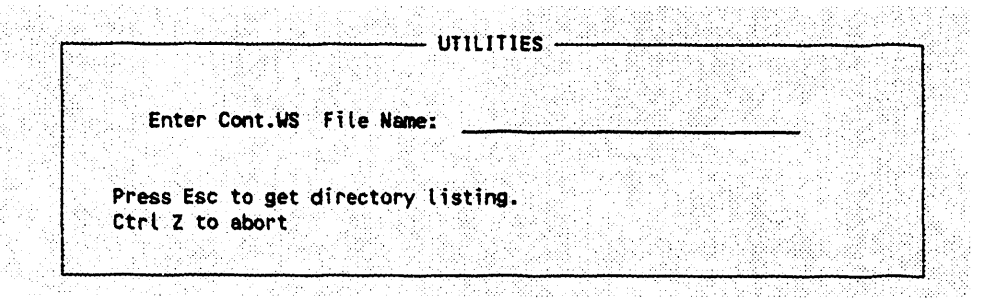


If a schedule file is not being used, press the RETURN key. If a schedule file is being used, type the schedule file name (without a file extension) to be used in recalculating the estimate. Enter the schedule file if the average escalation rates for the Bills of Material need updating. If the schedule file cannot be found, the system displays the following message:

WARNING!! Schedule File Does Not Exist.

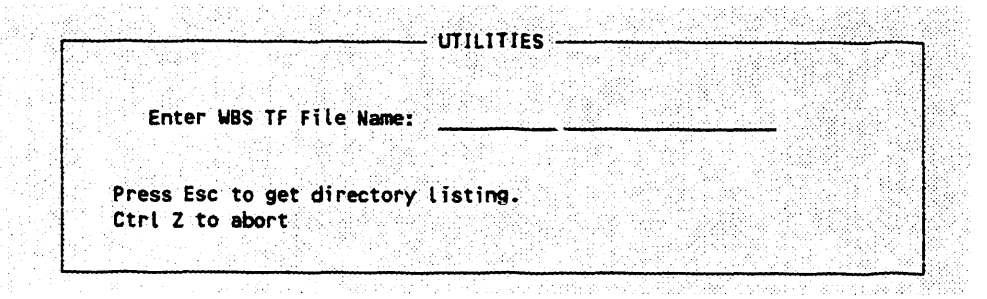
The system prompts you again for a schedule file name that exists on the directory listing.

Once a valid schedule file name has been entered or the RETURN key has been pressed, the system prompts for a contingency work sheet file name:



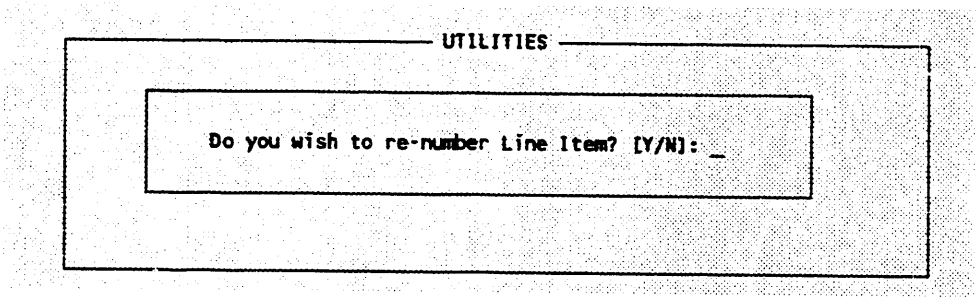
If a contingency file is not being used, press the RETURN key. If a contingency file is being used, type in the contingency file name (without a file extension) to be used in recalculating the estimate. Enter the contingency file if the contingency percentages for the Bills of Material are to be updated from the contingency work sheet file.

After a valid contingency file name has been entered or the RETURN key has been pressed, the system prompts for a WBS Title file name:



If a WBS Title file is not being used, press the RETURN key. If a WBS Title file is being used, type in the WBS Title file name. Enter the WBS Title file if the WBS titles for the Bills of Material are to be updated from the WBS Title file.

The system next asks if Line Items are to be renumbered:



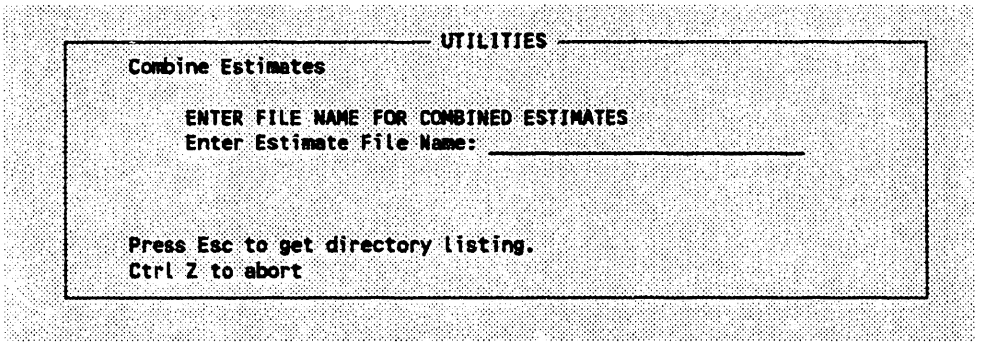
When responses to the above prompts have been correctly entered, the system performs the recalculation function and displays the message

RE-CALCULATING ESTIMATE

on the screen. When the system has completed recalculating the estimate, it returns to the Utility Menu. The time period before returning to the Utility Menu will vary depending on the size of the estimate file.

10.2 COMBINE ESTIMATES

Option 2, Combine Estimates, combines up to six estimates of the same project into one file. After this option is selected, the system will prompt for a file name for the combined estimates.

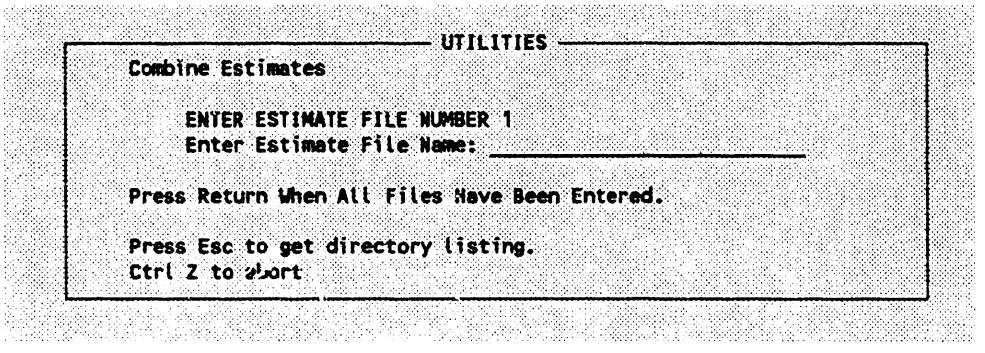


If the file that is entered already exists, the system will display:

Estimate file already exists

The system will allow you to enter another file name.

After the file name for the combined estimates has been entered, the system responds with the following screen:

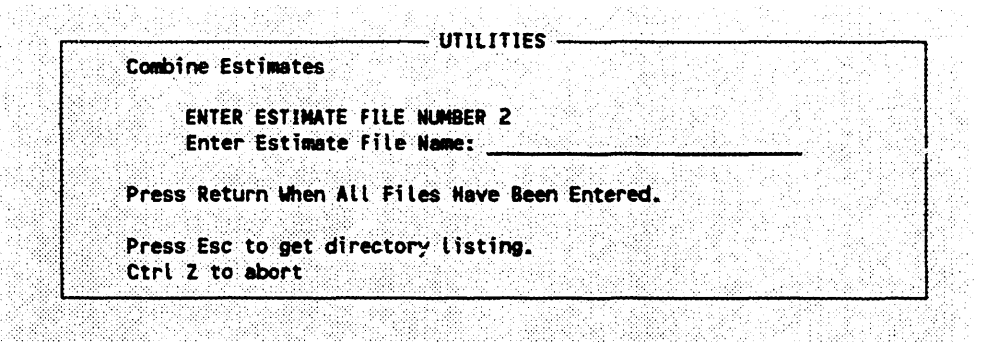


Enter the name of the first estimate to be combined. The system will check for the existence of the estimate file. If the file cannot be found, the system issues the error message

ERROR!! Estimate File Does Not Exist

and prompts again for the estimate file name. The directory listing can be used to verify the existing file names.

If the file exists, the system prompts for the second estimate file to be combined:



Enter the second estimate file to be combined. The system will again check for the existence of this estimate file and will also check that the project number and base fiscal year/quarter match the previous estimate record. If the file exists and the project number and fiscal year/quarter match, the system prompts for the third file to be combined. If the file does not exist or is found to be in error, the system issues an error message and prompts for the file name again.

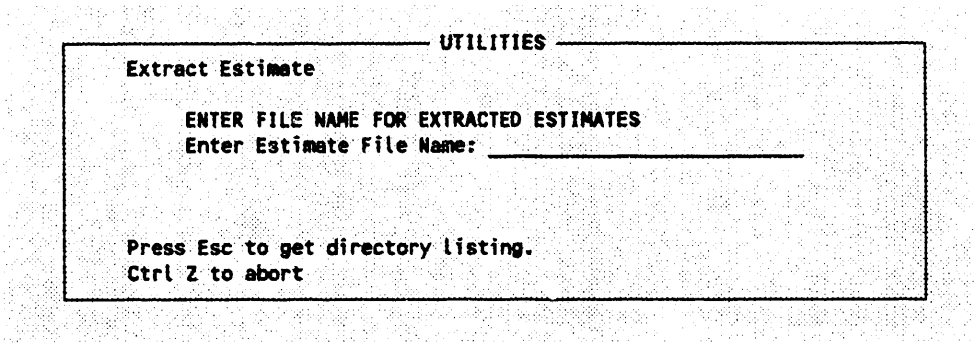
Up to six estimate files can be combined. If fewer than six are to be combined, press the RETURN key at the estimate file name prompt after all file names have been entered. The following message is displayed on the screen:

COMBINING FILES.

After the estimates have been combined, the system returns to the Utility Menu. This time period will vary depending on the size of the files and the number of files being combined.

10.3 EXTRACT ESTIMATES

Utility option 3, Extract Estimates, allows the extraction of an estimate from a file where two or more estimates have been combined. The system will first prompt for the estimate file name that is to hold the extracted estimate.

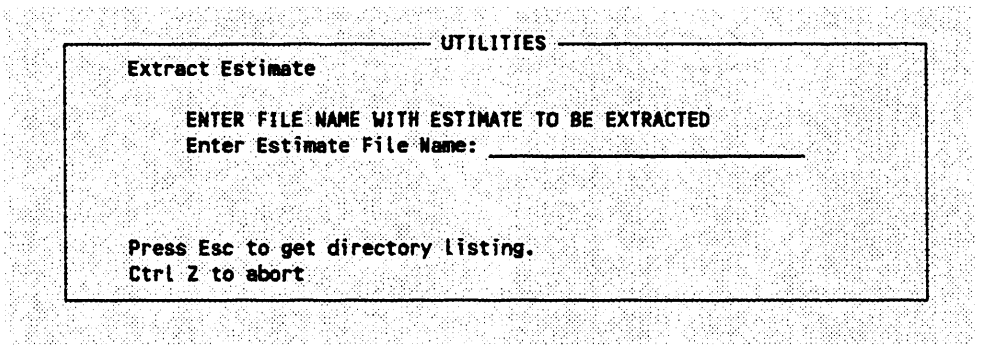


If the file name that is entered already exists, the system will display:

ERROR!! Estimate File already exists

and prompt for another file name.

The system next prompts for the estimate file name from which the estimate is to be extracted:



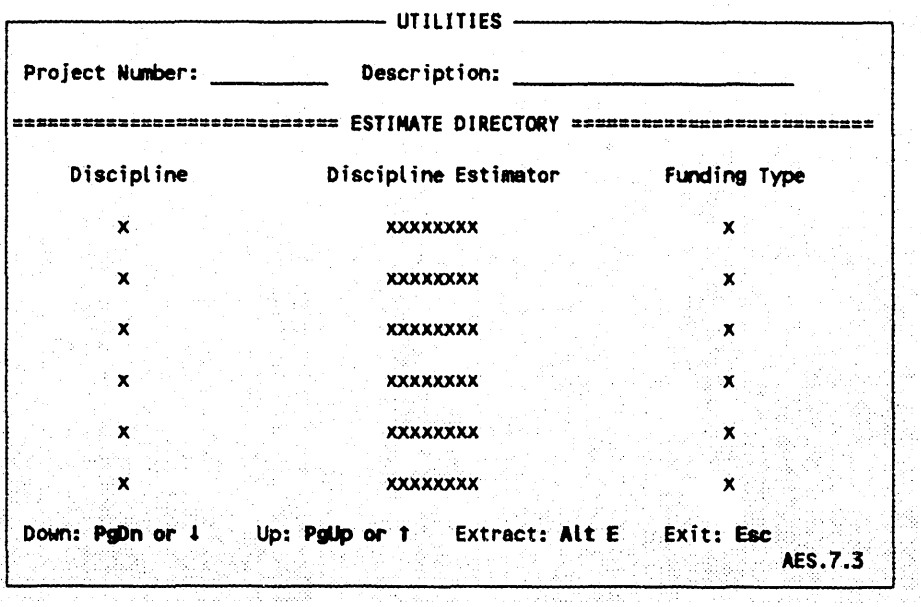
If the file entered does not exist, the system issues the error message

ERROR!! Estimate File Does Not Exist

and prompts again for the estimate file name.

When a valid estimate file name has been entered, the system displays the Estimate Directory (AES.7.3), where the project number, description, discipline, discipline estimator, and funding type for each estimate record is listed.

Estimate Directory (AES.7.3)



The PAGE-UP and PAGE-DOWN keys permit scrolling through the Estimate records.

