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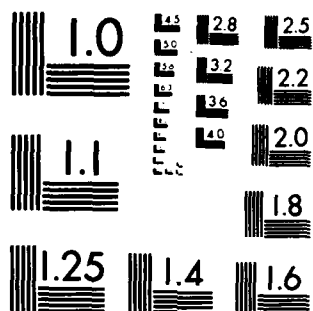
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THE SENTINEL BRIGHT COST MODELS PROGRAM

By
C. M. COLECCHI

JANUARY 1984

Prepared for
DEPUTY FOR TACTICAL SYSTEMS
ELECTRONIC SYSTEMS DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
Hanscom Air Force Base, Massachusetts



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19. ABSTRACT (Continue on reverse if necessary and identify by block number) Three cost models -- the OASIS, the TERCON, and the Air Force Model -- are presently being used to determine the total cost of various Department of Defense programs. In the past, these cost calculations were performed manually. This paper describes the SENTINAL BRIGHT Cost Models Program, a program written to automate the cost projection process.				
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SECTION 1

INTRODUCTION

1.1 GENERAL

In order to estimate budgets for various programs, three cost models--the OASIS model, the Air Force Model, and the TERCON Model--have been developed. The OASIS Model cost elements are based on past experience with the OASIS Program. An "ESD Cost Factor Study" performed by ESD/AC and published in March of 1978 provides the criteria upon which the Air Force Model is based. The TERCON Model was used by MITRE to prepare budget cost estimates for the Semiautomated Terminal Control Center for the COMBAT GRANDE II Program.

Each of these models requires a cost estimate for both the anticipated hardware configuration and the software. The estimates are subsequently multiplied by the appropriate cost model weights to derive total program cost. Previously, each application of a cost model was calculated by hand; "what if" scenarios, during which hardware configurations and software estimates are frequently modified to determine the relationship between total program cost and the hardware and software estimates chosen, resulted in tedious manual recalculations.

This paper describes the software written to automate the cost modeling process.

1.2 PROGRAM OVERVIEW

The SENTINEL BRIGHT Cost Models Program allows the user to create new lists of hardware and modify old ones. A hardware list contains information about the anticipated program hardware configuration, such as the number of central processing units, disc units, printers, and so on, along with respective prices. This information is then used to calculate the total hardware cost associated with the configuration. It is this total cost that is later used as the hardware estimate for a particular cost model run. Hardware lists may also be displayed on the console, sent to the printer for hard copy, or deleted from the directory.

Each of the three cost models allows the user to choose a software estimate from a set of user-defined estimates or select a

new one to serve as input to a particular model run. A listing of the user's file directory is also a Main Menu option.

1.3 PROGRAM DESIGN

The SENTINEL BRIGHT Cost Models Program, written in FORTRAN, is a completely menu-driven system. As such, it guides the user through the various portions of the program. Each submenu has an exit option that returns control to the menu one level above it. If so desired, the Main Menus are eventually displayed and the user may exit the Cost Models Program or step through it once again. Single-letter commands are all that are required to run program modules.

In general, modules rather than subroutines were used to accommodate the various program functions. This reduces parameter passing and minimizes the effort required to alter the program in the future.

1.4 FUTURE DEVELOPMENTS

The three cost models employ various hardware weights or factors which represent the system engineering, development, testing, and other cost elements associated with a hardware suite procurement. Each model makes use of different weights with emphasis placed on different cost elements. These weights may require modification in the future. As the source code is presently written, the programmer must access the appropriate cost model element file and change the weight(s), as well as change the total cost equation in the affected cost model module. The modules must then be recompiled.

It would be useful, then, to develop a utility program that would allow the user to alter the cost elements of any model and automatically recalculate the total cost equation accordingly. This would allow for the simple modification of a cost model without requiring subsequent recompilation.

1.5 DOCUMENT SUMMARY

This document provides the user with the information necessary to project program costs using the OASIS, Air Force, and TERCON Cost Models.

Section 2 addresses the capabilities of the SENTINEL BRIGHT Cost Models Program in detail. Section 3 deals with the utility program, SWFILE, which allows for the creation of a software estimate file. A User's Manual is contained in Appendix A and the cost elements of each of the three cost models are included in Appendix B. Appendix C contains the information required to execute the SWFILE utility program, and Appendix D consists of a program design chart. A listing of the source code is in Appendix E.

SECTION 2

THE SENTINEL BRIGHT COST MODELS PROGRAM

2.1 THE MAIN MODULE

The main module consists of a TSO programmable CLIST (command list) which displays the Main Menu and, depending upon the option exercised, loads the appropriate FORTRAN object module for execution. The CLIST also handles the creating of new files and the deletion and retrieval of old files, listing the user's file directory, and obtaining file hard copy.

2.1.1 The Main Menu

The Main Menu consists of the following:

**** MENU OF OPTIONS ****

C)REATE HARDWARE LIST
A)ALTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND

The user selects an option by typing the appropriate letter. When the requested action or set of actions is complete, the Main Menu of options is again displayed.

2.2 CREATING A HARDWARE LIST

A hardware list consists of the various pieces of hardware that make up a particular hardware configuration, the price of each piece of hardware, the total number of each unit needed, and the number of development and/or production units required.

When the user opts to create a new hardware list, the program prompts for a file name. The file is then created and the user is guided by further prompts to complete the hardware list. For instance, the user is asked to enter the hardware identification, the unit cost, the number of units needed, and so on. As the data is entered, a sequence number is automatically assigned to each record. After each piece of hardware is entered, all of the previously entered units are displayed on the console for viewing, and a running total of hardware costs is displayed. When the hardware list is complete, the user exits by pressing the 'carriage return' when prompted for the hardware identification. The file is saved automatically and the Main Menu is displayed.

2.3 ALTERING A HARDWARE LIST

In order to alter an existing hardware list, the user is asked to enter the name of the file to be modified. The contents of the file are then displayed on the console along with the following prompt:

WOULD YOU LIKE TO:

M)ODIFY A RECORD
D)ELETE A RECORD
A)DD A RECORD
I)NSERT A RECORD
E)XIT

If the modify option is chosen, the sequence number of the record to be altered is entered, the user makes the appropriate changes, and the above prompt is displayed once again. The user may delete, modify, or insert a record, add a number of records to the hardware list, or exit back to the Main Menu. All changes to a file are saved automatically (i.e., originals are lost) upon exiting the submenu.

2.4 REMOVING, DISPLAYING, OR PRINTING A HARDWARE LIST

When removing a hardware list from the file directory, the user merely specifies the name of the file to be deleted. Similarly, if the user wishes to display the contents of a file on the console or get a hard copy of a file, the appropriate option is selected and the correct file name is entered. The CLIST then issues the appropriate operating system command.

2.5 THE OASIS MODEL

To run the OASIS Model, the user is asked to specify the name of the file containing the hardware list to be used in the calculation. The OASIS cost model elements (see Appendix B) are then displayed on the console along with all of the "current" software estimates. "Current" software estimates consist of the following: estimates that have been entered into a software file through the use of a utility program (see Section 3), or software estimates that have been entered into the software file by the user during previous cost model runs.

The user may now select a "current" estimate to be used as the software value in the cost calculation, or enter a new one that is automatically saved on file and retrieved as a "current" estimate during the next cost model run.

After having defined both the hardware and software estimates, the user may opt to run the model, and the total cost for a particular project under the given hardware and software cost constraints is calculated and displayed on the console. The results of the calculation are written to an output file for future hard-copy and/or retrieval.

2.6 THE AIR FORCE AND TERCON MODELS

The Air Force and TERCON Models are set up in the same manner as the OASIS Model. Once the user chooses to run a model, the hardware file must be specified and a software estimate selected. The cost model elements of each model are displayed. Once again, the projected costs are displayed on the console and saved on file. The user may run a model several times with different input parameters or return to the Main Menu.

SECTION 3

THE SOFTWARE FILE UTILITY PROGRAM

A utility program called SWFILE allows the user to create a file in which to store various software estimates. Prompts for the software value, any comments, and date guide the user in creating the file that is saved automatically upon exiting the program. This file is subsequently read from disc and its contents displayed on the console during a cost model run. As explained in Sections 2.5 and 2.6, the user may then add software estimates to the file and/or select an existing estimate with which to run the model. Because this program will probably only be used initially to create the file, since any additions can be handled during a cost model run, the program was not incorporated into the main body of the SENTINEL BRIGHT Cost Models Program.

APPENDIX A

SENTINEL BRIGHT COST MODELS PROGRAM USER'S MANUAL

A.1 INTRODUCTION

This manual serves to demonstrate the operation of the SENTINEL BRIGHT Cost Models Program. The various responses to the program prompts in the following pages are merely examples used to illustrate program functions.

A.2 GETTING STARTED

A.2.1 Invoking the SENTINEL BRIGHT Cost Models Program

The SENTINEL BRIGHT Cost Models Program runs on an IBM 4341 under the TSO operating system. In order to invoke the program after logging on,

KEY: EXEC SBCOST

The program will respond with the Main Menu:

MENU OF OPTIONS

C)REATE HARDWARE LIST
A)LTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND

A.3 EXAMPLE 1: CREATING A HARDWARE LIST

If the CREATE option is to be exercised,

KEY: C

The system responds with:

ENTER NEW FILE NAME:

KEY: TEST.DATA (the extension .DATA must be specified)

In a few moments the system responds with the message:

TEST.DATA HAS BEEN CREATED
PLEASE ENTER THE FOLLOWING INFORMATION.
IF HARDWARE LIST IS COMPLETE,
PRESS 'RETURN' WHEN PROMPTED FOR 'IDENTIFICATION'.

ENTER HARDWARE IDENTIFICATION:

KEY: CPU

ENTER UNIT COST IN THOUSANDS:
?(1)

KEY: 250

ENTER TOTAL NUMBER OF UNITS NEEDED:
?

KEY: 3

ENTER NUMBER OF DEVELOPMENT UNITS:
?

KEY: 1

ENTER NUMBER OF PRODUCTION UNITS:
?

KEY: 2

NOTE:

- (1) When looking for a number, a question mark will appear after the written prompt. The user must wait until the ? appears before keying response.

After the number of production units is entered, the program calculates the cost of the hardware and displays it as follows:

IDENTIFICATION *****	UNIT COST *****	NO. ***	DEVELOPMENT *****	PRODUCTION *****	TOTAL COST *****
1 CPU	250.0	3	1	2	750.0
TOTALS			250.0K	500K	750.0K

The program continues to prompt for a second piece of hardware:

ENTER HARDWARE IDENTIFICATION:

KEY: TERMINALS

ENTER UNIT COST IN THOUSANDS
?

KEY: 15

ENTER TOTAL NUMBER OF UNITS NEEDED:
?