Use the UP-ARROW and DOWN-ARROW keys to place the cursor on the estimate to extract, and press ALT and E simultaneously. The system displays the message

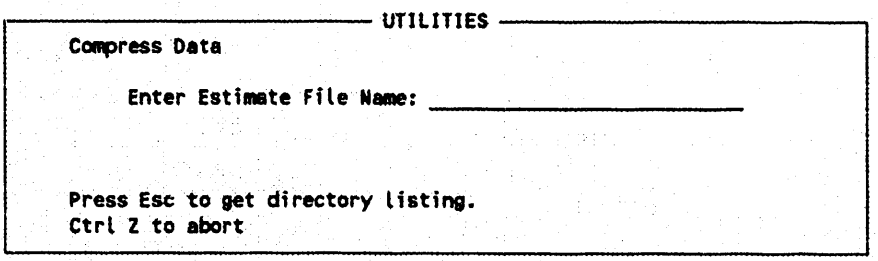
EXTRACTING ESTIMATE ,

writes the selected estimate to the file that has been indicated, and returns to the Utility Menu. The estimate will still exist in the original file.

The extraction of any estimate may be aborted by pressing ESC while in the Estimate Directory; the system will return to the Utility Menu.

10.4 COMPRESS DATA

Utility option 4, Compress Data, compresses the estimate file in order to save disk space. This option should be used if several records have been deleted from an estimate file. The system first prompts for the estimate file name that is to be compressed:



If the file does not exist, the system issues the error message

ERROR!! Estimate File Does Not Exist

and prompts again for the estimate file name.

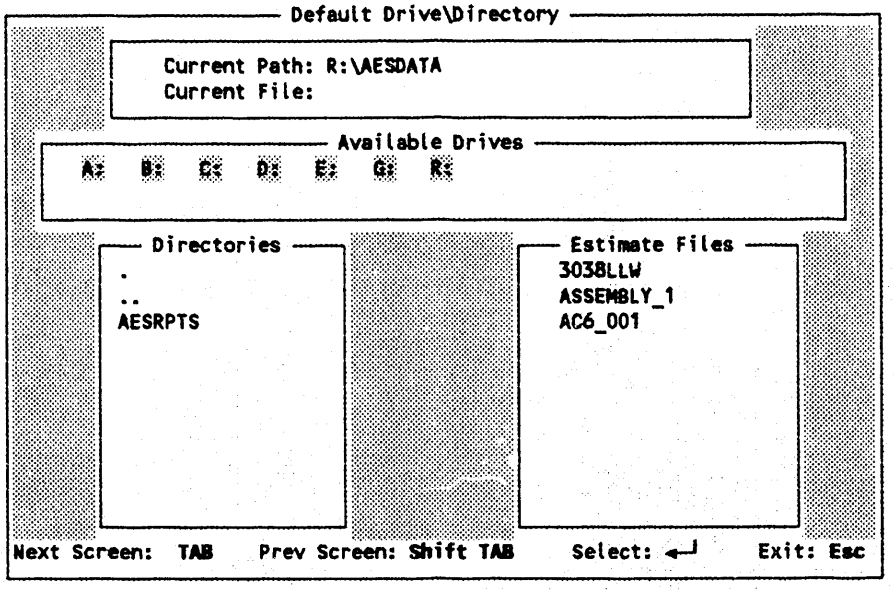
After a valid estimate file name has been entered, the message

COMPRESSING DATA

appears on the screen. The system returns to the Utility Menu when it has completed compressing the data.

11.0 SET DRIVE AND/OR DIRECTORY

Selecting option 8, Set Drive and/or Directory, from the AES Main Menu displays the Drive and Directory screen:

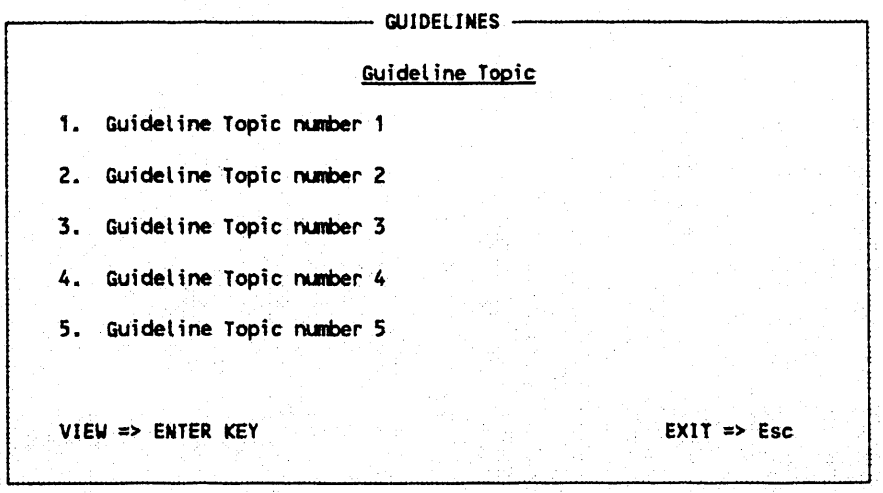


All existing drives, including LAN drives are displayed, as well as subdirectories under the current directory. Use the UP-ARROW and DOWN-ARROW keys to position the cursor on the desired drive or directory and press RETURN to select. The current setting is displayed at the top of the screen, and any existing estimate files are found in the selected drive/directory are displayed for optional selection. The TAB and SHIFT-TAB keys allow cursor movement between the drive, directory, and estimate file selection. After setting the default drive/directory, press the ESC key to return to the Main Menu.

12.0 VIEW GUIDELINES

Selecting option 9, View Guidelines, from the AES Main Menu displays a listing of the topics covered in the Guidelines File. The Guidelines File contains information on various topics concerning estimating and scheduling. The guidelines can also be viewed while creating or updating an estimate by pressing the SHIFT-F1 keys. The procedure explained below for viewing a particular topic is the same in either case.

The guidelines listing, displayed below, allows a particular topic to be selected for viewing.



To select a topic, use the UP-ARROW, DOWN-ARROW, PAGE-UP, and PAGE-DOWN keys to position the cursor on the topic of interest. Once the cursor has been positioned, press the RETURN key to view the information concerning the topic selected. After viewing the information, press the ESC key to return to the guidelines listing.

Press the ESC key to exit the View Guidelines function.

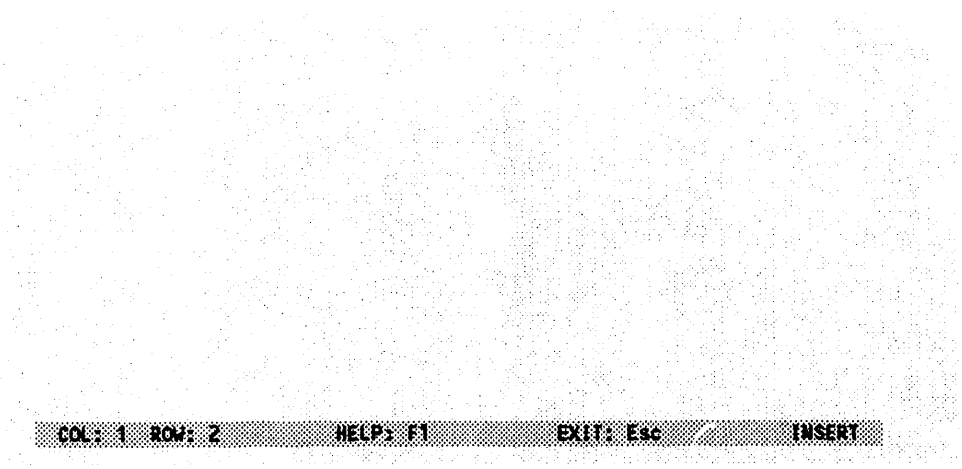
13.0 BASES OF ESTIMATE

Option 10, Bases of Estimate, on the Main Menu provides a utility that allows you to enter information concerning any assumptions that were made that may affect the current estimate. A report on this information can be generated by selecting option 10 from the Report Menu.

When the Bases of Estimate option is selected from the Main Menu, the system prompts for the estimate file name for which the bases of estimate are to be entered:

Enter Estimate File Name: _____

After a valid estimate file name has been entered, the following screen appears:



If information concerning the bases of estimate has previously been entered for the estimate, it will appear on this screen, where it can be modified using the following editing keys:

- Use the cursor keys (UP-ARROW, DOWN-ARROW, RIGHT-ARROW, and LEFT-ARROW) to move the cursor within the screen; the current row and column are displayed in the lower left-hand side of the screen.
- Press the HOME key to position the cursor at the beginning of the current line.
- Press the END key to position the cursor at the end of the current line.
- Press the CTRL-Y keys to delete the current line.
- Press the INSERT key to toggle between insert mode and overwrite mode.

After the bases of estimate have been entered and/or modified, press the ESC key to return to the Main Menu.

APPENDIX A

DESCRIPTION OF SCHEDULE BY CURVE

The purpose of this appendix is to describe the use of spending curves in the allocation of costs across time in the Automated Estimating System (AES). The allocation of costs to specific time periods is dependent on three inputs: the starting fiscal year and quarter, the duration in quarters, and the percentage of costs allocated to each quarter. The first two inputs, starting fiscal year and quarter and duration in quarters, are retrieved by the system from the Project Schedule file. The third input, the percentage allocation of costs to each quarter, is calculated based on the spending curve entered on the Bill of Material Record screen during estimate creation or update. The available curve types and descriptions are listed below.

Curve Type	Description
5	A curve with a bell-like shape.
1-4 6-9	Curves that apply varying degrees of skewness to curve type 5.
10	A linearly descending allocation over the time period.
15	A uniform allocation over the time period.
20	A linearly ascending allocation over the time period.

Figures A-1 and A-2 show the cumulative percentage distributions for the various curve types. The tables on pages A-4 through A-9 show the quarterly and cumulative percentage distributions for the various curve types. While these examples use a duration of 12 quarters, the system allows any duration from 1 to 160 quarters.

For the curve types 1 through 9, the base curve from which all other curves are calculated is curve type 5. The base curve consists of 36 datapoints, each representing the cumulative percentage of dollars expended in each time period on a typical construction project. A statistical study of spending patterns used empirical data from many Department of Energy (DOE) and predecessor agency projects to produce a theoretical cumulative distribution of costs across the life of a project. This distribution is in the form of 36 explicit points and does not strictly conform to any of the well-known distributions. It is, however, symmetrical and bell-shaped. The results of this study are documented in a DOE chart entitled "Theoretical Cumulative Progress Table." The AES relies on the manipulation of density functions to adjust these 36 points for different durations and amounts of skewness.

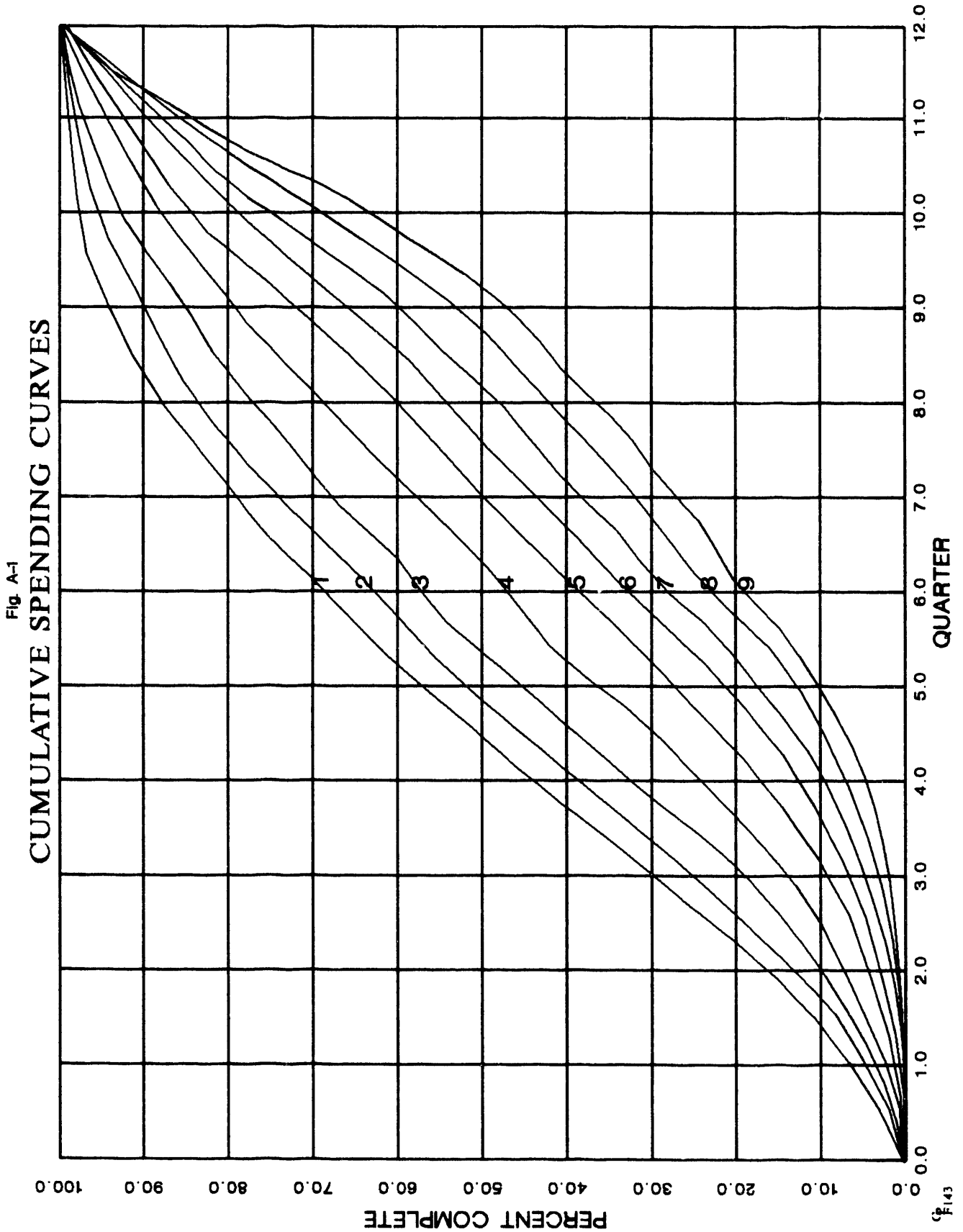

CUMULATIVE SPENDING CURVES
PERCENT COMPLETE
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
QUARTER
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
1
2
3
4
5
6
7
8
9

Fig. A-1

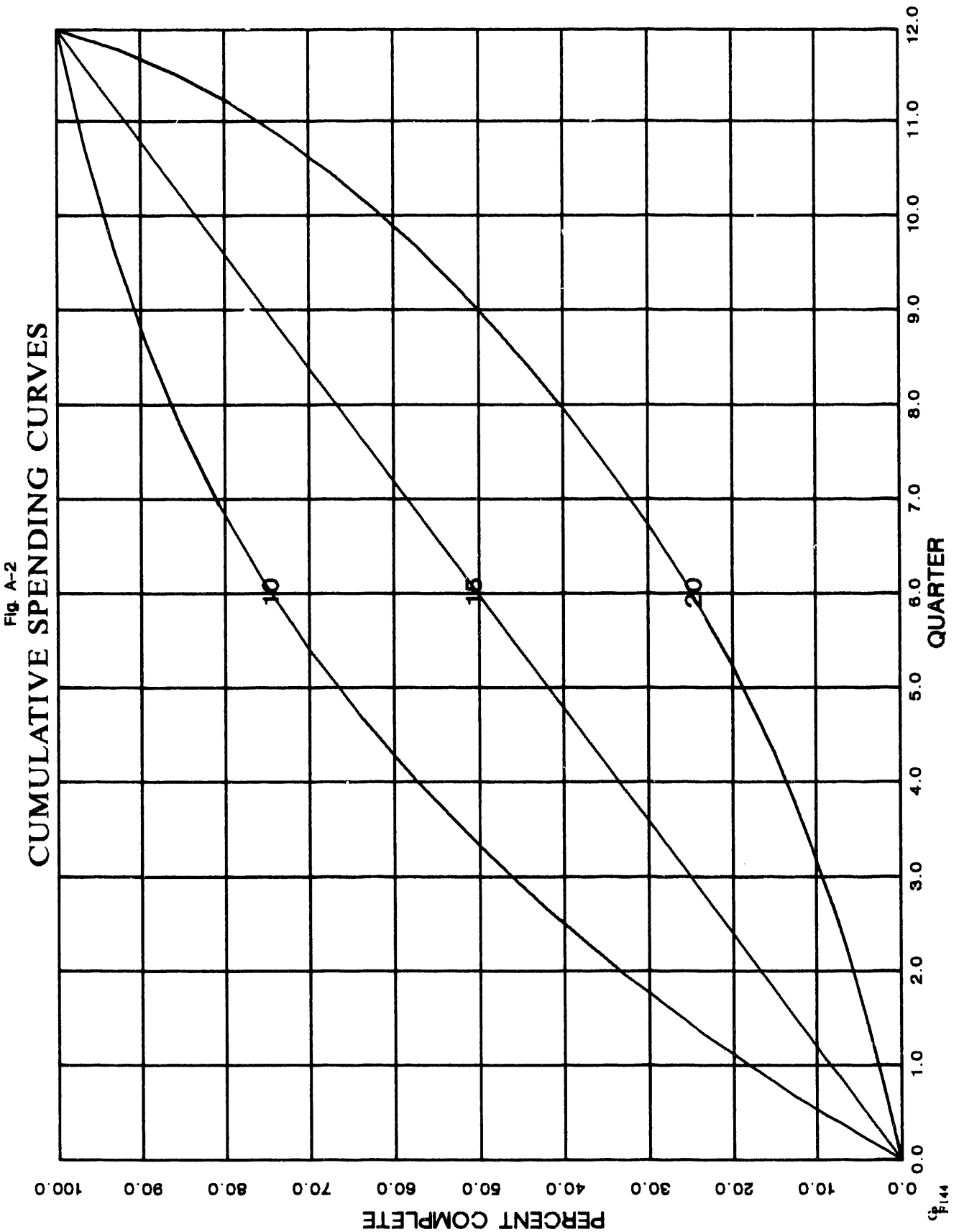

CUMULATIVE SPENDING CURVES
PERCENT COMPLETE
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
QUARTER
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
10
15
20

Fig. A-2

Starting Year.Qrt = 1992.4
Curve Type = 1
Duration in Quarters = 12

Year.Qrt	Quantity In Quarter	Quantity Cumulative
1992.4	6.29 %	6.29 %
1993.1	9.91 %	16.20 %
1993.2	12.14 %	28.34 %
1993.3	13.64 %	41.98 %
1993.4	13.98 %	55.96 %
1994.1	12.91 %	68.66 %
1994.2	10.96 %	79.83 %
1994.3	8.58 %	88.41 %
1994.4	6.23 %	94.64 %
1995.1	3.54 %	98.18 %
1995.2	1.41 %	99.58 %
1995.3	0.42 %	100.00 %

Starting Year.Qrt = 1992.4
Curve Type = 2
Duration in Quarters = 12

Year.Qrt	Quantity In Quarter	Quantity Cumulative
1992.4	3.68 %	3.68 %
1993.1	7.07 %	10.75 %
1993.2	9.86 %	20.61 %
1993.3	12.11 %	32.72 %
1993.4	13.78 %	46.50 %
1994.1	14.11 %	60.61 %
1994.2	12.90 %	73.50 %
1994.3	10.72 %	84.22 %
1994.4	8.09 %	92.31 %
1995.1	5.07 %	97.38 %
1995.2	2.08 %	99.46 %
1995.3	0.54 %	100.00 %

Starting Year.Qrt = 1992.4
Curve Type = 3
Duration in Quarters = 12

Year.Qrt	Quantity In Quarter	Quantity Cumulative
1992.4	2.17 %	2.17 %
1993.1	5.00 %	7.17 %
1993.2	7.79 %	14.97 %
1993.3	10.44 %	25.41 %
1993.4	12.84 %	38.24 %
1994.1	14.44 %	52.68 %
1994.2	14.35 %	67.03 %
1994.3	12.70 %	79.73 %
1994.4	9.95 %	89.68 %
1995.1	6.76 %	96.44 %
1995.2	2.85 %	99.28 %
1995.3	0.72 %	100.00 %

Starting Year.Qrt = 1992.4
Curve Type = 4
Duration in Quarters = 12

Year.Qrt	Quantity In Quarter	Quantity Cumulative
1992.4	1.33 %	1.33 %
1993.1	3.49 %	4.81 %
1993.2	6.10 %	10.92 %
1993.3	8.84 %	19.76 %
1993.4	11.58 %	31.34 %
1994.1	14.05 %	45.39 %
1994.2	15.23 %	60.62 %
1994.3	14.39 %	75.01 %
1994.4	11.82 %	86.83 %
1995.1	8.40 %	95.23 %
1995.2	3.88 %	99.11 %
1995.3	0.89 %	100.00 %

Starting Year.Qrt = 1992.4
Curve Type = 5
Duration in Quarters = 12

Year.Qrt	Quantity In Quarter	Quantity Cumulative
1992.4	0.81 %	0.81 %
1993.1	2.46 %	3.27 %
1993.2	4.67 %	7.94 %
1993.3	7.37 %	15.31 %
1993.4	10.29 %	25.60 %
1994.1	13.26 %	38.86 %
1994.2	15.55 %	54.41 %
1994.3	15.74 %	70.15 %
1994.4	13.67 %	83.82 %
1995.1	10.15 %	93.97 %
1995.2	4.96 %	98.23 %
1995.3	1.07 %	100.00 %

Starting Year.Qrt = 1992.4
Curve Type = 6
Duration in Quarters = 12

Year.Qrt	Quantity In Quarter	Quantity Cumulative
1992.4	0.53 %	0.53 %
1993.1	1.71 %	2.25 %
1993.2	3.59 %	5.83 %
1993.3	6.10 %	11.93 %
1993.4	9.03 %	20.96 %
1994.1	12.24 %	33.20 %
1994.2	15.34 %	48.54 %
1994.3	16.73 %	65.27 %
1994.4	15.33 %	80.60 %
1995.1	11.79 %	92.38 %
1995.2	6.25 %	98.64 %
1995.3	1.36 %	100.00 %

Starting Year.Qrt = 1992.4
Curve Type = 7
Duration in Quarters = 12

Year.Qrt	Quantity In Quarter	Quantity Cumulative
1992.4	0.34 %	0.34 %
1993.1	1.23 %	1.58 %
1993.2	2.74 %	4.31 %
1993.3	4.99 %	9.30 %
1993.4	7.84 %	17.14 %
1994.1	11.20 %	28.34 %
1994.2	14.80 %	43.14 %
1994.3	17.31 %	60.45 %
1994.4	16.83 %	77.28 %
1995.1	13.51 %	90.79 %
1995.2	7.56 %	98.34 %
1995.3	1.66 %	100.00 %

Starting Year.Qrt = 1992.4
Curve Type = 8
Duration in Quarters = 12

Year.Qrt	Quantity In Quarter	Quantity Cumulative
1992.4	0.24 %	0.24 %
1993.1	0.88 %	1.12 %
1993.2	2.09 %	3.21 %
1993.3	4.05 %	7.26 %
1993.4	6.77 %	14.02 %
1994.1	10.15 %	24.17 %
1994.2	14.04 %	38.22 %
1994.3	17.54 %	55.75 %
1994.4	18.15 %	73.90 %
1995.1	15.11 %	89.01 %
1995.2	9.04 %	98.05 %
1995.3	1.95 %	100.00 %

Starting Year.Qrt = 1992.4
Curve Type = 9
Duration in Quarters = 12

Year.Qrt	Quantity In Quarter	Quantity Cumulative
1992.4	0.16 %	0.16 %
1993.1	0.62 %	0.78 %
1993.2	1.63 %	2.41 %
1993.3	3.27 %	5.68 %
1993.4	5.81 %	11.48 %
1994.1	9.13 %	20.61 %
1994.2	13.18 %	33.79 %
1994.3	17.45 %	51.24 %
1994.4	19.23 %	70.47 %
1995.1	16.75 %	87.22 %
1995.2	10.47 %	97.69 %
1995.3	2.31 %	100.00 %

Starting Year.Qrt = 1992.4
Curve Type = 10
Duration in Quarters = 12

Year.Qrt	Quantity In Quarter	Quantity Cumulative
1992.4	15.97 %	15.97 %
1993.1	14.58 %	30.56 %
1993.2	13.19 %	43.75 %
1993.3	11.81 %	55.56 %
1993.4	10.42 %	65.97 %
1994.1	9.03 %	75.00 %
1994.2	7.64 %	82.64 %
1994.3	6.25 %	88.89 %
1994.4	4.86 %	93.75 %
1995.1	3.47 %	97.22 %
1995.2	2.08 %	99.31 %
1995.3	0.69 %	100.00 %

Starting Year.Qrt = 1992.4
Curve Type = 15
Duration in Quarters = 12

Year.Qrt	Quantity In Quarter	Quantity Cumulative
1992.4	8.33 %	8.33 %
1993.1	8.33 %	16.67 %
1993.2	8.33 %	25.00 %
1993.3	8.33 %	33.33 %
1993.4	8.33 %	41.67 %
1994.1	8.33 %	50.00 %
1994.2	8.33 %	58.33 %
1994.3	8.33 %	66.67 %
1994.4	8.33 %	75.00 %
1995.1	8.33 %	83.33 %
1995.2	8.33 %	91.67 %
1995.3	8.33 %	100.00 %

Starting Year.Qrt = 1992.4
Curve Type = 20
Duration in Quarters = 12

Year.Qrt	Quantity In Quarter	Quantity Cumulative
1992.4	0.69 %	0.69 %
1993.1	2.08 %	2.78 %
1993.2	3.47 %	6.25 %
1993.3	4.86 %	11.11 %
1993.4	6.25 %	17.36 %
1994.1	7.64 %	25.00 %
1994.2	9.03 %	34.03 %
1994.3	10.42 %	44.44 %
1994.4	11.81 %	56.25 %
1995.1	13.19 %	69.44 %
1995.2	14.58 %	84.03 %
1995.3	15.97 %	100.00 %

APPENDIX B

CALCULATION OF ESCALATED COSTS

The purpose of this appendix is to describe how the Automated Estimating System (AES) calculates the escalated value of the estimates. The system calculates an average escalation factor for each Bill of Material in the data base. To calculate the escalated cost of a Bill of Material, the system multiplies the costs for that Bill of Material by the average escalation factor.

The average escalation factor for a Bill of Material is calculated in three steps. First, a table of quarterly escalation factors is calculated based on the base fiscal year and quarter of the project entered in the estimate record and the annual escalation rates entered in the Standard Value file. This table is created whenever an estimate is opened for updating or when the base fiscal year and quarter are entered in an estimate that is being created. The table is recreated whenever the base fiscal year and/or quarter of the estimate is changed. The escalation factors are calculated based on the following rules.