KEY: 100

ENTER NUMBER OF DEVELOPMENT UNITS:
?

KEY: 20

ENTER NUMBER OF PRODUCTION UNITS:
?

KEY: 80

IDENTIFICATION *****	UNIT COST *****	NO. ***	DEVELOPMENT *****	PRODUCTION *****	TOTAL COST *****
1 CPU	250.0	3	1	2	750.0
2 TERMINALS	15.0	100	20	80	1500.0
TOTALS			550.0K	1.7M	2.3M

ENTER HARDWARE IDENTIFICATION:

If at this point the hardware list is complete, press the 'RETURN' key. The program then displays the following message:

YOUR FILE HAS BEEN SAVED

The program now returns back to the Main Menu.

A.4 EXAMPLE 2: ALTERING A HARDWARE LIST

** MENU OF OPTIONS **

C)REATE HARDWARE LIST
A)LTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)OASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND

To alter an existing hardware list:

KEY: A

The program responds:

ENTER FILE NAME:

KEY: TEST.DATA

The contents of TEST.DATA are displayed on the console.

IDENTIFICATION *****	UNIT COST *****	NO. ***	DEVELOPMENT *****	PRODUCTION *****	TOTAL COST *****
1 CPU	250.0	3	1	2	750.0
2 TERMINALS	15.0	100	20	80	1500.0
TOTALS			550.0K	1.7M	2.3M

WOULD YOU LIKE TO:

M)ODIFY A RECORD
D)ELETE A RECORD
A)DD A RECORD
I)NSERT A RECORD
E)XIT

A.4.1 Adding a Record

The user now selects the type of modification to be completed. For example, to add a record:

KEY: A

The program responds with:

ONCE RECORD(S) ARE ADDED PRESS 'RETURN'
WHEN PROMPTED FOR 'IDENTIFICATION'

ENTER HARDWARE IDENTIFICATION:

KEY: PRINTERS

ENTER UNIT COST IN THOUSANDS:
?

KEY: 5

ENTER TOTAL NUMBER OF UNITS NEEDED:
?

KEY: 4

ENTER NUMBER OF DEVELOPMENT UNITS:
?

KEY: 0

ENTER NUMBER OF PRODUCTION UNITS:
?

KEY: 4

The contents of the file, along with new record(s) are displayed.

IDENTIFICATION *****	UNIT COST *****	NO. ***	DEVELOPMENT *****	PRODUCTION *****	TOTAL COST *****
1 CPU	250.0	3	1	2	750.0
2 TERMINALS	15.0	100	20	80	1500.0
3 PRINTERS	5.0	4	0	4	20.0
TOTALS			550.0K	1.7M	2.3M

The program continues prompting for additional records,

ENTER HARDWARE IDENTIFICATION:

A.4.2 Modifying a Record

At this point, the user may add additional records or press the 'RETURN' key. Assuming that the latter action is performed, the program returns to the prompt:

WOULD YOU LIKE TO:

M)ODIFY A RECORD
D)ELETE A RECORD
A)DD A RECORD
I)NSERT A RECORD
E)XIT

To modify a record:

KEY: M

The program responds:

WHICH RECORD WOULD YOU LIKE TO MODIFY?
?

KEY: 2

The record specified then appears on the console along with the following prompt:

IDENTIFICATION *****	UNIT COST *****	NO. ***	DEVELOPMENT *****	PRODUCTION *****	TOTAL COST *****
2 TERMINALS	15	100	20	80	1500.0

MODIFY I)DENTIFICATION, UNIT COST, N)O. OF UNITS,
D)EVELOPMENT, P)RODUCTION T)OTAL COST,
E)XIT?

To modify unit cost:

KEY: U

The program prompts:

ENTER UNIT COST IN THOUSANDS:
?

KEY: 20

The program responds:

RECORD NO. 2 NOW LOOKS LIKE THIS:

IDENTIFICATION *****	UNIT COST *****	NO. ***	DEVELOPMENT *****	PRODUCTION *****	TOTAL COST *****
2 TERMINALS	20.0	100	20	80	2000.0

The unit cost has been altered and the total cost recalculated. The contents of the entire file are then displayed on the console along with:

WOULD YOU LIKE TO:

M)ODIFY A RECORD
D)ELETE A RECORD
A)DD A RECORD
I)NSERT A RECORD
E)XIT

Before moving on to inserting and deleting a record, there is another point that should be made concerning modifying a record. As mentioned above, when the user wishes to modify a record, the program prompts for the section of the record to be altered--i.e., the hardware identification, unit cost, number of units, development and production units, or the total cost.

The user can alter the number of development and/or production units without modifying the total number of units manually. The program accepts development and production unit changes and automatically modifies the total number of units accordingly. When the user opts to alter the total number of units required, the program once again accepts the modification and then prompts the user:

REENTER D)EVELOPMENT, P)RODUCTION UNITS, B)OTH, OR N)EITHER?

in anticipation of any further action that might be necessary. For example, the user may have incorrectly entered the total number of

units required and not wish to modify any other entries. Or it may be necessary to reflect a change in the total number of units in terms of the development and/or production units. Hence, the program accommodates all of the possibilities. When all modifications are complete, the contents of the file are displayed on the console.

A.4.3 Inserting and Deleting a Record

IDENTIFICATION *****	UNIT COST *****	NO. ***	DEVELOPMENT *****	PRODUCTION *****	TOTAL COST *****
1 CPU	250.0	3	1	2	750.0
2 TERMINALS	20.0	100	20	80	2000.0
3 PRINTER	5.0	4	0	4	20.0
-----TOTALS			650.0K	2120.0K	2.8M

WOULD YOU LIKE TO:

M)ODIFY A RECORD
D)ELETE A RECORD
A)DD A RECORD
I)NSERT A RECORD
E)XIT

To delete a record,

KEY: D

The program responds with:

WHICH RECORD WOULD YOU LIKE TO DELETE?

KEY: 2

The contents of the altered file are displayed for the user.

IDENTIFICATION *****	UNIT COST *****	NO. ***	DEVELOPMENT *****	PRODUCTION *****	TOTAL COST *****
1 CPU	250.0	3	1	2	750.0
2 PRINTER	5.0	4	0	4	20.0
TOTALS			250.0K	520.0K	770.0K

WOULD YOU LIKE TO:

M)ODIFY A RECORD
D)ELETE A RECORD
A)DD A RECORD
I)NSERT A RECORD
E)XIT

In order to insert a record

KEY: I

The program asks:

AFTER WHICH RECORD WOULD YOU LIKE TO INSERT A RECORD?
?

KEY: 1

The program guides the user:

ENTER HARDWARE IDENTIFICATION:

KEY: MODEMS

ENTER TOTAL NUMBER OF UNITS NEEDED:
?

KEY: 20

ENTER NUMBER OF DEVELOPMENT UNITS:
?

KEY: 0

ENTER NUMBER OF PRODUCTION UNITS:
?

KEY: 20

After the number of production units is entered, the file is again displayed on the console.

IDENTIFICATION *****	UNIT COST *****	NO. ***	DEVELOPMENT *****	PRODUCTION *****	TOTAL COST *****
1 CPU	250.0	3	1	2	750.0
2 MODEMS	.2	20	0	20	4.0
3 PRINTER	5.0	4	0	4	20.0
TOTALS			250.0K	524.0K	774.0K

WOULD YOU LIKE TO:

M)ODIFY A RECORD
D)ELETE A RECORD
A)DD A RECORD
I)NSERT A RECORD
E)XIT

To return to the Main Menu:

KEY: E

A.5 EXAMPLE 3: DISPLAYING A HARDWARE LIST

MENU OF OPTIONS

C)REATE HARDWARE LIST
A)ALTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND

If the user wants to take a look at a hardware list before running a cost model to determine if, for instance, the hardware list must be altered, or if it is the correct file to use for a particular cost model run, the program allows the user to display the contents of a file on the console.

KEY: D

The program replies:

ENTER FILE NAME:

KEY: TEST.DATA

and the file is displayed.

IDENTIFICATION *****	UNIT COST *****	NO. ***	DEVELOPMENT *****	PRODUCTION *****	TOTAL COST *****
1 CPU	250.0	3	1	2	750.0
2 MODEMS	.2	20	0	20	4.0
3 PRINTER	5.0	4	0	4	20.0
TOTALS			250.0K	524.0K	774.0K

A.6 EXAMPLE 4: PRINTING A FILE

MENU OF OPTIONS

C)REATE HARDWARE LIST
A)ALTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND

In order to get a hard copy of a file--a hardware list, the software estimate file, or an output file which stores various cost modeling results,

KEY: P

and the program states:

ENTER FILE NAME:

KEY: TEST.DATA

After a few moments, the program responds:

PROCESSING ENDED AT EOD

PRINT ANOTHER FILE?

Y)ES
OR
N)O

The user enters the appropriate response. Once the file(s) have been sent to the printer for hard copy and the N)O option specified, the program returns to the Main Menu.

A.7 THE OASIS, TERCON, AND AIR FORCE COST MODELS

MENU OF OPTIONS

C)REATE HARDWARE LIST
A)ALTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND

Since the process by which a cost model is run is exactly the same for each model, the OASIS Cost Model will serve as the example for the three models.

To run the OASIS Model,

KEY: O

The program responds:

ENTER FILE NAME CONTAINING HARDWARE LIST:

KEY: TEST.DATA

ENTER SOFTWARE ESTIMATE FILE NAME:

KEY: SW.DATA(1)

NOTE:

- (1) The software estimate file name is the name of the file containing one or more of the software estimates to be used in the cost calculation. It is created using the utility program SW.FILE. See Appendix C.

The program then prompts for an output file, the file in which the results of the cost model are to be stored for future reference.

WOULD YOU LIKE TO:

C)REATE A NEW OUTPUT FILE
R)ETRIEVE AN OLD ONE

KEY: C

ENTER NEW OUTPUT FILE NAME:

KEY: OASIS.DATA

The OASIS Cost Model elements are now displayed on the console.

OASIS COST MODEL ELEMENTS

HARDWARE COST		HW
SUPPORT MATERIAL (SPARES, MANUALS, LICENCES, DIAGNOSTIC KITS, ETC.)	1.00	HW
SUBCONTRACT MAINTENANCE	.24	HW
LABOR (ENGINEERING)	.80	HW*
BURDEN	.80	HW*
OTHER DIRECT COSTS	.20	HW*
SUBTOTAL	4.04	HW
G & A @ 15% OF SUBTOTAL	.61	HW
FEE @ 12% OF SUBTOTAL	.48	HW
HARDWARE FACTORS	5.13	HW
SOFTWARE		SW

TOTAL COST 5.13 HW' + 2.85 HW + SW

WHERE HW' = COST OF PRIME SET OF HARDWARE
HW = COST OF REMAINING HARDWARE

*THESE FACTORS APPLY TO THE PRIME SET OF HARDWARE ONLY.