1. The base fiscal year and quarter and any preceding quarters have an escalation factor of 1.0.

2. The rates are compounded annually from the fourth quarter of each fiscal year.

The creation of the escalation factor table is best illustrated by example. Assume that the Standard Value file contains the annual escalation rates listed on page B-2 and that the estimate record contains a base fiscal year and quarter of 1992 quarter 4. The system calculates the escalation factors based on the following formula (X signifies multiplication):

Current Quarter Factor = (Previous fourth quarter factor) X (1 + (Sum of first through current quarter quarterly escalation rates))

where the quarterly escalation rate is the annual escalation rate (from the Standard Value file) divided by 4. In this example, the escalation factor for fiscal year 1992 quarter 4 would be 1.0, since this is this base fiscal year and quarter. The remaining quarterly factors are calculated by simply filling in the appropriate values in the above formula. For fiscal year 1993, quarter 1, the previous fourth quarter factor (from fiscal year 1992 quarter 4) is 1.0. The quarterly escalation rate is the annual escalation rate for 1993 (5.0) divided by 4, which yields .0125. Because this is the first quarter of the fiscal year, the sum of the first through the current quarter quarterly escalation rates is .0125. Placing these values in the formula results in the following:

1.012 = (1.0000) X (1 + (.0125)).

For fiscal year 1993, quarter 2, the only value that changes is the sum of the first through the current quarter quarterly escalation rates. This value, .0250, is the quarterly escalation rate for 1993 quarter 1 (.0125) plus the quarterly escalation rate for 1993 quarter 2 (.0125). Placing these values in the formula results in the following:

1.025 = (1.0000) X (1 + (.0125 + .0125)).

Escalation Rates

Fiscal Year	Escalation Rate
1992	5.0 %
1993	5.0 %
1994	6.0 %
1995	5.0 %
1996	6.0 %
1997	6.0 %
1998	6.0 %
1999	6.0 %
2000	6.0 %
2001	6.0 %

For the remaining two quarters of fiscal year 1993, the only value that changes is the sum of the escalation rates for the first through the current quarter. The results of placing the appropriate values in the formula is illustrated below for each of these quarters.

1993 quarter 3 1.037 = (1.0000) X (1 + (.0125 + .0125 + .0125))
1993 quarter 4 1.050 = (1.0000) X (1 + (.0125 + .0125 + .0125 + .0125))

The calculation of the escalation factors for fiscal year 1994 involves changing two of the formula values. The previous fourth quarter escalation factor (from 1993 quarter 4) becomes 1.0500. The quarterly escalation rate is the annual escalation rate for 1994 (6.0) divided by 4, which yields each of the quarters in fiscal year 1994, as illustrated below.

1994 quarter 1 1.066 = (1.0500) X (1 + (.0150))
1994 quarter 2 1.081 = (1.0500) X (1 + (.0150 + .0150))
1994 quarter 3 1.097 = (1.0500) X (1 + (.0150 + .0150 + .0150))
1994 quarter 4 1.113 = (1.0500) X (1 + (.0150 + .0150 + .0150 + .0150))

This formula produces the values depicted in column 4 of the table of escalation factors shown on page B-5.

The second step in the calculation of the average escalation factor is the retrieval of the percentage distribution of costs by quarter for the Bill of Material. The system retrieves the starting fiscal year and quarter and the duration in quarters from the project schedule file based on the Work Breakdown Structure (WBS) code and the participant code. The percentage distribution over this time period is determined by the curve type entered on the Bill of Material record. Appendix A contains a description of the available curve types and the methodology used in calculating the distribution. As an example, assume that the Bill of Material has a starting fiscal year and quarter of 1994 quarter 2, a duration of 6 quarters, and a curve type of 5. This information would produce the following distribution:

Year	Quarter	Percent
1994	2	3.27
1994	3	12.04
1994	4	23.55
1995	1	31.29
1995	2	23.82
1995	3	6.03

The final step in the calculation of the average escalation factor for the Bill of Material involves the combination of the information from the previous two steps. The percent in each fiscal year and quarter in the distribution is multiplied by the escalation factor for that fiscal year and quarter. The sum of these results is the average escalation rate for the Bill of Material. Using the escalation factors from the table on page B-5 and the percentage distribution from above would result in an average escalation factor of 1.124. This calculation is illustrated below.

Year	Quarter	Percent	Escalation Factor	Percent X Escalation Factor
1994	2	3.27	1.081	.035
1994	3	12.04	1.097	.132
1994	4	23.55	1.113	.262
1995	1	31.29	1.127	.353
1995	2	23.82	1.141	.272
1995	3	6.03	1.155	.070
			Average Escalation Factor	1.124

The average escalation factor is automatically calculated each time the WBS and/or participant code on the Bill of Material is changed. If the schedule is altered, the user must request that the average escalation factor be recalculated by choosing the Re-Calculate Estimate option on the Utility Menu screen.

ESCALATION MULTIPLIERS

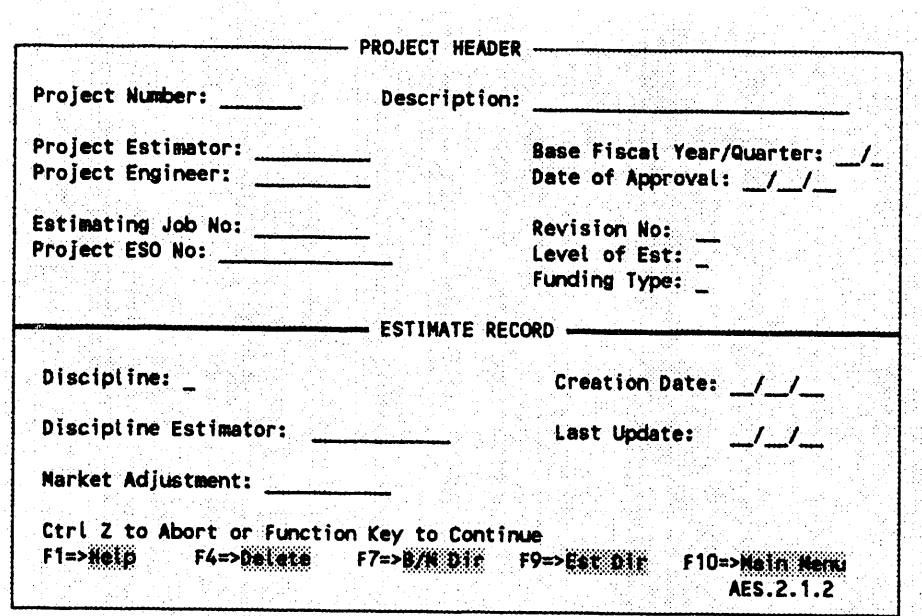
FY Escalated To	<---------- Fiscal Year Estimate Made ---------->																Escalation (%)
	92-1	92-2	92-3	92-4	93-1	93-2	93-3	93-4	94-1	94-2	94-3	94-4	95-1	95-2	95-3	95-4	
1992-1	1.000																5.0
1992-2	1.012	1.000															5.0
1992-3	1.025	1.012	1.000														5.0
1992-4	1.037	1.025	1.012	1.000													5.0
1993-1	1.050	1.038	1.025	1.012	1.000												5.0
1993-2	1.063	1.051	1.038	1.025	1.012	1.000											5.0
1993-3	1.076	1.063	1.050	1.037	1.025	1.012	1.000										5.0
1993-4	1.089	1.076	1.063	1.050	1.037	1.025	1.012	1.000									5.0
1994-1	1.106	1.092	1.079	1.066	1.053	1.040	1.028	1.015	1.000								6.0
1994-2	1.122	1.109	1.095	1.081	1.069	1.056	1.043	1.030	1.015	1.000							6.0
1994-3	1.138	1.125	1.111	1.097	1.084	1.071	1.058	1.045	1.030	1.015	1.000						6.0
1994-4	1.155	1.141	1.127	1.113	1.100	1.086	1.073	1.069	1.045	1.030	1.015	1.000					6.0
1995-1	1.169	1.155	1.141	1.127	1.113	1.100	1.087	1.073	1.058	1.043	1.028	1.015	1.000				5.0
1995-2	1.184	1.169	1.155	1.141	1.127	1.114	1.100	1.086	1.071	1.056	1.040	1.025	1.012	1.000			5.0
1995-3	1.198	1.184	1.169	1.155	1.141	1.127	1.113	1.100	1.084	1.069	1.053	1.037	1.025	1.012	1.000		5.0
1995-4	1.212	1.198	1.183	1.169	1.155	1.141	1.127	1.113	1.097	1.081	1.066	1.050	1.037	1.025	1.012	1.000	5.0
1996-1	1.231	1.216	1.201	1.186	1.172	1.158	1.144	1.130	1.114	1.098	1.082	1.066	1.053	1.040	1.028	1.015	6.0
1996-2	1.249	1.234	1.219	1.204	1.189	1.175	1.161	1.146	1.130	1.114	1.098	1.108	1.069	1.056	1.043	1.030	6.0
1996-3	1.267	1.252	1.237	1.221	1.207	1.192	1.178	1.163	1.147	1.130	1.114	1.097	1.084	1.071	1.058	1.045	6.0
1996-4	1.285	1.270	1.254	1.239	1.224	1.209	1.195	1.180	1.163	1.146	1.130	1.113	1.100	1.086	1.073	1.060	6.0
1997-1	1.305	1.289	1.273	1.257	1.242	1.227	1.212	1.197	1.181	1.164	1.147	1.130	1.116	1.103	1.089	1.076	6.0
1997-2	1.324	1.308	1.292	1.276	1.261	1.246	1.230	1.215	1.198	1.181	1.164	1.146	1.133	1.119	1.105	1.092	6.0
1997-3	1.343	1.327	1.311	1.295	1.279	1.264	1.248	1.233	1.215	1.198	1.181	1.163	1.149	1.135	1.122	1.108	6.0
1997-4	1.362	1.346	1.330	1.313	1.297	1.282	1.266	1.251	1.233	1.215	1.197	1.180	1.166	1.152	1.138	1.124	6.0
1998-1	1.383	1.366	1.349	1.333	1.317	1.301	1.285	1.269	1.251	1.233	1.215	1.197	1.183	1.169	1.155	1.140	6.0
1998-2	1.403	1.386	1.369	1.352	1.336	1.320	1.304	1.288	1.270	1.252	1.233	1.215	1.201	1.186	1.172	1.157	6.0
1998-3	1.424	1.406	1.389	1.372	1.356	1.340	1.323	1.307	1.288	1.270	1.251	1.233	1.218	1.204	1.189	1.174	6.0
1998-4	1.444	1.427	1.409	1.392	1.375	1.359	1.342	1.326	1.307	1.288	1.269	1.251	1.236	1.221	1.206	1.191	6.0
1999-1	1.466	1.448	1.430	1.413	1.396	1.379	1.362	1.345	1.326	1.307	1.288	1.269	1.254	1.239	1.223	1.209	6.0
1999-2	1.487	1.469	1.452	1.434	1.417	1.400	1.382	1.365	1.346	1.327	1.307	1.288	1.273	1.257	1.242	1.227	6.0
1999-3	1.509	1.491	1.473	1.455	1.437	1.420	1.403	1.385	1.366	1.346	1.326	1.307	1.291	1.276	1.260	1.245	6.0
1999-4	1.531	1.512	1.494	1.475	1.458	1.440	1.423	1.405	1.385	1.365	1.345	1.325	1.310	1.294	1.278	1.262	6.0
2000-1	1.554	1.535	1.516	1.498	1.480	1.462	1.444	1.425	1.406	1.386	1.366	1.345	1.329	1.313	1.297	1.281	6.0
2000-2	1.577	1.558	1.539	1.520	1.502	1.483	1.465	1.447	1.427	1.406	1.386	1.365	1.349	1.333	1.317	1.300	6.0
2000-3	1.600	1.580	1.561	1.542	1.523	1.505	1.487	1.468	1.448	1.427	1.406	1.385	1.369	1.352	1.336	1.319	6.0
2000-4	1.623	1.603	1.583	1.564	1.545	1.527	1.508	1.489	1.468	1.447	1.426	1.405	1.388	1.372	1.355	1.338	6.0
2001-1	1.647	1.627	1.607	1.587	1.568	1.550	1.531	1.512	1.490	1.469	1.448	1,426	1.409	1.392	1.375	1.358	6.0
2001-2	1.671	1.651	1.631	1.611	1.592	1.572	1.553	1.534	1,512	1.491	1.468	1.447	1.430	1.413	1.396	1.378	6.0
2001-3	1.696	1.675	1.655	1.634	1.615	1.595	1.576	1.556	1.534	1.512	1.490	1.468	1.451	1.433	1.416	1.398	6.0
2001-4	1.720	1.699	1.678	1.658	1.638	1.618	1.599	1.579	1.556	1.534	1.512	1.489	1.472	1.454	1.436	1.419	6.0

APPENDIX C

SCREEN LAYOUTS AND FIELD DEFINITIONS

This appendix contains the screen layouts and field definitions for each input screen in the Automated Estimating System. The layouts and field definition for each screen appear on the following pages:

Estimate Screen (AES.2.1.2)



D A T A D I C T I O N A R Y

Automated Estimating System
Estimate Screen (AES.2.1.2)

08/19/92

Item No.	Data Item Nomenclature	Data Requirement Description	Source of Data	Value or Range	Type	Field Size	Align	Retrieval Key
1	Project Number - ProjNo	A unique number assigned to each project. REQUIRED FIELD.	Discipline Estimator		Char	8	left	
2	Description - ProjDes	Describes the project being performed.	Discipline Estimator		Char	30		
3	Project Estimator - ProjEst	Name of the Project Estimator.	Discipline Estimator		Char	10		
4	Project Engineer - ProjEng	Name of the Project Engineer.	Discipline Estimator		Char	10		
5	Base Fiscal Year and Quarter - FisYrMo	Fiscal year and quarter for which dollars are entered. Field is used in calculating the average escalation rate. REQUIRED FIELD.	Discipline Estimator	YYQ	Char	3		
6	Date of Approval - DateApp	Date of Approval by Estimating. (mm/dd/yy)	Discipline Estimator		Char	8		
7	Estimating Job Number - EstNo	Work Order Number.	Discipline Estimator		Char	10		
8	Project ESO Number - EsoNo	The engineering service order number.	Discipline Estimator		Char	17		
9	Revision Number - RevNo	Number or letter indicating the version of the project estimate. REQUIRED FIELD.	Discipline Estimator		Char	2		
10	Level of Estimate - LevEst	Code representing the level of design on which the estimate is based. REQUIRED FIELD. P = Planning/Feasibility C = CDR 1 = Title I 2 = Title II E = Engineer's	Discipline Estimator	P,C,1,2 E	Char	1		
11	Funding Type - FundTy	Code representing the type of funding. REQUIRED FIELD. E = Expense L = Line Item G = GPP C = Capital Equipment	Discipline Estimator	E,L,G,C	Char	1		

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DATA DICTIONARY

Automated Estimating System
Estimate Screen (AES.2.1.2)

08/19/92

Item No.	Data Item Nomenclature	Data Requirement Description	Source of Data	Value or Range	Type	Field Size	Align	Retrieval Key
12	Discipline Code - Dis	Code representing the Engineering Discipline for this estimate. Must be a valid code from the "Standard Value File." REQUIRED FIELD.	Discipline Estimator		Char	1		Y
13	Discipline Estimator - DisEst	Name of the Discipline Estimator.	Discipline Estimator		Char	10		
14	Market Adjustment - MrtAdj	Dollar amount representing a "below the line" adjustment to the total cost.	Discipline Estimator	>= 0	Real	8		
15	Creation Date - CreaDate	Date when estimate was created. Date is generated by system.	System		Char	8		
16	Last Update Date - LastUD	System generated date of the last update to the estimate.	System		Char	8		

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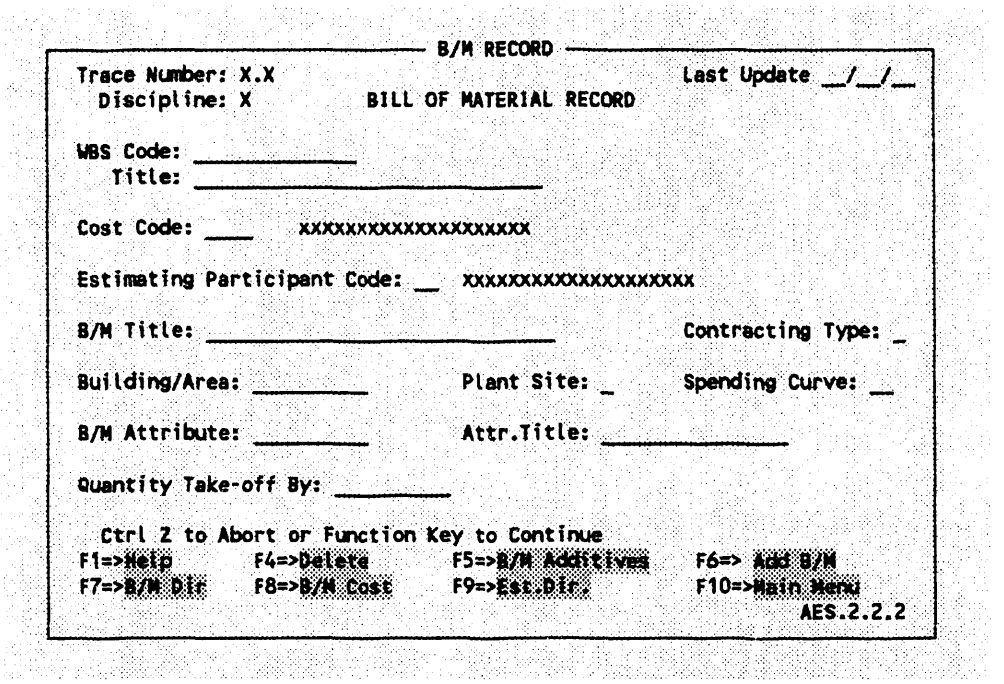
Bill of Material Record Screen (AES.2.2.2)



DATA DICTIONARY

Automated Estimating System
Bill of Material Screen (AES.2.2.2)

08/19/92

Item No.	Data Item Nomenclature			Data Requirement Description	Source of Data	Value or Range	Type	Field Size	Align	Retrieval Key
1	WBS Code	-	WBS	Work Breakdown Structure. REQUIRED FIELD.	Discipline Estimator		Char	14	Left	Y
2	WBS Title	-	WBSDesc	The title describing the work associated with the WBS Number.	Disc.Estimator WBS Title File		Char	30		
3	Cost Code	-	CostCode	Valid cost code from DOE Cost Code of Accounts. Validated from "Standard Value File." REQUIRED FIELD.	Discipline Estimator		Char	4		
4	Participant Code	-	Part	Code representing the participant doing the work. Validated from "Standard Value File." REQUIRED FIELD.	Discipline Estimator		Char	2	left	Y
5	B/M Title	-	BMDes	Field which can be used to describe the bill of material.	Discipline Estimator		Char	30		
6	Contractor Type	-	ContrTY	(G) General Contractor or (S) Subcontractor. REQUIRED FIELD.	Discipline Estimator	G, S	Char	1		
7	Building Number	-	BuildCod	From EMIS building codes.	Discipline Estimator		Char	10		
8	Plant Site	-	PlantSit	Code to indicate the plant site: K - K-25 Y - Y-12 X - X-10 O - Other	Discipline Estimator	K,Y,X,O	Char	1		
9	Spending Curve	-	SpendCur	Code to indicate the type of spending curve to be used in reporting cost. REQUIRED FIELD. 5: Curve with a bell-like shape. 1-4,6-9: Curve that applies varying degrees of skewness to 5. 10: A linearly descending allocation over the time period. 15: A uniform allocation over the time period. 20: A linearly ascending allocation over the time period.	Discipline Estimator	1-10, 15, 20	Int	2		
10	B/M Attribute	-	BMAttr	Bill of Material Attribute. This field is user defined.	Discipline Estimator		Char	15		
11	B/M Attribute Title	-	AttrTitl	Title describing the B/M attribute.	Discipline Estimator		Char	30		
12	Quantity Take-Off By	-	TakeOff	Name of person who created the material take-off.	Discipline Estimator		Char	10		

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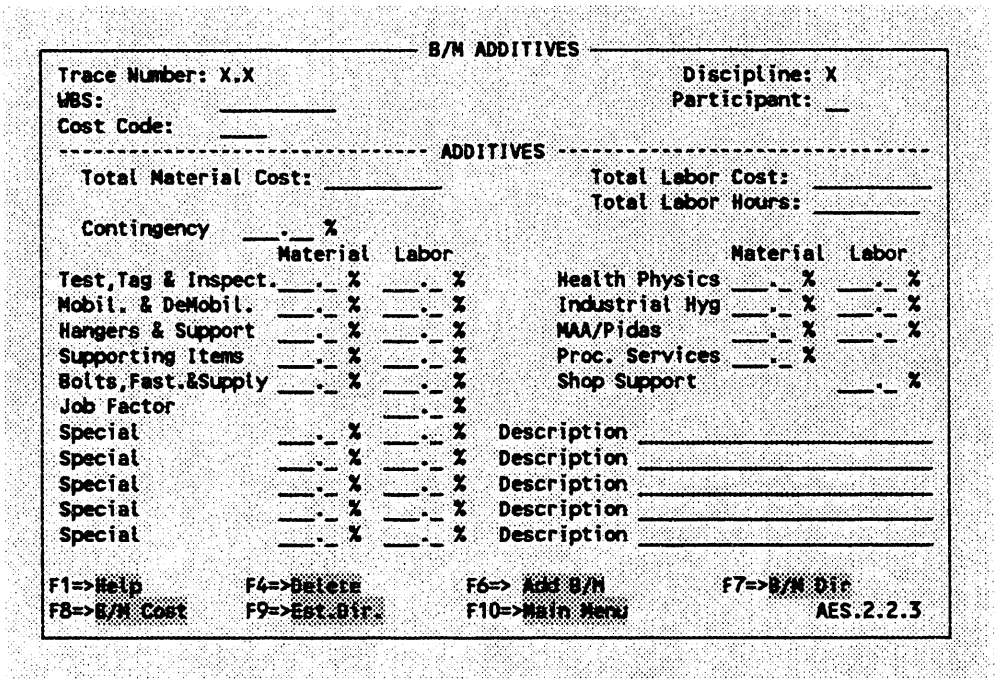
Bill of Material Additive Screen (AES.2.2.3)



D A T A D I C T I O N A R Y

Automated Estimating System
Bill of Material Additive Screen
(AES.2.2.3)
08/19/92

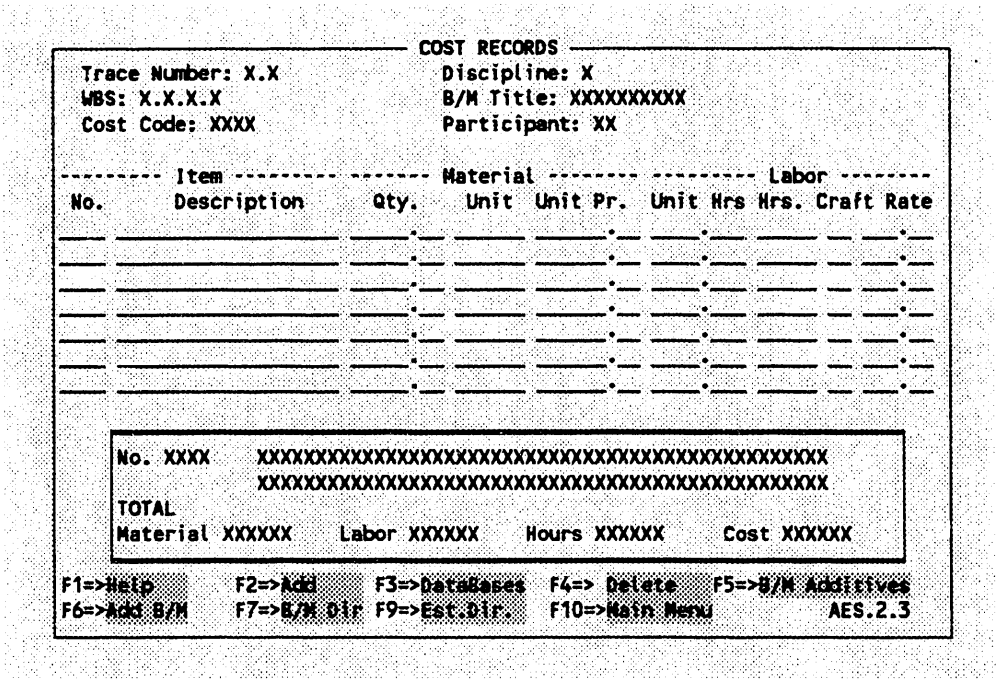
Item No.	Data Item Nomenclature		Data Requirement Description	Source of Data	Value or Range	Type	Field Size	Align	Retrieval Key
1	Contingency Additive	- ContAdd	Percentage mark-up value applied to material and labor cost for contingency.	Disc.Estimator Cont.WS File		Int			
2	Test,Tag and Inspect Additive	- MisAddi1	Test, Tag and Inspection percentage mark-up to be applied to material and/or labor.	Discipline Estimator		Int			
3	Mobil. & Demobil Additive	- MisAddi2	Mobilization and Demobilization percentage mark-up value applied to material and/or labor.	Discipline Estimator		Int			
4	Hangers & Support Additive	- MisAddi3	Hangers and Support percentage mark-up value to be applied to material and/or labor.	Discipline Estimator		Int			
5	Supporting Items Additive	- MisAddi4	Supporting Items percentage mark-up value to be applied to material and/or labor.	Discipline Estimator		Int			
6	Bolts,Fasteners & Supplies Additive	- MisAddi5	Bolts, Fasteners and Supplies percentage mark-up value to be applied to material and/or labor.	Discipline Estimator		Int			
7	Job Factor	- JobFac	Job Factor percentage mark-up applied to labor cost.	Discipline Estimator		Int			
8	Health Physics Additive	- HP	Health Physics percentage mark-up value to be applied to material and/or labor.	Discipline Estimator		Int			
9	Industrial Hygiene Additive	- IH	Industrial Hygiene percentage mark-up value to be applied to material and/or labor.	Discipline Estimator		Int			
10	MAA/Pidas Additive	- MAA	MAA percentage mark-up value to be applied to material and/or labor.	Discipline Estimator		Int			
11	Procurement Service Additive	- ProcSer	Procurement Service percentage mark-up value to be applied to material cost.	Discipline Estimator		Int			
12	Shop Support	- ShopSup	Percentage mark-up applied for Shop Support.	Discipline Estimator		Int			
13	Special Additive # 1	- SpecAdd1	Project specific percentage mark-up value to be applied to material and/or labor.	Discipline Estimator		Int			
14	Special Desc. # 1	- SpecDes1	Description of the Special Additive. Required if Special Additives are used.	Discipline Estimator		Char	25		
15	Special Additive # 2	- SpecAdd2	Project specific percentage mark-up value to be applied to material and/or labor.	Discipline Estimator		Int			

D A T A D I C T I O N A R Y

Automated Estimating System
Bill of Material Additive Screen
(AES.2.2.3)
08/19/92

Item No.	Data Item Nomenclature	Data Requirement Description	Source of Data	Value or Range	Type	Field Size	Align	Retrieval Key
16	Special Desc. # 2 - SpecDes2	Description of Special Additive. Required if Special Additives are used.	Discipline Estimator		Char	25		
17	Special Additive # 3 - SpecAdd3	Project specific percentage mark-up value to be applied to material and/or labor.	Discipline Estimator		Int			
18	Special Desc. # 3 - SpecDes3	Description of the Special Additive. Required if Special Additives are used.	Discipline Estimator		Char	25		
19	Special Additive # 4 - SpecAdd4	Project specific percentage mark-up value to be applied to material and/or labor.	Discipline Estimator		Int			
20	Special Desc. # 4 - SpecDes4	Description of the Special Additive. Required if Special Additives are used.	Discipline Estimator		Char	25		
21	Special Additive # 5 - SpecAdd5	Project specific percentage mark-up value to be applied to material and/or labor.	Discipline Estimator		Int			
22	Special Desc. # 5 - SpecDes5	Description of the Special Additive. Required if Special Additives are used.	Discipline Estimator		Char	25		