The software estimates contained in the software estimate file
specified earlier are also displayed.

****CURRENT SOFTWARE ESTIMATES DISPLAYED IN MILLIONS****

	VALUE	COMMENTS	DATE
1	3.40	JENSEN	3 MAR 83
2	4.20	CMC	3 MAR 83

WOULD YOU LIKE TO:

A)DD A NEW SOFTWARE ESTIMATE
C)HOOSE AN OLD ONE
R)UN COST MODEL
E)XIT

To add an estimate to the file,

KEY: A

The program subsequently prompts:

ENTER SOFTWARE ESTIMATE:
(INCLUDE DECIMAL POINT)

KEY: 5.7

ENTER COMMENTS:

KEY: JENSEN

ENTER DATE:

KEY: 30 MAR 83

****CURRENT SOFTWARE ESTIMATES DISPLAYED IN MILLIONS****

	VALUE	COMMENTS	DATE
1	3.40	JENSEN	3 MAR 83
2	4.20	CMC	3 MAR 83
3	5.70	JENSEN	30 MAR 83

All of the "current" software estimates are displayed along with:

WOULD YOU LIKE TO:

A)DD A NEW SOFTWARE ESTIMATE
C)HOOSE AN OLD ONE
R)UN COST MODEL
E)XIT

To select an "old" software estimate:

KEY: C

WHICH ESTIMATE?
?

KEY: 2

The program once again responds with the following prompt:

WOULD YOU LIKE TO:

A)DD A NEW SOFTWARE ESTIMATE
C)HOOSE AN OLD ONE
R)UN COST MODEL
E)XIT

This prompt is displayed in order to give the user the opportunity to exit at any time, for example, if the wrong estimate was inadvertently chosen.

To run the OASIS Model,

KEY: R

ENTER TODAY'S DATE:

KEY: 30 MAR 83

The results of the calculation are displayed on the console and written to the specified output file.

30 MAR 1983

CASE 1 *****

THE SOFTWARE ESTIMATE IS:	4.20M
THE HARDWARE DEVELOPMENT COSTS ARE:	6.4M
THE HARDWARE PRODUCTION COSTS ARE:	4.4M
**THE OASIS MODEL COST ESTIMATE IS:	49.6M

The software estimates are now displayed and the user has the option of running the Cost Model once again.

****CURRENT SOFTWARE ESTIMATES DISPLAYED IN MILLIONS****

	VALUE	COMMENTS	DATE
1	3.40	ME	3 MAR 83
2	4.20	ME	3 MAR 83
3	5.70	JENSEN	30 MAR 83

WOULD YOU LIKE TO:

A)DD A NEW SOFTWARE ESTIMATE
C)HOOSE AN OLD ONE
R)UN COST MODEL
E)XIT

To run the model with another software estimate,

KEY: C

WHICH ESTIMATE?
?

KEY: 1

WOULD YOU LIKE TO:

A)DD A NEW SOFTWARE ESTIMATE
C)HOOSE AN OLD ONE
R)UN COST MODEL
E)XIT

KEY: R

And the results are calculated and displayed.

CASE 2 *****

THE SOFTWARE ESTIMATE IS: 3.40M
THE HARDWARE DEVELOPMENT COSTS ARE: 6.4M
THE HARDWARE PRODUCTION COSTS ARE: 4.4M
**THE OASIS MODEL COST ESTIMATE IS: 48.8M

CURRENT SOFTWARE ESTIMATES DISPLAYED IN MILLIONS

	VALUE	COMMENTS	DATE
1	3.40	ME	3 MAR 83
2	4.20	ME	3 MAR 83
3	5.70	JENSEN	30 MAR 83

WOULD YOU LIKE TO:

A) DO A NEW SOFTWARE ESTIMATE
C) CHOOSE AN OLD ONE
R) RUN COST MODEL
E) EXIT

KEY: E (to exit)

A.8 REMOVING A HARDWARE LIST FROM THE FILE DIRECTORY

MENU OF OPTIONS

C)REATE HARDWARE LIST
A)ALTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND

To remove or delete a hardware list from the file directory,

KEY: R

The program then asks the user:

REMOVE WHICH FILE?

KEY: TEST.DATA

When the file has been deleted, the message,

TEST.DATA HAS BEEN DELETED

appears on the screen. The Main Menu is then displayed on the console.

A.9 LIST FILE DIRECTORY

MENU OF OPTIONS

C)REATE HARDWARE LIST
A)ALTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND

To obtain a listing of the file directory, simply

KEY: L

and the program will display on the console all the files contained in the user's directory and return to the Main Menu.

A.10 EXITING THE PROGRAM

To exit the SENTINEL BRIGHT Cost Models Program,

KEY: E

Shortly thereafter, the prompt

READY

will appear. This signifies that control has been returned to the TSO operating system, from which the user can execute another program, log off, and so on.

APPENDIX B

THE COST MODELS

B.1 THE OASIS COST MODEL

The following is a list of the OASIS Cost Model elements, upon which the hardware weights are derived.

OASIS COST MODEL ELEMENTS

HARDWARE COST		HW
SUPPORT MATERIAL (SPARES, MANUALS LICENCES, DIAGNOSTIC KITS, ETC.)	1.00	HW
SUBCONTRACT MAINTENANCE	.24	HW
LABOR (ENGINEERING)	.80	HW*
BURDEN	.80	HW*
OTHER DIRECT COSTS	.20	HW*
SUBTOTAL	4.04	HW
G & A @ 15% OF SUBTOTAL	.61	HW
FEE @ 12% OF SUBTOTAL	.48	HW
HARDWARE FACTORS	5.13	HW
SOFTWARE		SW
TOTAL COST	5.13	HW' + 2.85 HW + SW

WHERE HW' = COST OF PRIME SET OF HARDWARE
 HW = COST OF REMAINING HARDWARE

*THESE FACTORS APPLY TO THE PRIME SET OF HARDWARE ONLY.

B.2 THE AIR FORCE COST MODEL

The following includes the Air Force Cost Model elements.

AIR FORCE COST MODEL ELEMENTS

HARDWARE		HW
HARDWARE ENGINEERING	.25	HW
INTEGRATION & ASSEMBLY (.09-.14)*	.10	PME

SUBTOTAL PME (TOTAL OF ABOVE)	1.25 HW + .10 PME = 1.40 HW	
-------------------------------	-----------------------------	--

TEST & EVALUATION (.18-.25)	.25	PME
DATA (.16-.22)	.10	PME
PECULIAR SUPPORT EQUIPMENT (.01-.02)	.00	PME
SPARES (.19-.22)	.00	PME
OPERATIONAL SITE ACTIVATION (.03-.05)	.05	PME

SUBTOTAL SUPPORT COSTS	.40 PME	
------------------------	---------	--

SOFTWARE		SW
SYSTEM ENGINEERING	.23	(PME + SW) = .28 HW + .20

TOTAL COST	2.65 HW + 1.20 SW	
----------------	-------------------	--

*RANGE OF VALUES PRESENTED IN THE STUDY

B.3 THE TERCON COST MODEL

The TERCON Cost Model elements are as follows:

TERCON COST MODEL ELEMENTS

HARDWARE		
CABLES & INSTALLATION KITS	.05	HW HW
PME (TOTAL OF ABOVE)	1.05	HW SW
SOFTWARE		
FACILITIES	.01 PME	
DT&E	.30 PME + .20 SW	
SYSTEM ENGINEERING	.15 PME + .15 SW	
R/M/A	.01 PME	
PROGRAM MANAGEMENT	.15 PME + .15 SW	
CONFIGURATION MANAGEMENT	.01 PME + .01 SW	
PACKING	.01 PME	
TRANSPORTATION	.02 PME	
QUALITY ASSURANCE	.01 PME + .01 SW	
DATA	.15 PME + .05 SW	
SUPPORT EQUIPMENT	.03 PME	
ACQUISITION SPARES	.04 PME	
TOTAL SUPPORT COSTS	.89 PME + .57 SW	
TOTAL DIRECT COSTS	1.98 HW + 1.57 SW	
INDIRECT COSTS	.35 (1.98 HW + 1.57 SW)	
***TOTAL COST**	2.65 HW + 2.10 SW	

APPENDIX C
SOFTWARE ESTIMATES FILE UTILITY PROGRAM

SWFILE is a TSO programmable CLIST that creates a file in which to store the various software estimates used in the cost calculations.

To execute the utility program SWFILE,

KEY: EXEC SWFILE

The program prompts:

ENTER SOFTWARE ESTIMATE FILE NAME:

KEY: (e.g., SW.DATA)

ENTER SOFTWARE ESTIMATE IN MILLIONS:
(INCLUDE DECIMAL POINT)

KEY: 4.2

ENTER COMMENTS:

KEY: JENSEN

ENTER DATE:

KEY: 7 MAR 83

ENTER SOFTWARE ESTIMATE IN MILLIONS:
(INCLUDE DECIMAL POINT)

KEY: 3.8

ENTER COMMENTS:

KEY: CMC

ENTER DATE:

KEY: 10 MAR 83

The program again displays all of the estimates.

	VALUE	COMMENTS	DATE
1	4.2	JENSEN	7 MAR 83
2	3.8	CMC	10 MAR 83

ENTER SOFTWARE ESTIMATE IN MILLIONS:
(INCLUDE DECIMAL POINT)

When all estimates have been entered, press 'RETURN' to exit program when prompted for the next software estimate.