Bill of Material Cost Screen (AES.2.3)



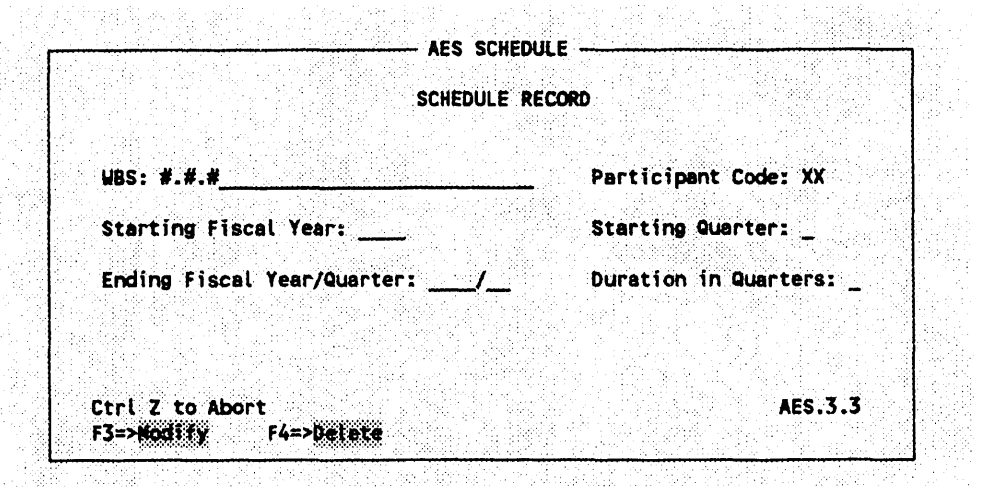
D A T A D I C T I O N A R Y

Automated Estimating System
Bill of Material Cost Screen (AES.2.3)

08/19/92

Item No.	Data Item Nomenclature	Data Requirement Description	Source of Data	Value or Range	Type	Field Size	Align	Retrieval Key
1	Item Number - ItemNo	Alphanumeric field that contains a number or letter to identify each line item.	Discipline Estimator		Char	4		
2	Item Description - ItemDes	Used to describe the activity being performed, material being procured, equipment being installed, or other activity.	Discipline Estimator		Char	100		
3	Material Quantity - MatQty	Quantity of material that will be multiplied by unit cost to get total material cost.	Discipline Estimator		Real	8 (5.2)		
4	Material Unit - MatUnit	Indicates the units of material such as square yards, cubic yards, etc.	Discipline Estimator		Char	6		
5	Material Unit Price - MatPrice	Cost per unit of material.	Discipline Estimator		Real	9 (6.2)		
6	Labor Hours - LaborHrs	Man-hours necessary to perform the described task.	Discipline Estimator		Real	5 (5.0)		
7	Labor Craft - LaborTY	Code indicating the labor type necessary to perform the indicated task.	Discipline Estimator		Char	2		Y
8	Labor Rate - LaborRT	The hourly labor rate (retrieved from the "Standard Value File") based on the Labor Craft and Participant Code.	Standard Value File		Real	6 (3.2)		

Schedule Records Screen (AES.3.3)



D A T A D I C T I O N A R Y

Automated Estimating System
Schedule Screen (AES.3.3)

08/19/92

Item No.	Data Item Nomenclature	Data Requirement Description	Source of Data	Value or Range	Type	Field Size	Align	Retrieval Key
1	WBS Code - WBS	Work Breakdown Structure. REQUIRED FIELD.	Scheduler		Char	32	Left	Y
2	Participant Code - Part	Participant Code used to uniquely identify an estimating participant. REQUIRED FIELD.	Scheduler		Char	2		Y
3	Starting Fiscal Year - StartYr	Fiscal Year that work associated with the WBS code - Participant is scheduled to begin. REQUIRED FIELD.	Scheduled		Int			
4	Starting Quarter - StartQrt	Quarter that work associated with the WBS - Participant is scheduled to begin. REQUIRED FIELD.	Scheduler		Int			
5	Ending Fiscal Year Quarter - EndYr	Fiscal year and quarter that work associated with WBS number and Participant code is scheduled to be completed.	Scheduler		Int	5		
6	Duration in Quarters - Duration	Number of quarters required to complete work associated with the WBS-Participant code. If schedule enters the ending year/quarter this value is calculated by the system.	System or Scheduler		Int			

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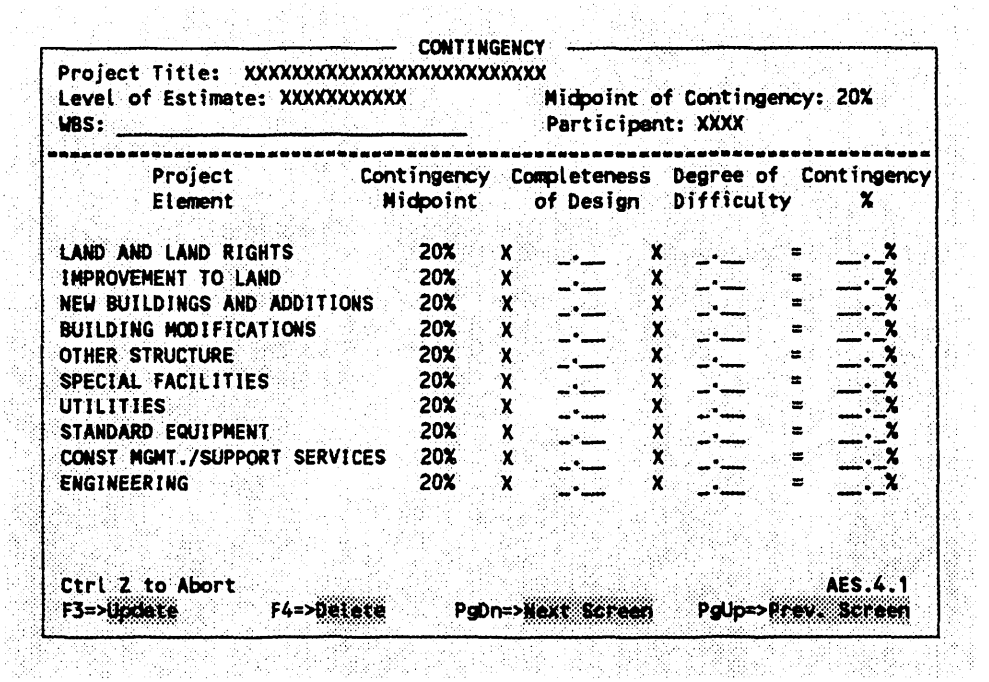
Contingency Screen (AES.4.1)



CONTINGENCY

Project Title: XXXXXXXXXXXXXXXXXXXXXXXXX
Level of Estimate: XXXXXXXXXXX Midpoint of Contingency: 20%
WBS: _____ Participant: XXXX

Project Element	Contingency Midpoint		Completeness of Design		Degree of Difficulty		Contingency %
LAND AND LAND RIGHTS	20%	X	_.__	X	_.__	=	__._%
IMPROVEMENT TO LAND	20%	X	_.__	X	_.__	=	__._%
NEW BUILDINGS AND ADDITIONS	20%	X	_.__	X	_.__	=	__._%
BUILDING MODIFICATIONS	20%	X	_.__	X	_.__	=	__._%
OTHER STRUCTURE	20%	X	_.__	X	_.__	=	__._%
SPECIAL FACILITIES	20%	X	_.__	X	_.__	=	__._%
UTILITIES	20%	X	_.__	X	_.__	=	__._%
STANDARD EQUIPMENT	20%	X	_.__	X	_.__	=	__._%
CONST MGMT./SUPPORT SERVICES	20%	X	_.__	X	_.__	=	__._%
ENGINEERING	20%	X	_.__	X	_.__	=	__._%

Ctrl Z to Abort AES.4.1
F3=>Update F4=>Delete PgDn=>Next Screen PgUp=>Prev. Screen

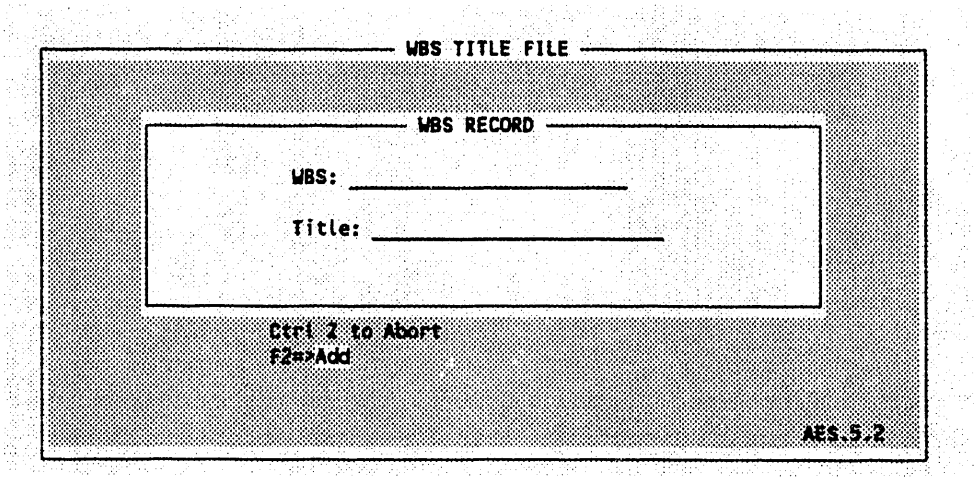
D A T A D I C T I O N A R Y

Automated Estimating System
Contingency Screen (AES.4.1)

08/19/92

Item No.	Data Item Nomenclature			Data Requirement Description	Source of Data	Value or Range	Type	Field Size	Align	Retrieval Key
1	WBS	-	WBS	The WBS code for which contingency is being calculated.	Discipline Estimator		Char	32	Left	Y
2	Participant Group	-	Part	Participant Group for which contingency is being calculated.	Discipline Estimator		Char	10		Y
3	Cost Code	-	CC	Cost Code for which contingency is being calculated.	Discipline Estimator		Char	4		Y
4	Midpoint of Contingency	-	MidPt	Midpoint of contingency range based on the level of estimate.	System		Real			
5	Completeness of Design	-	CompDesg	The given stage of design for a given project element.	Discipline Estimator		Real			
6	Degree of Difficulty	-	DefDiff	Refers to those factors that greatly increase the cost estimating risk for a given project element.	Discipline Estimator		Real			
7	Contingency Percentage	-	ContPer	Percent Contingency to be applied for a given WBS/Participant Group/Cost Code.	Estimating System		Real			

WBS Title Screen (AES.5.2)



D A T A D I C T I O N A R Y

Automated Estimating System
WBS Title Screen (AES.5.2)

08/19/92

Item No.	Data Item Nomenclature	Data Requirement Description	Source of Data	Value or Range	Type	Field Size	Align	Retrieval Key
1	WBS Code - WBSCode	The WBS Code for the WBS record that is being entered.	Project Estimator		Char	32	Left	Y
2	WBS Title - WBSTitle	The WBS Title associated with the WBS code entered.	Project Estimator		Char	30		

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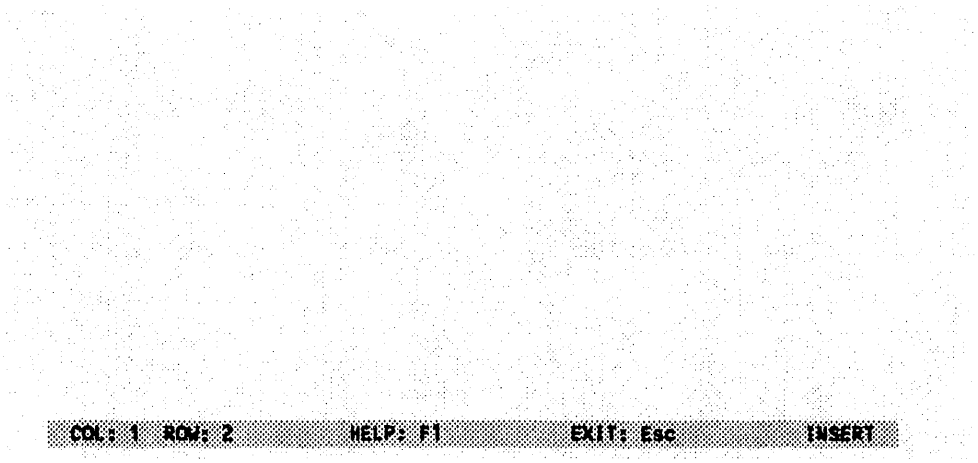
Bases of Estimate Screen



APPENDIX D

EXAMPLES OF REPORTS PRODUCED BY AES

The purpose of this appendix is to show an example of each type of report produced by the Automated Estimating System. These examples appear on the following pages:

DETAIL REPORT

Project Number: 1
SAMPLE - AES 5.1

Project ESO Number.....A-DDDDD-A1
Revision Number.....1
Last Update.....08/11/92

Approved by:

Project Estimator	Date
Estimating Manager	Date

AES Version 5.1
Base Fiscal Year/Quarter: 92/1
STANDARD VALUE: ORMAY92.val EXPIRES: 8/15/93
ESTIMATE FILE: R:\SAMPLE\SAMPLE.est 08/11/92
SCHEDULE FILE: SAMPLE
REPORT FILE : R:\SAMPLE\DETAIL.out 08/12/92 08:57:14

SAMPLE - AES 5.1

Creation Date 01/05/88
Revision Number ... 1

Estimating Job Number ..