The program automatically saves the contents of the file under the name specified and informs the user,

YOUR FILE HAS BEEN SAVED

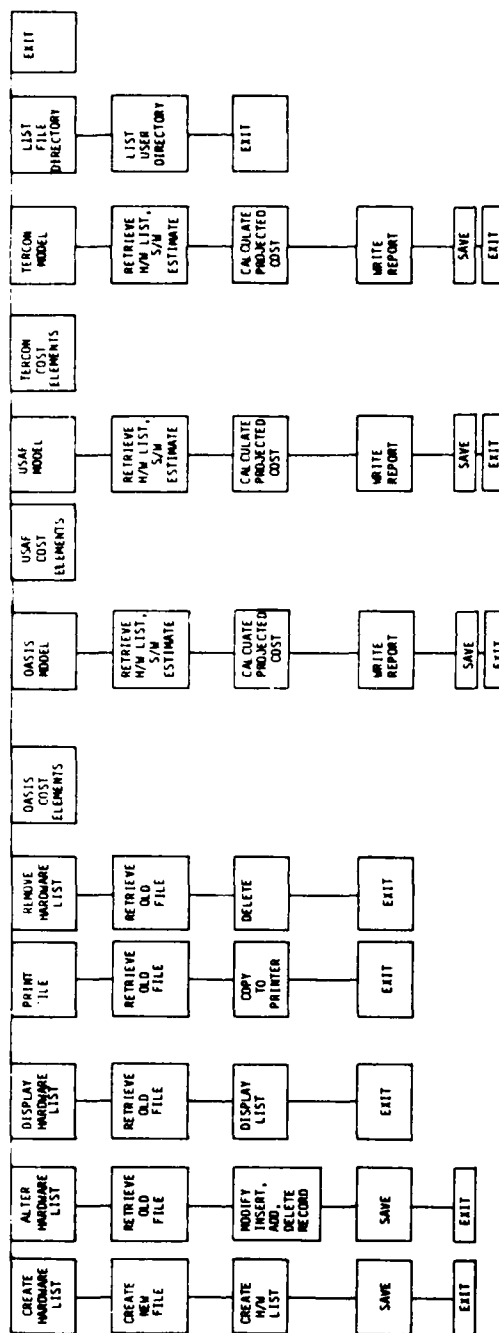
The "READY" prompt will appear and the system is waiting to accept any TSO operating system command.

APPENDIX D
PROGRAM DESIGN CHART

THE SENTINEL BRIGHT COST MODELS PROGRAM

MAIN MODULE

(MENU)



APPENDIX E
THE SOURCE CODE


```

FREEALL
GOTO MENU
END
IF BAMS = D THEN +
DO
WRITE ENTER FILENAME:
READ $FILE
ALLOC FI(FT08FOO1) DA($FILE) OLD
CLNSCRN
LOAD DISPL FORTLB
GOTO MENU
END
IF BAMS = P THEN +
DO
AGAIN: WRITE ENTER FILENAME:
READ $FILE
LISTOFF $FILE
WRITE PRINT ANOTHER FILE?
WRITE Y/YES OR N/NO
READ BANSR
IF BANSR = Y THEN GOTO AGAIN
GOTO MENU
END
IF BAMS = O THEN +
DO
CLNSCRN
WRITE ENTER FILENAME CONTAINING HARDWARE LIST:
READ $FILE
WRITE ENTER SOFTWARE ESTIMATE FILENAME:
READ $FILE2
WRITE WOULD YOU LIKE TO:
WRITE C/CREATE A NEW OUTPUT FILE
WRITE R/RETRIEVE AN OLD ONE.
READ BANS2
ALLOC FI(FT07FOO1) DA($FILE) OLD
ALLOC FI(FT08FOO1) DA($FILE2) OLD
ALLOC FI(FT09FOO1) DA(OTEXT DATA) OLD
IF BANS2 = C THEN +
DO
WRITE ENTER NEW OUTPUT FILENAME:
READ $FILE3
ATTRIB XYZ RECFM(F B) LRECL(80) BLKSIZE(3200)
ALLOC FI(FT10FOO1) DA($FILE3) USING(XYZ) NEW SPACE(5.2) TRACKS
GOTO OK
END
WRITE ENTER OUTPUT FILENAME:
READ $FILE2
ALLOC FI(FT10FOO1) DA($FILE3) OLD
OK: LOAD DISPL FORTLB
GOTO MENU
END
IF BAMS = U THEN +
DO
CLNSCRN
WRITE ENTER FILENAME CONTAINING HARDWARE LIST:
READ $FILE
WRITE ENTER SOFTWARE ESTIMATE FILENAME:
READ $FILE2

```

```

WRITE WOULD YOU LIKE TO:
WRITE C)CREATE A NEW OUTPUT FILE
WRITE R)RETRIEVE AN OLD ONE
READ BANS2
ALLOC FI(FT07FOO1) DA(8FILE) OLD
ALLOC FI(FT08FOO1) DA(8FILE2) OLD
ALLOC FI(FT09FOO1) DA(8TEXT DATA) OLD
IF BANS2 = C THEN +
DO
  WRITE ENTER NEW OUTPUT FILENAME:
  READ 8FILE3
  ATTRIB XYZ RECFM(F B) LRECL(80) BLKSIZE(3200)
  ALLOC FI(FT10FOO1) DA(8FILE3) USING(XYZ) NEW SPACE(5,2) TRACKS
  GOTO OKAY
END
WRITE ENTER OUTPUT FILENAME:
READ 8FILE3
ALLOC FI(FT10FOO1) DA(8FILE3) OLD
OKAY: LOAD USAF FORTLIB
GOTO MENU
END
IF BANS = T THEN +
DO
  CURSORN
  WRITE ENTER FILENAME CONTAINING HARDWARE LIST
  READ 8FILE
  WRITE ENTER SOFTWARE ESTIMATE FILENAME:
  READ 8FILE2
  WRITE WOULD YOU LIKE TO:
  WRITE C)CREATE A NEW OUTPUT FILE
  WRITE R)RETRIEVE AN OLD ONE
  READ BANS2
  ALLOC FI(FT07FOO1) DA(8FILE) OLD
  ALLOC FI(FT08FOO1) DA(8FILE2) OLD
  ALLOC FI(FT09FOO1) DA(8TEXT DATA) OLD
  IF BANS2 = C THEN +
  DO
    WRITE ENTER NEW OUTPUT FILENAME:
    READ 8FILE3
    ATTRIB XYZ RECFM(F B) LRECL(80) BLKSIZE(3200)
    ALLOC FI(FT10FOO1) DA(8FILE3) USING(XYZ) NEW SPACE(5,2) TRACKS
    GOTO OK2
  END
  WRITE ENTER OUTPUT FILENAME:
  READ 8FILE3
  ALLOC FI(FT10FOO1) DA(8FILE3) OLD
  OK2: LOAD TERCOM FORTLIB
  GOTO MENU
  END
IF BANS = L THEN +
DO
  LISTC
  GOTO MENU
END
IF BANS = E THEN END

```



```

C-----
C      THE SENTINEL BRIGHT COST MODELS PROGRAM
C      CATHERINE M. COLECCI
C      MARCH 1981
C-----
C
C      MODULE : CREATE
C      FUNCTION : CREATES NEW HARDWARE LIST
C      INPUTS :  FILENAME
C      HARDWARE LIST ENTRIES
C      OUTPUTS :  ---
C      DESCRIPTION :  THE MODULE CREATES A NEW FILE IN
C                     WHICH TO STORE HARDWARE LIST , PROMPTING
C                     USER FOR FILENAME , PROGRAM THEN
C                     GUIDES USER IN CREATING HARDWARE
C                     LIST . FILE IS SAVED AUTOMATICALLY . MAIN MENUS
C                     ARE AGAIN DISPLAYED
C
C      DIMENSION COUNT(80),ID(50,6),UCOST(50),NUM(50),DEV(50),
C      1 PRO(50),TCOST(50)
C      INTEGER*4 ID,NUM,DEV,PRO,BLANK,THOU,MILL,DENOM,DENOM2
C      INTEGER SUM,COUNT
C      REAL*4 UCOST,TCOST,AMOUNT,TEMP,TCOST,TCOST,TEMP2,TEMP3
C      DATA BLANK//-.0N//,1//.0F//,0//,THOU//K//,MILL//M//
C
C      WRITE(5,21)
C
C      21 FORMAT(1, PLEASE ENTER THE FOLLOWING INFORMATION ://
C      1 , IF HARDWARE LIST IS COMPLETE ://
C      2 , PRESS *RETURN* WHEN PROMPTED FOR *IDENTIFICATION* )
C
C      AMOUNT=0.0
C      DENOM=THOU
C      DENOM2=THOU
C      DENOM3=THOU
C
C      DO 141 I=1,50
C      SUM=SUM+1
C      COUNT(1)=SUM
C      WRITE(5,31)
C      31 FORMAT(1, ENTER HARDWARE IDENTIFICATION ://)
C      READ(5,41)(ID(1,J),J=1,6)
C      41 IF(ID(1,1).EQ.BLANK)GO TO 500
C      WRITE(5,51)
C      51 FORMAT(1, ENTER UNIT COST IN THOUSANDS ://)
C      READ(5,61)UCOST(1)
C      61 FORMAT(1, ENTER TOTAL NUMBER OF UNITS NEEDED ://)
C      READ(5,71)NUM(1)
C      71 FORMAT(1, ENTER NUMBER OF DEVELOPMENT UNITS ://)
C      READ(5,81)
C      81 FORMAT(1, ENTER NUMBER OF PRODUCTION UNITS ://)
C      TCOST(1)=(UCOST(1)*NUM(1))
C      TEMP2=TEMP2+(UCOST(1)*DEV(1))
C      TEMP3=TEMP3+(UCOST(1)*PRO(1))
C      TEMP=TEMP+TCOST(1)
C      AMOUNT=TEMP
C
C-----

```

```

00000545
00000547
00000550
00000550
00000560
00000565
00000566
00000567
00000568
00000570
00000580
00000590
00000600
00000610
00000620
00000630
00000640
00000650
00000660
00000670
00000680
00000690
00000700
00000710
00000720
00000730
00000740
00000750
00000760
00000770
00000780
00000790
00000800
00000810
00000820
00000830
00000840
00000850
00000855
00000856
00000857
00000858
00000870
00000880
00000890
00000900
00000910
00000920
00000925
00000926
00000927
00000930
00000940
00000950
00000960
00000970
00000980
00000990
00010000

TDCOST=TEMP2
TPCOST=TEMP3
IF(TEMP .GE. 1000)AMOUNT=TEMP/1000
IF(TEMP .GE. 1000)DENOM=MILL
IF(TEMP2 .GE. 1000)TDCOST=TEMP2/1000
IF(TEMP2 .GE. 1000)DENOM2=MILL
IF(TEMP3 .GE. 1000)TPCOST=TEMP3/1000
IF(TEMP3 .GE. 1000)DENOM3=MILL
WRITE(5,91)
91 FORMAT(T5,'IDENTIFICATION',T22,'UNIT COST',T34,'NO',
1 T40,'DEVELOPMENT',T54,'PRODUCTION',T67,
2 'TOTAL COST')
97 WRITE(5,97)
97 FORMAT(T5,'.....',T22,'.....',T34,'.....',
1 T40,'.....',T54,'.....',T67,
2 '.....')
DO 111 K=1,SUM
1 WRITE(5,101)COUNT(K),(ID(K,J),J=1,6),UCOST(K),NUM(K),DEV(K),
1 PRO(K),TCOST(K)
101 FORMAT(T11,T6,6A4,T23,F6,1,T33,14,T41,14,T55,14,T68,
1 F10.1)
111 CONTINUE
121 WRITE(5,121)
121 FORMAT(T4,'')
131 WRITE(5,131)TDCOST,DEFIN2,TPCOST,DEFIN3,AMOUNT,DENOM
131 FORMAT(T8,'TOTALS',T40,F8,1,A2,T54,F8,1,A2,T67,F8,1,A2)
141 CONTINUE
C /* END PROMPT */
C /* SAVE CHANGES TO FILE */
500 SUM=SUM+1
WRITE(8,151)SUM
151 FORMAT(T12)
WRITE(8,161)
161 FORMAT(T9,'IDENTIFICATION',T22,'UNIT COST',T34,'NO',
1 T40,'DEVELOPMENT',T54,'PRODUCTION',T68,
2 'TOTAL COST')
167 WRITE(8,167)
167 FORMAT(T5,'.....',T22,'.....',T34,'.....',
1 T40,'.....',T54,'.....',T68,
2 '.....')
DO 181 I=1,SUM
1 WRITE(8,171)COUNT(I),(ID(I,J),J=1,6),UCOST(I),NUM(I),DEV(I),
1 PRO(I),TCOST(I)
171 FORMAT(T11,T6,6A4,T23,F6,1,T33,14,T41,14,T55,14,T68,
1 F10.1)
181 CONTINUE
191 WRITE(8,191)
191 FORMAT(T4,'')
191
1 WRITE(8,201)TDCOST,DEFIN2,TPCOST,DEFIN3,AMOUNT,DENOM
201 FORMAT(T8,'TOTALS',T40,F8,1,A2,T54,F8,1,A2,T67,F8,1,A2)
C
211 WRITE(5,211)
C 211 FORMAT(' YOUR FILE HAS BEEN SAVED ')
STOP
END