Project Estimator.. K.P.RICE
WBS ..... 1.1 Construction
Cost Code ..... 9000 CONST MGMT/SUPPORT SERVICES
Participant ..... 66 MK-F INDIRECTS ON FP
Contracting Type .. G

Project Engineer ..... J.J.SMITH
Building/Area 3038
Plant Site X
Level of Estimate 1
Funding Type ..... EXPENSE

B/M Attribute ..... CA01 DEMOLITION

Discipline ..... C Civil and Site
B/M Title ..... DEMOLITION

Discipline Estimator ... A.D.SMITH
Quantity Take-Off By ...
Trace Number C.1.1 15
Expiration Date: 8/15/93

Standard Value File ORMAY92.val
Estimate File: R:\SAMPLE\SAMPLE.est 8-11-92 3:23p

ITEM	DESCRIPTION	MATERIAL				LABOR				TOTAL COST M + L
		Qty.	Unit	Unit Pr.	Total	Hours	Cft.	Rate	Total	
1	DEMOLISH ABOUT 20' OF EXISTING CONTAMINATED PIPE 1 1/2"	20.00	LF	0.00	0	9	PF	0.00	0	0
2	PACKAGE PIPE FOR DISPOSAL IN STEEL DRUMS, STEEL DRUM PRICE $70/DRUM	1.00	LOT	140.00	140	9	L	0.00	0	140
****	SUBTOTAL ****				140	18			0	140
3	DRILL HOLES THRU WALLS FOR PIPE, CONCRETE WALLS 10", 14", 8", 8" THICK, FOR 1 1/2" PIPE	4.00	EA	25.00	100	18	L	0.00	0	100
4	BAG DEBRIS FROM CORE DRILLS FOR DISPOSAL	1.00	LOT	20.00	20	9	L	0.00	0	20
5	TRAVEL TIME LOSS	1.00	LOT	0.00	0	5	L	0.00	0	0
6	SUPPORTING ITEMS, BREAKAGE, & WASTE	1.00	LOT	13.00	13	0		0.00	0	13
7	SHOP SUPPORT FOR FIELD	0.00		0.00	0	0		0.00	0	0
8	CLEANUP	0.00		0.00	0	0		0.00	0	0
TOTAL INDIRECT					273				0	273
TOTAL					273	50			0	273

SCHEDULE 1-B-7a

Project Number: 1
SAMPLE - AES 5.1

Project ESO Number.....A-DDDDD-A1
Revision Number.....1
Last Update.....08/11/92

Approved by:

_____ _____
Project Estimator Date

_____ _____
Estimating Manager Date

AES Version 5.1
Base Fiscal Year/Quarter: 92/1
STANDARD VALUE: ORMAY92.val EXPIRES: 8/15/93
ESTIMATE FILE: R:\SAMPLE\SAMPLE.est 08/11/92
SCHEDULE FILE: SAMPLE
REPORT FILE : R:\SAMPLE\1B7A.out 08/12/92 08:57:25

SAMPLE - AES 5.1
WBS: 1

SCHEDULE 1-B-7a
ESCALATED DOLLARS

	Participants					
	MMES	A-E	FP	MK-F	OTHER	TOTAL
I. ENGINEERING	21740	.	.	.	.	21740
II. CONSTRUCTION						
LAND AND LAND RIGHTS	.	.	.	.	.	0
IMPROVEMENT TO LAND	.	.	.	.	.	0
NEW BUILDINGS AND ADDITIONS	.	.	2959	.	.	2959
BUILDING MODIFICATIONS	.	.	.	.	.	0
OTHER STRUCTURE	.	.	.	.	.	0
SPECIAL FACILITIES	6009	.	.	96389	.	102398
UTILITIES	.	.	.	.	.	0
PROJECT MANAGEMENT	31486	.	.	.	.	31486
CONSTRN MANAGEMENT	.	.	.	2226	.	2226
TOTAL CONSTRUCTION	37495	.	2959	98615	.	139069
III. STANDARD EQUIPMENT	.	.	.	.	.	0
SUBTOTAL	59235	.	2959	98615	.	160809
IV. CONTINGENCY	6494	.	376	20597	.	27467
GRAND TOTAL	65729	.	3335	119212	.	188276

Engineering as a percent of Construction is : 15.70%

The overall distributed Contingency is : 17.08%

Ratio of escalated to unescalated total cost: 1.07

LABOR ANALYSIS

Project Number: 1
SAMPLE - AES 5.1

Project ESO Number.....A-DDDDD-A1
Revision Number.....1
Last Update.....08/11/92

Sort Order
1. Participant

Approved by:

_____ _____
Project Estimator Date

_____ _____
Estimating Manager Date

AES Version 5.1
Base Fiscal Year/Quarter: 92/1
STANDARD VALUE: ORMAY92.val EXPIRES: 8/15/93
ESTIMATE FILE: R:\SAMPLE\SAMPLE.est 08/11/92
SCHEDULE FILE: SAMPLE
REPORT FILE : R:\SAMPLE\LABANY.out 08/12/92 08:57:46

SAMPLE - AES 5.1

LABOR ANALYSIS

08/12/92

		Labor Hours	Unescalated Labor $	Escalated Labor $
11	MMES TITLE I & II ENGR.	296	16280	17130
13	MMES TITLE III ENGR.	68	3740	3957
21	MMES PROCUREMENT	50	0	0
41	MMES FIELD MAINTENANCE	40	1464	1549
48	MMES A-E SUPPORT	209	0	0
49	MMES PROJECT SERVICES	445	12980	13658
51	FIXED PRICE CONSTRUCTION	66	1637	1732
63	MK-F DIRECT HIRE	1487	57160	61819
66	MK-F INDIRECTS ON FP	100	0	0
67	MK-F DIRECTS ON FP	353	0	0
SUB - TOTAL		3114	93261	99845
CONTINGENCY			17395	18664
GRAND TOTAL		3114	110656	118509

SUMMARY REPORT

Project Number: 1
SAMPLE - AES 5.1

Project ESO Number.....A-DDDDD-A1
Revision Number.....1
Last Update.....08/11/92

Sort Order
1. Cost Code
2. Participant

Approved by:

Project Estimator	Date
Estimating Manager	Date

AES Version 5.1
Base Fiscal Year/Quarter: 92/1
STANDARD VALUE: ORMAY92.val EXPIRES: 8/15/93
ESTIMATE FILE: R:\SAMPLE\SAMPLE.est 08/11/92
SCHEDULE FILE: SAMPLE
REPORT FILE : R:\SAMPLE\SUMMARY.out 08/12/92 08:58:36

SAMPLE - AES 5.1

SUMMARY REPORT

08/12/92

Arranged By: Cost Code / Participant

		Unescalated			Escalated		
		Material $	Labor $	Total $	Material $	Labor $	Total $
3000	NEW BUILDINGS AND ADDITIONS						
51	FIXED PRICE CONSTRUCTION	1160	1637	2797	1227	1732	2959
TOTAL	NEW BUILDINGS AND ADDITIONS	1160	1637	2797	1227	1732	2959
6000	SPECIAL FACILITIES						
21	MMES PROCUREMENT	304	0	304	323	0	323
41	MMES FIELD MAINTENANCE	3910	1464	5374	4137	1549	5686
63	MK-F DIRECT HIRE	32056	57160	89216	34570	61819	96389
TOTAL	SPECIAL FACILITIES	36270	58624	94894	39030	63368	102398
9000	CONST MGMT/SUPPORT SERVICES						
48	MMES A-E SUPPORT	8243	0	8243	8721	0	8721
49	MMES PROJECT SERVICES	8643	12980	21623	9107	13658	22765
66	MK-F INDIRECTS ON FP	546	0	546	579	0	579
67	MK-F DIRECTS ON FP	1563	0	1563	1647	0	1647
TOTAL	CONST MGMT/SUPPORT SERVICES	18995	12980	31975	20054	13658	33712
9999	ENGINEERING						
11	MMES TITLE I & II ENGR.	505	16280	16785	531	17130	17661
13	MMES TITLE III ENGR.	115	3740	3855	122	3957	4079
TOTAL	ENGINEERING	620	20020	20640	653	21087	21740
SUB - TOTAL		57045	93261	150306	60964	98845	160809
CONTINGENCY		8201	17395	25596	8815	18664	27479
GRAND TOTAL		65246	110656	175902	69778	118509	188288

CONTINGENCY SUMMARY

Project Number: 1
SAMPLE - AES 5.1

Project ESO Number.....A-DDDDD-A1
Revision Number.....1
Last Update.....08/11/92

Sort Order
1. Cost Code
2. Participant

Approved by:

Project Estimator _____ Date _____

Estimating Manager _____ Date _____

AES Version 5.1
Base Fiscal Year/Quarter: 92/1
STANDARD VALUE: ORMAY92.val EXPIRES: 8/15/93
ESTIMATE FILE: R:\SAMPLE\SAMPLE.est 08/11/92
SCHEDULE FILE: SAMPLE
REPORT FILE : R:\SAMPLE\contingency.out 08/12/92 08:58:59

SAMPLE - AES 5.1

CONTINGENCY REPORT

08/12/92

Arranged By: Cost Code / Participant Code

		Escalated					
		Material $	Labor $	Sub-Total $	-- Contingency -- $	%	Total $
3000	NEW BUILDINGS AND ADDITIONS						
51	FIXED PRICE CONSTRUCTION	1227	1732	2959	376	12.69	3335
TOTAL	NEW BUILDINGS AND ADDITIONS	1227	1732	2959	376	12.69	3335
6000	SPECIAL FACILITIES						
21	MMES PROCUREMENT	323	0	323	68	21.05	391
41	MMES FIELD MAINTENANCE	4137	1549	5686	1200	21.10	6886
63	MK-F DIRECT HIRE	34570	61819	96389	20336	21.10	116725
TOTAL	SPECIAL FACILITIES	39030	63368	102398	21604	21.10	124002
9000	CONST MGMT/SUPPORT SERVICES						
48	MMES A-E SUPPORT	8721	0	8721	0	0.00	8721
49	MMES PROJECT SERVICES	9107	13658	22765	2055	9.03	24820
66	MK-F INDIRECTS ON FP	579	0	579	92	15.93	671
67	MK-F DIRECTS ON FP	1647	0	1647	175	10.62	1822
TOTAL	CONST MGMT/SUPPORT SERVICES	20054	13658	33712	2322	6.89	36034
9999	ENGINEERING						
11	MMES TITLE I & II ENGR.	531	17130	17661	2578	14.60	20240
13	MMES TITLE III ENGR.	122	3957	4079	596	14.60	4675
TOTAL	ENGINEERING	653	21087	21740	3175	14.60	24915
GRAND TOTAL		60964	99845	160809	27477	17.09	188286

COST SCHEDULE SUMMARY

Project Number: 1
SAMPLE - AES 5.1

Project ESO Number.....A-DDDDD-A1
Revision Number.....1
Last Update.....08/11/92

Approved by:

Project Estimator	Date
Estimating Manager	Date

AES Version 5.1
Base Fiscal Year/Quarter: 92/1
STANDARD VALUE: ORMAY92.val EXPIRES: 8/15/93
ESTIMATE FILE: R:\SAMPLE\SAMPLE.est 08/11/92
SCHEDULE FILE: SAMPLE
REPORT FILE : R:\SAMPLE\CSTSCH.out 08/12/92 08:59:11

COST SCHEDULE

$1 X $1

Date: 12-Aug-92

PROJECT: SAMPLE - AES 5.1
WBS: 1

	FISCAL YEAR					Sub Total
	1991	1992	1993	1994	1995	
ENGINEERING						
TITLE I & II						
MMES TITLE I & II ENGR.	.	1653	9606	6401	.	17660
TITLE III						
MMES TITLE III ENGR.	.	311	1870	1852	46	4079
TOTAL ENGINEERING	.	1964	11476	8253	46	21739
CONSTRUCTION						
MMES						
MMES PROCUREMENT	.	21	124	162	17	324
MMES FIELD MAINTENANCE	.	433	2606	2582	64	5685
MMES A-E SUPPORT	.	665	3998	3961	98	8722
MMES PROJECT SERVICES	.	2384	11768	8527	85	22764
FP						
FIXED PRICE CONSTRUCTION	.	226	1357	1344	33	2960
MK-F						
MK-F DIRECT HIRE	175	4911	23480	43776	23538	95880
MK-F INDIRECTS ON FP	.	60	235	259	25	579
MK-F DIRECTS ON FP	.	202	780	649	16	1647
TOTAL CONSTRUCTION	175	8902	44348	61260	23876	138561
TOTAL	175	10866	55824	69513	23922	160300
CONTINGENCY	37	1670	8612	12042	4999	27360
GRAND TOTAL	212	12536	64436	81555	28921	187660

COST SCHEDULE

$1 X $1

Date: 12-Aug-92

PROJECT: SAMPLE - AES 5.1
WBS: 1

	FISCAL YEAR					
	1996	1997	1998	1999	2000	Total
ENGINEERING						
TITLE I & II						
MMES TITLE I & II ENGR.	.	.	.	.	.	17660
TITLE III						
MMES TITLE III ENGR.	.	.	.	.	.	4079
TOTAL ENGINEERING	.	.	.	.	.	21739
CONSTRUCTION						
MMES						
MMES PROCUREMENT	.	.	.	.	.	324
MMES FIELD MAINTENANCE	.	.	.	.	.	5685
MMES A-E SUPPORT	.	.	.	.	.	8722
MMES PROJECT SERVICES	.	.	.	.	.	22764
FP						
FIXED PRICE CONSTRUCTION	.	.	.	.	.	2960
MK-F						
MK-F DIRECT HIRE	507	.	.	.	.	96387
MK-F INDIRECTS ON FP	.	.	.	.	.	579
MK-F DIRECTS ON FP	.	.	.	.	.	1647
TOTAL CONSTRUCTION	507	.	.	.	.	139068
TOTAL	507	.	.	.	.	160807
CONTINGENCY	107	.	.	.	.	27467
GRAND TOTAL	614	.	.	.	.	188274