```

```

C-----
C      THE SENTINEL BRIGHT COST MODEL'S PROGRAM
C      CATHERINE M. COLECCI
C      MARCH 1983
C-----
C      MODULE : ALTER
C      FUNCTION : ALTERS HARDWARE LIST
C      INPUTS : RECORD NO., MODIFICATIONS OR ADDITIONS TO FILE
C      OUTPUTS :
C      DESCRIPTION : ALLOWS USER TO MODIFY, DELETE, OR INSERT A RECORD,
C                   OR ADD A RECORD TO THE END OF A FILE
C-----
C      DIMENSION COUNT(80),ID(50,6),UCOST(50),NUM(50),
C                   DEV(50),PRO(50),TCOST(50),TITLE(1,20),STAR(1,20),
C                   LINE(1,19)
C      REAL*4 UCOST,TCOST,TPCOST,AMOUNT,STORE,STORE2,STORE3
C      INTEGER*4 ID,NUM,DEV,PRO,TITLE,STAR,LINE,VAL
C      INTEGER SUM,COUNT,BECOND,ANS,REPLY,A,D,E,U,P,DELREC,BLANK,PRIOR,
C      TEMP,NOREC,ONE,FLAG,NON,ON,OFF,ADD,PUTREC,DENOM,DENOM2,
C      DENOM3,THOU,MILL,NEW,BEFORE,CHANGE
C      DATA A/'A','D','E','I','J','L','N','O','P','R','S','T','U','V','W','X','Y','Z',
C      'BLANK',/
C      /O ONE/'1',/ON/'1',/OFF/'0',/THOU/'K',/MILL/'M',/
C
C      /* READ FILE, DISPLAY ON CONSOLE */
C
C      READ(8,1)SUM
C      1 FORMAT(12)
C      READ(8,5)(TITLE(I,J),J=1,20)
C      5 FORMAT(20A4)
C      WRITE(5,5)(TITLE(I,J),J=1,20)
C      READ(8,5)(STAR(I,J),J=1,20)
C      WRITE(5,5)(STAR(I,J),J=1,20)
C      DO 20 K=1,SUM
C      20 K=1,SUM
C      READ(8,10)COUNT(K),ID(K,J),J=1,6),UCOST(K),
C      NUM(K),DEV(K),PRO(K),TCOST(K)
C      10 FORMAT(T1,12,16,8A4,123,16,1,133,14,141,14,155,14,
C      T88,F10,1)
C
C      WRITE(5,10)COUNT(K),ID(K,J),J=1,6),UCOST(K),
C      NUM(K),DEV(K),PRO(K),TCOST(K)
C      10 CONTINUE
C      READ(8,22)(LINE(I,J),J=1,19)
C      22 FORMAT(19A4)
C      WRITE(5,22)(LINE(I,J),J=1,19)
C      READ(8,23)TCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM
C      23 FORMAT(T40,F8,1,A2,T54,F8,1,A2,T67,F8,1,A2)
C      WRITE(5,24)TCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM
C      24 FORMAT(T8,'TOTALS',T40,F8,1,A2,T54,F8,1,A2,T67,F8,1,A2)
C      /* END READ, DISPLAY */
C      GO TO 1200
C
C
C      1000 WRITE(5,25)(TITLE(I,J),J=1,20)
C      25 FORMAT(20A4)
C      WRITE(5,26)(STAR(I,J),J=1,20)
C      26 FORMAT(20A4)
C      DO 28 K=1,SUM
C      28 K=1,SUM
C      WRITE(5,27)COUNT(K),ID(K,J),J=1,6),UCOST(K),
C      NUM(K),DEV(K),PRO(K),TCOST(K)
C      27 FORMAT(T1,12,16,8A4,123,16,1,133,14,141,14,155,14,

```

47

```

2000 WRITE(5,140)
140 FORMAT(/, 'ENTER HARDWARE IDENTIFICATION ')
READ(5,150)(10(K,J),J=1,6)
150 FORMAT(8A4)
GO TO 6000

C
3000 WRITE(5,160)
160 FORMAT(/, 'ENTER UNIT COST IN THOUSANDS ')
READ(5,*)UCOST(K)
GO TO 6000

C
4000 WRITE(5,180)
180 FORMAT(/, 'ENTER TOTAL NUMBER OF UNITS NEEDED ')
READ(5,*)NUM(K)
WRITE(5,181)
181 FORMAT(/, 'REENTER DEVELOPMENT, PRODUCTION UNITS, ',
1 READ(5,182)CHANGE
182 FORMAT(A2)
WRITE(5,186)CHANGE
186 FORMAT('CHANGE=',A2)
IF(CHANGE.EQ. B)GO TO 4100
IF(CHANGE.EQ. D)GO TO 4200
IF(CHANGE.EQ. P)GO TO 4300
GO TO 6000

C
4100 MDU=ON
4200 WRITE(5,183)
183 FORMAT(/, 'REENTER NUMBER OF DEVELOPMENT UNITS ')
READ(5,*)DEV(K)
IF(MDU.EQ. ON)GO TO 4300
GO TO 6000

C
4300 WRITE(5,184)
184 FORMAT(/, 'REENTER NUMBER OF PRODUCTION UNITS ')
READ(5,*)PRO(K)
GO TO 6000

C
5000 WRITE(5,200)
200 FORMAT(/, 'ENTER NUMBER OF DEVELOPMENT UNITS ')
BEFORE=DEV(K)
READ(5,*)DEV(K)
VAL=DEV(K)+PRO(K)
IF(VAL.EQ. NUM(K))GO TO 5200
NEW=(DEV(K)-BEFORE)
NUM(K)=NUM(K)+NEW
5200 GO TO 6000

C
5500 WRITE(5,210)
210 FORMAT(/, 'ENTER NUMBER OF PRODUCTION UNITS ')
BEFORE=PRO(K)
READ(5,*)PRO(K)
VAL=PRO(K)+DEV(K)
IF(VAL.EQ. NUM(K))GO TO 6000
NEW=(PRO(K)-BEFORE)
NUM(K)=NUM(K)+NEW

C
6000 MDU=OFF
TCOST(K)=(UCOST(K)*NUM(K))
C
6100 WRITE(5,220)RECNO

```

```

00001180
00001190
00001200
00001210
00001220
00001230
00001240
00001250
00001260
00001270
00001280
00001290
00001300
00001310
00001320
00001330
00001340
00001350
00001360
00001367
00001370
00001380
00001390
00001400
00001410
00001412
00001420
00001430
00001440
00001445
00001450
00001460
00001462
00001463
00001464
00001465
00001467
00001470
00001480
00001480
00001500
00001505
00001507
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00001630
00001640

```

```

220 FORMAT(' RECORD NO ', I2, ' NOW LOOKS LIKE THIS ')
WRITE(5,221)(TITLE(I,J),J=1,20)
WRITE(5,221)(STAR(I,J),J=1,20)
221 FORMAT(20A4)
WRITE(5,230)COUNT(K), (ID(K,J),J=1,6), UCOST(K),
1 NUM(K), DEV(K), PRO(K), TCOST(K)
C
C      /* END MODIFY */
C
C      /* SAVE CHANGES TO FILE */
6500 REWIND 8
STORE=0.0
STORE2=0.0
STORE3=0.0
DENOM=THOU
DENOM2=THOU
DENOM3=THOU
IF(FLAG.EQ.0N)SUM=SUM+1
WRITE(6,222)SUM
222 FORMAT(I2)
WRITE(6,225)(TITLE(I,J),J=1,20)
WRITE(6,225)(STAR(I,J),J=1,20)
225 FORMAT(20A4)
DO 240 K=1,SUM
STORE=STORE+TCOST(K)
STORE2=STORE2+(UCOST(K)*DEV(K))
STORE3=STORE3+(PRO(K)*TCOST(K))
AMOUNT=STORE
TCOST=STORE2
TPCOST=STORE3
IF(STORE.GE.1000)AMOUNT=STORE/1000
IF(STORE2.GE.1000)DENOM=MILL
IF(STORE2.GE.1000)TPCOST=STORE2/1000
IF(STORE2.GE.1000)DENOM2=MILL
IF(STORE3.GE.1000)TPCOST=STORE3/1000
IF(STORE3.GE.1000)DENOM3=MILL
WRITE(8,230)COUNT(K), (ID(K,J),J=1,6), UCOST(K),
1 NUM(K), DEV(K), PRO(K), TCOST(K)
230 FORMAT(T1,I2,T6,I23,F6,I133,I4,I14,I155,I4,
1 T68,F10,I1)
240 CONTINUE
WRITE(8,225)(LINE(I,J),J=1,19)
WRITE(8,245)TCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM
245 FORMAT(I9,'TOTALS',T40,F8,I,A2,I54,F8,I,A2,T67,F8,I,A2)
C      /* END SAVE */
C      IF(ADD.EQ.0N)GO TO 1200
C      GO TO 1000
C
C      /* ADD RECORD TO FILE */
7000 WRITE(5,250)
250 FORMAT(' ONCE RECORD(S) ARE ADDED PRESS "RETURN" ',/
1 ' WHEN PROMPTED FOR "IDENTIFICATION" ')
C
C      ADD=ON
C      FLAG=ON
C      MOREC=SUM+1
C      DO 390 K=MOREC,50
C      SUM=SUM+1
C      COUNT(K)=SUM
C      WRITE(5,260)

```

```

260 FORMAT(' ENTER HARDWARE IDENTIFICATION ')
270 READ(S,270)(ID(K),J),J=1,6)
    FORMAT(6A4)
    IF(ID(K,1) EQ BLANK) GO TO 6500
    WRITE(S,280)
280 FORMAT(' ENTER UNIT COST IN THOUSANDS ')
    READ(S,*)UCOST(K)
    WRITE(S,300)
300 FORMAT(' ENTER TOTAL NUMBER OF UNITS NEEDED ')
    READ(S,*)NUM(K)
    WRITE(S,320)
320 FORMAT(' ENTER NUMBER OF DEVELOPMENT UNITS ')
    READ(S,*)DEV(K)
    WRITE(S,330)
330 FORMAT(' ENTER NUMBER OF PRODUCTION UNITS ')
    READ(S,*)PROD(K)
    TCOST(K)=(UCOST(K)*NUM(K))

C
C
C    /* DISPLAY CHANGES ON TERMINAL */
    STORE=0.0
    STORE2=0.0
    STORE3=0.0
    WRITE(S,360)(TITLE(I),J),J=1,20)
    WRITE(S,360)(STAR(I),J),J=1,20)
    FORMAT(20A4)
360 DO 380 L=1,SUM
        WRITE(S,370)COUNT(L),(ID(L,J),J=1,6),UCOST(L),
        & NUM(L),DEV(L),PROD(L),TCOST(L),
        & 168,F10.1)
        STORE=STORE+TCOST(L)
        STORE2=STORE2+UCOST(L)*DEV(L)
        STORE3=STORE3+UCOST(L)*PROD(L)
        AMOUNT=STORE
        TCOST=STORE2
        TPCOST=STORE3
        IF(STORE GE. 1000)AMOUNT=STORE/1000
        IF(STORE2 GE. 1000)DENOM=MILL
        IF(STORE3 GE. 1000)TCOST=STORE2/1000
        IF(STORE2 GE. 1000)DENOM2=MILL
        IF(STORE3 GE. 1000)TPCOST=STORE3/1000
        IF(STORE3 GE. 1000)DENOM3=MILL
        CONTINUE
380 WRITE(S,385)(LINE(I),J),J=1,19)
    FORMAT(19A4)
385 WRITE(S,387)TCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM
387 FORMAT('6. TOTAL',F10.1,F4.1,F2.1,F4.1,F8.1,F2.1,F8.1,F2.1)
390 CONTINUE

C
C
C    /* END ADD RECORD */
    /* DISPLAY ALTER MENUS */
    GO TO 1000

C
C
C    /* DELETE A RECORD FROM FILE */
8000 FLAG=OFF
    WRITE(S,410)
410 FORMAT(' WHICH RECORD WOULD YOU LIKE TO DELETE? ')
    READ(N,*)INDEL

```

```

LAST=SUM
SUM=SUM-1
IF(DELREC .EQ. ONE) GO TO 8500
IF(DELREC .EQ. LAST) GO TO 8500
**CHANGE ALL RECORDS AFTER DELETED**
DO 500 K=DELREC,SUM
  TEMP=K+1
  COUNT(K)=K
  DO 480 J=1,6
    ID(K,J)=ID(TEMP,J)
  480 CONTINUE
  UCOST(K)=UCOST(TEMP)
  NUM(K)=NUM(TEMP)
  DEV(K)=DEV(TEMP)
  PRO(K)=PRO(TEMP)
  TCOST(K)=TCOST(TEMP)
C
C 500 CONTINUE /* SAVE CHANGES TO FILE */
C
C GO TO 8500 /* DO IF 1ST RECORD IS DELETED */
C
8500 DO 540 K=1,SUM
  TEMP=K+1
  COUNT(K)=K
  DO 510 J=1,6
    ID(K,J)=ID(TEMP,J)
  510 CONTINUE
  UCOST(K)=UCOST(TEMP)
  NUM(K)=NUM(TEMP)
  DEV(K)=DEV(TEMP)
  PRO(K)=PRO(TEMP)
  TCOST(K)=TCOST(TEMP)
C
C 540 CONTINUE /* SAVE CHANGES TO FILE */
C
C GO TO 6500
C
C /* INSERT A RECORD */
C
9000 WRITE(5,550)
550 FORMAT(' AFTER WHICH RECORD WOULD YOU LIKE TO INSERT A RECORD? ')
READ(5,*)INREC
/* INITIALIZE DO VARIABLE SUBSCRIPTS */
NREC=INREC+1
NATREC=SUM
PUTREC=SUM+1
/* SHIFT ARRAY ELEMENTS TO ACCOMMODATE INSERT */
C
DO 600 K=NREC,SUM
  COUNT(K)=K
  DO 570 J=1,6
    ID(PUTREC,J)=ID(NATREC,J)
  570 CONTINUE
  UCOST(PUTREC)=UCOST(NATREC)
  NUM(PUTREC)=NUM(NATREC)
  DEV(PUTREC)=DEV(NATREC)
  PRO(PUTREC)=PRO(NATREC)
  TCOST(PUTREC)=TCOST(NATREC)
C
  PUTREC=PUTREC+1
  NATREC=NATREC+1
600 CONTINUE

```

```

00002870
00002880
00002890
00002900
00002910
00002920
00002930
00002940
00002950
00002960
00002970
00002980
00002990
00003000
00003010
00003020
00003030
00003040
00003050
00003060
00003070
00003080
00003090
00003100
00003110
00003120
00003130
00003140
00003150
00003160
00003170
00003180
00003190
00003200
00003210
00003220
00003230
00003240
00003250
00003260
00003270
00003280
00003290
00003300
00003310
00003320
00003330
00003340
00003350
00003360
00003370
00003380
00003390
00003400
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00003430
00003440
00003450
00003460

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```

C      WRITE(5,610)
610 FORMAT(' ENTER HARDWARE IDENTIFICATION ')
      READ(5,620)((ID(NREC,J),J=1,6)
620 FORMAT(6A4)
C
      WRITE(5,630)
630 FORMAT(' ENTER UNIT COST IN THOUSANDS ')
      READ(5,*) UCOST(NREC)
C
      WRITE(5,650)
650 FORMAT(' ENTER TOTAL NUMBER OF UNITS NEEDED ')
      READ(5,*) NUM(NREC)
C
      WRITE(5,670)
670 FORMAT(' ENTER NUMBER OF DEVELOPMENT UNITS ')
      READ(5,*) DEV(NREC)
C
      WRITE(5,690)
690 FORMAT(' ENTER NUMBER OF PRODUCTION UNITS ')
      READ(5,*) PROD(NREC)
      TCOST(NREC)=(UCOST(NREC)+NUM(NREC))
C
C      SUM=SUM+1
      COUNT(SUM)=SUM
C      GO TO 6500
C      9500 STOP
      END

```

```

00003480
00003490
00003500
00003510
00003520
00003530
00003540
00003550
00003560
00003570
00003580
00003590
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00003610
00003620
00003630
00003640
00003650
00003660
00003670
00003680
00003690
00003700
00003710
00003720
00003730
00003740
00003750
00003760
00003770
00003780

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```

C      THE SENTINEL BRIGHT COST MODELS PROGRAM
C      CATHERINE M. COLECCI
C      MARCH 1983
C
C      MODULE OASIS
C      FUNCTION : RUNS OASIS COST MODEL FOR SPECIFIC HARDWARE
C      : CONFIGURATION AND SOFTWARE ESTIMATE
C      : TOTAL HARDWARE DEVELOPMENT AND PRODUCTION COSTS.
C      : SOFTWARE ESTIMATES
C      : COST CALCULATION RESULTS TO SPECIFIED
C      : OUTPUT FILE
C
C      DIMENSION TITLE(1,23),NO(25),STEP(25,23),DATE(1,5)
C      COMMON FLAG,EST,DEVCS,PROCS,DENM2,DENM3
C      INTEGER NO,STEP,SUM,DENM2,DENM3,THOU,MILL,FLAG,ON,OFF,CASE
C      DATE
C      REAL*4 DEVCS,PROCS,EST,DCOST
C      DATA THOU/M/./MILL/M/./ON/O/./OFF/O/./
C      FLAG=OFF
C      CASE=0
C
C      /* GET OASIS MODEL */
C      READ(9,10)SUM
C      10 FORMAT(I2)
C      READ(9,20)((TITLE(I,J),J=1,23)
C      20 FORMAT(23A3)
C      WRITE(5,20)((TITLE(I,J),J=1,23)
C      DO 40 I=1,SUM
C      READ(9,30)((STEP(I,J),J=1,23)
C      30 FORMAT(23A3)
C      WRITE(5,30)((STEP(I,J),J=1,23)
C      40 CONTINUE /* GET SOFTWARE ESTIMATE */
C      1000 CALL SWEST
C      CASE=CASE+1
C      IF(FLAG.EQ.ON)GO TO 2000
C      IF(CASE.GT.1)GO TO 1200
C      WRITE(5,45)
C      45 FORMAT(/'ENTER TODAY'S DATE ')
C      READ(5,47)(DATE(I,J),J=1,5)
C      47 FORMAT(5A4)
C      WRITE(5,48)(DATE(I,J),J=1,5),CASE
C      WRITE(10,48)(DATE(I,J),J=1,5),CASE
C      48 FORMAT(/T30,5A4,/,/T3,'CASE',I3,/,
C      1,/,
C      GO TO 1250
C      1200 WRITE(10,49)CASE
C      WRITE(5,49)CASE
C      49 FORMAT(/T3,'CASE',I3,/,
C      1,/,
C      1250 WRITE(5,50)EST,MILL
C      WRITE(10,50)EST,MILL
C      50 FORMAT(/T16,'THE SOFTWARE ESTIMATE IS ',F6.2,A2)
C      /* GET HARDWARE TOTALS */
C      CALL GETHW
C      DENM2=7
C      WRITE(5,60)DEVCS,DENM2,PROCS,DENM3
C      WRITE(10,60)DEVCS,DENM2,PROCS,DENM3
C      60 FORMAT(T16,'THE HARDWARE DEVELOPMENT COSTS ARE ',F6.1,A2,/,
C      1,/,
C      T16,'THE HARDWARE PRODUCTION COSTS ARE ',F6.1,A2)
C      /* CALCULATE OASIS COST */