WBS/PARTICIPANT SUMMARY

Project Number: 1
SAMPLE - AES 5.1

Project ESO Number.....A-DDDDD-A1
Revision Number.....1
Last Update.....08/11/92

Approved by:

Project Estimator _____ Date _____

Estimating Manager _____ Date _____

AES Version 5.1
Base Fiscal Year/Quarter: 92/1
STANDARD VALUE: ORMAY92.val EXPIRES: 8/15/93
ESTIMATE FILE: R:\SAMPLE\SAMPLE.est 08/11/92
SCHEDULE FILE: SAMPLE
REPORT FILE : R:\SAMPLE\wbspart.out 08/12/92 08:59:31

ESCALATED DOLLARS

S1 X S1

PROJECT: SAMPLE - AES 5.1

Date: 12-Aug-92

	Participants				
	MMES	A-E	FP	MK-F	OTHER	TOTAL
ENGINEERING						
TITLE I & II	17661	.	.	.	.	17661
TITLE III	4079	.	.	.	.	4079
TOTAL ENGINEERING	21740	.	.	.	.	21740
CONSTRUCTION						
Construction	23417	.	2959	39800	.	66176
Engineering	.	.	.	58814	.	58814
Construction Management	14078	.	.	.	.	14078
TOTAL CONSTRUCTION	37495	.	2959	98614	.	139068
TOTAL	59235	.	2959	98614	.	160808
CONTINGENCY	6494	.	376	20597	.	27467
GRAND TOTAL	65729	.	3335	119211	.	188275

FISCAL YEAR SUMMARY

Project Number: 1
SAMPLE - AES 5.1

Project ESO Number.....A-DDDDD-A1
Revision Number.....1
Last Update.....08/11/92

Approved by:

Project Estimator	Date
Estimating Manager	Date

AES Version 5.1
Base Fiscal Year/Quarter: 92/1
STANDARD VALUE: ORMAY92.val EXPIRES: 8/15/93
ESTIMATE FILE: R:\SAMPLE\SAMPLE.est 08/11/92
SCHEDULE FILE: SAMPLE
REPORT FILE : R:\SAMPLE\FYSUM.out 08/12/92 09:00:25

FISCAL YEAR SUMMARY

$1 X $1

Date: 12-Aug-92

PROJECT: SAMPLE - AES 5.1

..... Participant	FISCAL YEAR 1991	1992	1993	1994	1995	Sub Total
11 MMES TITLE I & II ENGR.	.	1653	9606	6401	.	17660
13 MMES TITLE III ENGR.	.	311	1870	1852	46	4079
21 MMES PROCUREMENT	.	21	124	162	17	324
41 MMES FIELD MAINTENANCE	.	433	2606	2582	64	5685
48 MMES A-E SUPPORT	.	665	3998	3961	98	8722
49 MMES PROJECT SERVICES	.	2384	11768	8527	85	22764
51 FIXED PRICE CONSTRUCTION	.	226	1357	1344	33	2960
63 MK-F DIRECT HIRE	175	4911	23480	43776	23538	95880
66 MK-F INDIRECTS ON FP	.	60	235	259	25	579
67 MK-F DIRECTS ON FP	.	202	780	649	16	1647
SUB - TOTAL	175	10866	55824	69513	23922	160300
CONTINGENCY	37	1670	8612	12042	4999	27360
GRAND TOTAL	212	12536	64436	81555	28921	187660

FISCAL YEAR SUMMARY

$1 X $1

Date: 12-Aug-92

PROJECT: SAMPLE - AES 5.1

..... Participant	FISCAL YEAR 1996	Total
11 MMES TITLE I & II ENGR.	.	17660
13 MMES TITLE III ENGR.	.	4079
21 MMES PROCUREMENT	.	324
41 MMES FIELD MAINTENANCE	.	5685
48 MMES A-E SUPPORT	.	8722
49 MMES PROJECT SERVICES	.	22764
51 FIXED PRICE CONSTRUCTION	.	2960
63 MK-F DIRECT HIRE	507	96387
66 MK-F INDIRECTS ON FP	.	579
67 MK-F DIRECTS ON FP	.	1647
SUB - TOTAL	507	160807
CONTINGENCY	107	27467
GRAND TOTAL	614	188274

MARK-UP SUMMARY

Project Number: 1
SAMPLE - AES 5.1

Project ESO Number.....A-DDDDD-A1
Revision Number.....1
Last Update.....08/11/92

Sort Order
1. Participant

Approved by:

Project Estimator	Date
Estimating Manager	Date

AES Version 5.1
Base Fiscal Year/Quarter: 92/1
STANDARD VALUE: ORMAY92.val EXPIRES: 8/15/93
ESTIMATE FILE: R:\SAMPLE\SAMPLE.est 08/11/92
SCHEDULE FILE: SAMPLE
REPORT FILE : R:\SAMPLE\mark-up.out 08/12/92 09:01:00

SAMPLE - AES 5.1
MARK-UP SUMMARY

Discipline: Engineering
Participant: 11 MMES TITLE I & II ENGR.
B/M Title: MM-ES TITLE I & II ENGINEERING
Building: 3038
Contingency: 14.6 %

WBS: 1.2
Cost Code: 9999 ENGINEERING
B/M Attribute: X01 MM-ES TITLE I & II ENGINEERING
Trace Number: X.3.1

	Total Miscellaneous	Job Factor	Shop Support	Health Physics	Industrial Hygiene	MAA/PIDAS	Procurement Services	Total Special
Labor(%)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Material(%)	0.0			0.0	0.0	0.0	0.0	0.0

Discipline: Engineering
Participant: 13 MMES TITLE III ENGR.
B/M Title: MM-ES TITLE III ENGINEERING
Building: 3038
Contingency: 14.6 %

WBS: 1.2
Cost Code: 9999 ENGINEERING
B/M Attribute: X02 MM-ES TITLE III ENGINEERING
Trace Number: X.3.2

	Total Miscellaneous	Job Factor	Shop Support	Health Physics	Industrial Hygiene	MAA/PIDAS	Procurement Services	Total Special
Labor(%)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Material(%)	0.0			0.0	0.0	0.0	0.0	0.0

Discipline: Civil and Site
Participant: 21 MMES PROCUREMENT
B/M Title: DEMOLITION
Building: 3038
Contingency: 21.1 %

WBS: 1.1
Cost Code: 6000 SPECIAL FACILITIES
B/M Attribute: CA01 DEMOLITION
Trace Number: C.1.3

	Total Miscellaneous	Job Factor	Shop Support	Health Physics	Industrial Hygiene	MAA/PIDAS	Procurement Services	Total Special
Labor(%)	5.0	15.0	4.0	0.0	0.0	0.0		6.0
Material(%)	5.0			0.0	0.0	0.0	0.0	0.0

Discipline: Civil and Site
Participant: 41 MMES FIELD MAINTENANCE
B/M Title: WASTE DISPOSAL
Building: 3038
Contingency: 21.1 %

WBS: 1.1
Cost Code: 6000 SPECIAL FACILITIES
B/M Attribute: CA04 WASTE DISPOSAL
Trace Number: C.1.6

	Total Miscellaneous	Job Factor	Shop Support	Health Physics	Industrial Hygiene	MAA/PIDAS	Procurement Services	Total Special
Labor(%)	5.0	0.0	0.0	0.0	0.0	0.0		0.0
Material(%)	5.0			0.0	0.0	0.0	0.0	0.0

CONTINGENCY WORK SHEET LISTING

Project Number: 1
SAMPLE - AES 5.1

Project ESO Number.....A-DDDDD-A1

Approved by:

Project Estimator	Date
Estimating and Scheduling Department Head	Date

AES Version 5.1
STANDARD VALUE: ORMAY92.val EXPIRES: 8/15/93
ESTIMATE FILE: R:\SAMPLE\SAMPLE.est 08/11/92
CONTINGENCY FILE: R:\SAMPLE\SAMPLE.Cnt
REPORT FILE: R:\SAMPLE\contws.Out 08/12/92 09:01:48

Project Title: SAMPLE - AES 5.1

Level of Estimate: Title I

Midpoint of Contingency: 20%

WBS: 1.1

Participant: MMES

Project Element	% Contingency Midpoint		Completeness of Design		Degree of Complexity		Contingency %
LAND AND LAND RIGHTS	20%	X	_.__	X	_.__	=	__.__%
IMPROVEMENT TO LAND	20%	X	_.__	X	_.__	=	__.__%
NEW BUILDINGS AND ADDITIONS	20%	X	_.__	X	_.__	=	__.__%
BUILDING MODIFICATIONS	20%	X	_.__	X	_.__	=	__.__%
OTHER STRUCTURE	20%	X	_.__	X	_.__	=	__.__%
SPECIAL FACILITIES	20%	X	0.88	X	1.20	=	21.1%
UTILITIES	20%	X	_.__	X	_.__	=	__.__%
STANDARD EQUIPMENT	20%	X	_.__	X	_.__	=	__.__%
CONST MGMT/SUPPORT SERVICES	20%	X	_.__	X	_.__	=	__.__%
ENGINEERING	20%	X	_.__	X	_.__	=	__.__%

Project Title: SAMPLE - AES 5.1

Level of Estimate: Title I

Midpoint of Contingency: 20%

WBS: 1.2

Participant: MMES

Project Element	% Contingency Midpoint		Completeness of Design		Degree of Complexity		Contingency %
LAND AND LAND RIGHTS	20%	X	_.__	X	_.__	=	__.__%
IMPROVEMENT TO LAND	20%	X	_.__	X	_.__	=	__.__%
NEW BUILDINGS AND ADDITIONS	20%	X	_.__	X	_.__	=	__.__%
BUILDING MODIFICATIONS	20%	X	_.__	X	_.__	=	__.__%
OTHER STRUCTURE	20%	X	_.__	X	_.__	=	__.__%
SPECIAL FACILITIES	20%	X	_.__	X	_.__	=	__.__%
UTILITIES	20%	X	_.__	X	_.__	=	__.__%
STANDARD EQUIPMENT	20%	X	_.__	X	_.__	=	__.__%
CONST MGMT/SUPPORT SERVICES	20%	X	_.__	X	_.__	=	__.__%
ENGINEERING	20%	X	1.00	X	1.22	=	24.4%

CONTINGENCY SUMMARY

Project Number: 1
SAMPLE - AES 5.1

Project ESO Number.....A-DDDDD-A1

Approved by:

Project Estimator	Date
Estimating and Scheduling Department Head	Date

AES Version 5.1
STANDARD VALUE: ORMAY92.val EXPIRES: 8/15/93
ESTIMATE FILE: R:\SAMPLE\SAMPLE.est 08/11/92
CONTINGENCY FILE: R:\SAMPLE\SAMPLE.Cnt
REPORT FILE: R:\SAMPLE\contsum.Out 08/12/92 09:02:33

Contingency Summary

Project Title: SAMPLE - AES 5.1
WBS: 1.1 Level of Estimate: Title I Midpoint of Contingency: 20 %

Estimate Dollars

Project Element	MMES	FP	MK-F	Total
LAND AND LAND RIGHTS	..	..	..	
IMPROVEMENT TO LAND	..	..	..	
NEW BUILDINGS AND ADDITIONS	..	2959	..	2959
BUILDING MODIFICATIONS	..	..	..	
OTHER STRUCTURE	..	..	..	
SPECIAL FACILITIES	6009	..	37575	43584
UTILITIES	..	..	..	
STANDARD EQUIPMENT	..	..	..	
CONST MGMT/SUPPORT SERVICES	17407	..	2225	19632
ENGINEERING	..	..	..	
Total Estimate	23416	2959	39800	66175

Contingency Dollars

Project Element	MMES	FP	MK-F	Total
LAND AND LAND RIGHTS	..	..	..	
IMPROVEMENT TO LAND	..	..	..	
NEW BUILDINGS AND ADDITIONS	..	376	..	376
BUILDING MODIFICATIONS	..	..	..	
OTHER STRUCTURE	..	..	..	
SPECIAL FACILITIES	1268	..	7928	9196
UTILITIES	..	..	..	
STANDARD EQUIPMENT	..	..	..	
CONST MGMT/SUPPORT SERVICES	..	..	266	266
ENGINEERING	..	..	..	
Total Contingency	1268	376	8195	9838

The overall distributed Contingency is: 14.87%

APPENDIX E

ERROR MESSAGES AND CODES

This appendix describes certain error conditions that may occur during execution of the Automated Estimating System (AES). When an error occurs during the execution of the program, an error message will appear on the screen, and the program will return to the AES Main Menu. The message is displayed in the format:

ERROR....nnn
Error Message.....
at XXXX:YYYY

where nnn is the error number and XXXX:YYYY is the run-time error address (segment and offset) where the error occurred.

The following lists the more common error messages reported from AES.

DOS ERRORS

4 Too many open files.
Reported if the program has too many open files. DOS never allows more than 15 files open per process. If this error occurs, check the CONFIG.SYS file. It should include a FILES=xx entry, where xx should be set to at least 20.

5 File access denied.
Reported when a file has been selected for update and the file or directory is a read-only file.

I/O ERRORS

100 Disk read error.
Reported when an attempt is made to read past the end of the file. Usually occurs when reading a corrupted file due to damaged media or an improperly closed file.

101 Disk write error.
Reported when writing to a file and the disk becomes full.

CRITICAL ERRORS

150 Disk is write-protected.
Reported when an attempt is made to write to a disk that is write protected.

153 Drive not ready.
Reported when an attempt is made to read or write to the indicated drive. Possible causes for this error are that the drive door is not closed, the diskette is not properly formatted, or the drive is located on a network server that has been turned off or re-booted.

K/CSD/TM-64
Revision 4
Dist. Category UC-000

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