```

55

```

C
IF(AMS .EQ. R)GO TO 4000
IF(AMS .EQ. E)GO TO 3000
SUM=SUM+1
K=SUM
COUNT(K)=K
WRITE(5,72)
72 FORMAT(' ENTER SOFTWARE ESTIMATE .')
1 READ(5,82)VALUE(K)
82 FORMAT(F8.2)
WRITE(5,92)
92 FORMAT(' ENTER COMMENTS .')
10 READ(5,102)(COMMENT(K,J),J=1,6)
102 FORMAT(6A4)
WRITE(5,112)
112 FORMAT(' ENTER DATE .')
10 READ(5,122)(DATE(K,J),J=1,3)
122 FORMAT(3A4)
C
REVIEW 8
WRITE(6,126)SUM
126 FORMAT(I2)
WRITE(5,128)(TITLE(I,J),J=1,19)
WRITE(6,128)(TITLE(I,J),J=1,19)
128 FORMAT(19A4)
DO 137 I=1,2
WRITE(5,132)(LINE(I,J),J=1,19)
WRITE(6,132)(LINE(I,J),J=1,19)
132 FORMAT(19A4)
137 CONTINUE
DO 152 K=1,SUM
WRITE(5,142)COUNT(K),VALUE(K),COMMENT(K,J),J=1,6),
1 (DATE(K,J),J=1,3)
WRITE(6,142)COUNT(K),VALUE(K),COMMENT(K,J),J=1,6),
1 (DATE(K,J),J=1,3)
142 FORMAT(T4,I2,T7,F8.2,T23,6A4,T34,3A4)
152 CONTINUE
GO TO 1000
C
2000 WRITE(5,162)
162 FORMAT(' WHICH ESTIMATE?')
10 READ(5,*)INPUT
I=INPUT
EST=VALUE(I)
GO TO 1000
C
2000 FLAG=ON
4000 RETURN
END
C
SUBROUTINE GETHW
C SUBROUTINE GETHW RETRIEVES DEVELOPMENT AND PRODUCTION
C FUNCTION HARDWARE TOTALS FOR A PARTICULAR HARDWARE
C LIST
C INPUTS HARDWARE TOTALS
C OUTPUTS HARDWARE TOTALS
C DESCRIPTION
C SUBROUTINE GETHW

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00001110
00001120
00001170
00001140
00001150
00001160
00001170
00001180
00001190
00001200
00001210
00001220
00001230
00001240
00001250
00001260
00001270
00001280
00001290
00001300
00001310
00001320
00001330
00001335
00001337
00001338
00001340
00001350
00001360
00001370
00001380
00001390
00001400
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00001470
00001480
00001490
00001500
00001510
00001520
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00001570
00001580
00001590
00001600
00001610
00001620
00001630
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00001650
00001660
00001670
00001680

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C
      DIMENSION TITLE(1,20),STAR(1,20),TEXT(1,20),LINE(1,20)
      COMMON FLAG,EST,DEVCS,PROCS,DENM2,DENM3
      INTEGER SUM,TITLE,STAR,LINE,TEXT
      READ(7,4)SUM,TITLE,STAR
      4 FORMAT(12/20A4/20A4)
      DO 24 I=1,SUM
        READ(7,14)(TEXT(I,J),J=1,20)
        14 FORMAT(20A4)
      24 CONTINUE
      READ(7,34)(LINE(I,J),J=1,20)
      34 FORMAT(20A4)
      READ(7,44)DEVCS,DENM2,PROCS,DENM3
      44 FORMAT(1A0,F8.1,A2,I54,F8.1,A2)
      RETURN
      END
00001690
00001700
00001710
00001720
00001730
00001740
00001750
00001760
00001770
00001780
00001790
00001800
00001810
00001820
00001830
00001840

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00000001
00000005
00000006
00000007
00000010
00000020
00000030
00000040
00000050
00000060
00000070
00000080
00000090
00000100
00000110
00000120
00000130
00000140
00000150
00000160
00000170
00000180
00000190
00000200
00000210
00000220
00000230
00000240
00000250
00000260
00000270
00000280
00000290
00000300
00000310
00000320
00000330
00000340
00000350
00000360
00000370
00000380
00000390
00000395
00000400
00000410
00000415
00000417
00000418
00000420
00000430
00000440
00000450
00000460
00000470
00000480
00000490
00000500
00000510
00000520
00000530

C----- THE SENTINEL BRIGHT COST MODELS PROGRAM
C CATHARINE M. COLECCI
C MARCH 1983
C-----
C MODULE : USAP
C FUNCTION : RUNS AIR FORCE COST MODEL FOR SPECIFIC HARDWARE
C             CONFIGURATION AND SOFTWARE ESTIMATE.
C INPUTS : TOTAL HARDWARE DEVELOPMENT AND PRODUCTION COSTS.
C           SOFTWARE ESTIMATES
C OUTPUTS : COST CALCULATIONS TO SPECIFIED OUTPUT FILE
C-----
C DIMENSION TITLE(1,23),NO(25),STEP(25,23),DATE(1,5)
C COMMON FLAG,EST,DEVCS,PROCS,DEMOM2,DEMOM3,THOU,MILL,FLAG,ON,OFF,CASE,
C INTEGER NO,STEP,SUM,DEMOM2,DEMOM3,THOU,MILL,FLAG,ON,OFF,CASE,
C DATE
C REAL *4 DEVCS,PROCS,EST,AFCS,MCOST
C DATA THOU/'K'/,MILL/'M'/,ON/'1'/,OFF/'0'/
C FLAG=OFF
C CASE=0
C
C /* GET AIR FORCE MODEL */
C READ(9,10)SUM
C 10 FORMAT(12)
C READ(9,20)TITLE(1,J),J=1,23)
C 20 FORMAT(23A3)
C WRITE(5,20)TITLE(1,J),J=1,23)
C DO 40 I=1,SUM
C READ(9,30)STEP(1,J),J=1,23)
C 30 FORMAT(23A3)
C WRITE(5,30)STEP(1,J),J=1,23)
C 40 CONTINUE
C /* GET SOFTWARE ESTIMATE */
C 1000 CALL SWEET
C CASE=CASE+1
C IF(FLAG.EQ.ON)GO TO 2000
C IF(CASE.GT.1)GO TO 1200
C WRITE(5,45)
C 45 FORMAT/' ENTER TODAY'S DATE.'/
C READ(5,47)DATE(1,J),J=1,5)
C 47 FORMAT(5A4)
C WRITE(5,48)DATE(1,J),J=1,5),CASE
C WRITE(10,48)DATE(1,J),J=1,5),CASE
C 48 FORMAT('T30,S44,///T3,CASE',13,
C           '.....')
C GO TO 1250
C 1200 WRITE(5,49)CASE
C WRITE(10,49)CASE
C 49 FORMAT('T3,CASE',13,
C           '.....')
C 1250 WRITE(5,50)EST,MILL
C WRITE(10,50)EST,MILL
C 50 FORMAT('T14,THE SOFTWARE ESTIMATE IS',F6.2,A2)
C /* GET HARDWARE TOTALS */
C CALL GETHW
C REMIND 7
C /* CALCULATE AIR FORCE COST */
C IF(DEMOM2.EQ.THOU)DEVCS=DEVCS/1000
C IF(DEMOM2.EQ.THOU)DEMOM2=MILL
C IF(DEMOM3.EQ.THOU)PROCS=PROCS/1000
C IF(DEMOM3.EQ.THOU)DEMOM3=MILL

```

```

C
HMCOST=DEVCS1*PROCS1
AFCOST=(HMCOST*2.61)*(EST=1.20)
WRITE(9,82)HMCOST,DEMON3
WRITE(10,82)HMCOST,DEMON3
82 FORMAT(14,'THE TOTAL HARDWARE CONFIGURATION COST IS:',F8.2,A2)
WRITE(9,70)AFCOST,DEMON2
WRITE(10,70)AFCOST,DEMON2
70 FORMAT(19,'THE AIR FORCE MODEL COST ESTIMATE IS:',F8.1,A2)
REWINO 8
GO TO 1000
2000 STOP
END
C
SUBROUTINE SWEST
C FUNCTION : SWEST
C ALLOW USER TO SAVE VARIOUS SOFTWARE ESTIMATES
C AND SELECT THE APPROPRIATE ESTIMATE FOR A
C COST MODEL RUN.
C INPUTS : SOFTWARE ESTIMATES
C OUTPUTS :
C DESCRIPTION :
C
SUBROUTINE SWEST
DIMENSION COUNT(50),VALUE(50),COMMENT(50,6),DATE(50,3),TITLE(1,19)
COMMON FLAG,EST
REAL*4 VALUE,EST
INTEGER*4 COMMENT,DATE,SUM,COUNT,TITLE,ANS,INPUT,A,R,E,C,FLAG,DW,
OFF,LINE
DATA A//A//C//C//R//R//E//E//ON//1//OFF//0//
READ(6,2)SUM
2 FORMAT(I2)
READ(6,4)(TITLE(1,J),J=1,19)
4 FORMAT(19A4)
WRITE(9,8)(TITLE(1,J),J=1,19)
6 FORMAT(19A4)
DO 14 I=1,2
READ(8,12)(LINE(I,J),J=1,19)
12 FORMAT(19A4)
WRITE(9,12)(LINE(I,J),J=1,19)
14 CONTINUE
DO 32 J=1,SUM
READ(6,22)COUNT(1),VALUE(1),COMMENT(1,J),J=1,6).
32 CONTINUE
1000 WRITE(5,52)
52 FORMAT(19,'WOULD YOU LIKE TO:./
1 , A)DO A NEW SOFTWARE ESTIMATE./
2 , C)HOSE AN OLD ONE./
3 , R)RUN COST MODEL./
4 , F)EXIT./
C
READ(5,62)ANS
62 FORMAT(I2)
IF(ANS.EQ.C)GO TO 2000
IF(ANS.NE.O)WICH TO 4000

```



```

C
IF(ANS EQ. E) GO TO 3000
SUM=SUM+1
K=SUM
COUNT(K)=K
WRITE(5,72)
72 FORMAT(' ENTER SOFTWARE ESTIMATE IN MILLIONS ',/
1, '(INCLUDE DECIMAL POINT)')
READ(5,82)VALUE(K)
82 FORMAT(F8.2)
WRITE(5,92)
92 FORMAT(' ENTER COMMENTS:')
READ(5,102)(COMMENT(K,J),J=1,8)
102 FORMAT(644)
WRITE(5,112)
112 FORMAT(' ENTER DATE:')
READ(5,122)(DATE(K,J),J=1,3)
122 FORMAT(344)
C
REWIND 8
WRITE(8,126)SUM
126 FORMAT(I2)
DO 137 I=1,3
WRITE(8,132)(TITLE(I,J),J=1,19)
132 FORMAT(1944)
137 CONTINUE
DO 152 K=1,SUM
WRITE(5,142)COUNT(K),VALUE(K),(COMMENT(K,J),J=1,6),
1 (DATE(K,J),J=1,3)
1 WRITE(8,142)COUNT(K),VALUE(K),(COMMENT(K,J),J=1,6),
1 (DATE(K,J),J=1,3)
142 FORMAT(T4,12,17,F8.2,123,644,134,344)
152 CONTINUE
GO TO 1000
C
2000 WRITE(5,182)
182 FORMAT(' WHICH ESTIMATE?')
READ(5,*)INPUT
I=INPUT
EST=VALUE(I)
GO TO 1000
C
3000 FLAG=DN
4000 RETURN
END
C
C-----
C SUBROUTINE GETHW
C FUNCTION RETRIEVES DEVELOPMENT AND PRODUCTION
C HARDWARE TOTALS FOR A PARTICULAR HARDWARE
C LIST
C INPUTS
C OUTPUTS
C DESCRIPTION
C-----
SUBROUTINE GETHW
DIMENSION TITLE(1,20),STAR(1,20),TEXT(1,20),LINE(1,20)
COMMON FLAG,EST,DEVCS,PROCS,DENOM2,DENOM3
INTEGER SUM,TITLE,STAR,LINE,TEXT

```

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00001150
00001160
00001170
00001180
00001190
00001200
00001210
00001220
00001230
00001240
00001250
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00001280
00001290
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00001330
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00001470
00001480
00001490
00001500
00001510
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00001560
00001570
00001580
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```

      READ(7,4)SUM,TITLE,STAR
      4 FORMAT(12/20A4/20A4)
      DO 24 J=1,SUM
        READ(7,14)(TEXT(I,J),J=1,20)
        14 FORMAT(20A4)
      24 CONTINUE
      READ(7,34)(LINE(I,J),J=1,20)
      34 FORMAT(20A4)
      READ(7,44)DEVCS1,DENOM2,PROCS1,DENOM3
      44 FORMAT(140,F8.1,A2,T54,F8.1,A2)
      RETURN
      END

```

```

C----- THE SENTINEL BRIGHT COST MODEL'S PROGRAM
C
C CATHERINE M. COLECHI
C MARCH 1983
C-----
C
C MODULE : TERCON
C FUNCTION : RUNS TERCON COST MODEL FOR SPECIFIC HARDWARE
C            CONFIGURATION AND SOFTWARE ESTIMATE
C INPUTS : TOTAL HARDWARE DEVELOPMENT AND PRODUCTION COSTS,
C           SOFTWARE ESTIMATES
C OUTPUTS : COST CALCULATIONS TO SPECIFIED OUTPUT FILE
C-----
C
C DIMENSION TITLE(1,23),NO(25),STEP(25,23),DATE(1,5)
C COMMON FLAG,EST,DEVST,PROGST,DENM2,DENM3
C INTEGER NO,STEP,SUM,DENM2,DENM3,THOU,MILL,FLAG,ON,OFF,CASE,
C          DATE
C REAL*4 DEVST,PROGST,EST,TERCST,MWCOST
C DATA THOU/'K',MILL/'M',DN/'1'/.OFF/'0'/
C FLAG=OFF
C CASE=0
C
C          /* GET TERCON MODEL */
C READ(9,10)SUM
C 10 FORMAT(12)
C READ(9,20)(TITLE(1,J),J=1,23)
C 20 FORMAT(23A3)
C WRITE(5,20)(TITLE(1,J),J=1,23)
C DO 40 I=1,SUM
C 30 READ(9,30)(STEP(I,J),J=1,27)
C 40 FORMAT(23A3)
C WRITE(9,30)(STEP(I,J),J=1,23)
C 40 CONTINUE
C          /* GET SOFTWARE ESTIMATE */
C 1000 CALL SWEST
C CASE=CASE+1
C IF(FLAG.EQ. DN)GO TO 2000
C IF(CASE.GT. 1)GO TO 1200
C WRITE(5,45)
C 45 FORMAT(' ENTER TODAY'S DATE ')
C READ(5,47)(DATE(1,J),J=1,5)
C 47 FORMAT(5A4)
C WRITE(5,48)(DATE(1,J),J=1,5),CASE
C WRITE(10,48)(DATE(1,J),J=1,5),CASE
C 48 FORMAT('///T30.5A4,///T3, 'CASE',13,' .....')
C 1
C GO TO 1250
C 1200 WRITE(10,49)CASE
C WRITE(5,49)CASE
C 49 FORMAT('///T3, 'CASE',13,' .....')
C 1
C 1250 WRITE(5,50)EST,MILL
C WRITE(10,50)EST,MILL
C 50 FORMAT('///T5, THE SOFTWARE ESTIMATE IS .F6 2.A2)
C          /* GET HARDWARE TOTALS */
C CALL GETHW
C REWIND 7
C          /* CALCULATE TERCON COST */
C IF(DENM2.EQ. THOU)DEVST=DEVST/1000
C IF(DENM2.EQ. THOU)DENM2=MILL
C IF(DENM3.EQ. THOU)PROGST=PROGST/1000
C IF(DENM3.EQ. THOU)DENM3=MILL

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C
HMCOST=DEVCST+PROCST
TERCST=(HMCOST*.25)+IFST*.2 10)
WRITE(5,62)HMCOST,DENMOM3
WRITE(10,62)HMCOST,DENMOM3
62 FORMAT(15,'THE TOTAL HARDWARE CONFIGURATION COST IS: ',F8.2,A2)
WRITE(5,70)TERCST,DENMOM2
WRITE(10,70)TERCST,DENMOM2
70 FORMAT(113,'**THE TERCON MODEL COST ESTIMATE IS: ',F8.1,A2)
REWIND 8
GO TO 1000
2000 STOP
END
C-----
C SUBROUTINE : SWEST
C FUNCTION : ALLOWS USER TO SAVE VARIOUS SOFTWARE ESTIMATES
C AND SELECT THE APPROPRIATE ESTIMATE FOR A
C COST MODEL RUN.
C INPUTS : SOFTWARE ESTIMATES
C OUTPUTS :
C DESCRIPTION :
C-----
SUBROUTINE SWEST
DIMENSION LINE(50),VALUE(50),COMENT(50,6),DATE(50,3),TITLE(1,19),
COMMON FLAG,EST
REAL*4 VALUE,EST
INTEGER*4 COMENT,DATE,SUM,COUNT,TITLE,ANS,INPUT,A,R,E,C,FLAG,OM,
OFF,LINE
DATA A/'A','C','C','R','R','E','E','OM','I','OFF','O'/
READ(8,2)SUM
2 FORMAT(12)
READ(8,4)(TITLE(1,J),J=1,19)
4 FORMAT(19A4)
WRITE(5,6)(TITLE(1,J),J=1,19)
6 FORMAT(19A4)
DO 14 I=1,2
READ(8,12)(LINE(1,J),J=1,19)
12 FORMAT(19A4)
WRITE(5,12)(LINE(1,J),J=1,19)
14 CONTINUE
DO 22 I=1,SUM
READ(8,22)(COUNT(1),VALUE(1),COMENT(1,1),J=1,6),
(DATE(1,J),J=1,3)
22 FORMAT(14,12,17,F8.2,13,3A4)
WRITE(5,22)(COUNT(1),VALUE(1),COMENT(1,1),J=1,6),
(DATE(1,J),J=1,3)
32 CONTINUE
1000 WRITE(5,52)
52 FORMAT(1,'WOULD YOU LIKE TO: ',
1 'A)DO A NEW SOFTWARE ESTIMATE',/
2 'C)CHOOSE AN OLD ONE',/
3 'R)RUN COST MODEL',/
4 'E)EXIT')
C READ(5,62)ANS
62 FORMAT(A2)
IF(ANS.EQ.C)GO TO 2000
IF(ANS.EQ.R)GO TO 4000

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00000750
00000760
00000770
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00000790
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00000810
00000820
00000830
00000840
00000850
00000860
00000870
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00000940
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00001000
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00001080
00001090

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C
      IF (ANS .EQ. E) GO TO 3000
      SUM=SUM+1
      K=SUM
      CONT(K)=K
      WRITE(5,72)
72  FORMAT(' ENTER SOFTWARE ESTIMATE IN MILLIONS .')
      1 READ(5,82)VALUE(K)
      82 FORMAT(F8.2)
      WRITE(5,92)
92  FORMAT(' ENTER COMMENTS ')
      READ(5,102)((COMMENT(K,J),J=1,6)
102  FORMAT(64)
      WRITE(5,112)
112  FORMAT(' ENTER DATE ')
      READ(5,122)(DATE(K,J),J=1,3)
122  FORMAT(344)
C
      REWIND 8
      WRITE(6,126)SUM
126  FORMAT(12)
      DO 137 I=1,3
        WRITE(5,132)(TITLE(I,J),J=1,19)
        WRITE(6,132)(TITLE(I,J),J=1,19)
132  FORMAT(1944)
137  CONTINUE
      DO 152 K=1,SUM
        1 WRITE(5,142)COUNT(K),VALUE(K), (COMMENT(K,J),J=1,6)
        1 WRITE(6,142)COUNT(K),VALUE(K), (COMMENT(K,J),J=1,6)
        1 WRITE(5,142)COUNT(K),VALUE(K), (COMMENT(K,J),J=1,6)
        1 WRITE(6,142)COUNT(K),VALUE(K), (COMMENT(K,J),J=1,6)
142  FORMAT(T4,12,17,F8.2,F23.644,T34,344)
152  CONTINUE
      GO TO 1000
C
2000  WRITE(5,182)
182  FORMAT(' WHICH ESTIMATE?')
      READ(5,*)INPUT
      I=INPUT
      EST=VALUE(I)
      GO TO 1000
C
3000  FLAG=ON
4000  RETURN
      END
C
C-----
C  SUBROUTINE GETHW
C  FUNCTION RETRIEVES DEVELOPMENT AND PRODUCTION
C  HARDWARE TOTALS FOR A PARTICULAR HARDWARE
C  LIST
C  INPUTS :
C  OUTPUTS :
C  DESCRIPTION :
C-----
      SUBROUTINE GETHW
      DIMENSION TITLE(1,20), START(1,20), TEXT(1,20), (INF(1,20)
      COMMON FLAG,EST,DEVCST,PROCS,DENMW2,DENMW3
      INTEGER SUM,TITLE,STAR,LINE,TEXT

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00001190
00001800
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00001820

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      READ(7,4)SUM,TITLE,STAR
4  FORMAT(12/20A4/20A4)
      DO 24 I=1,SUM
        READ(7,4)(TEXT(I,J),J=1,20)
        FORMAT(20A4)
24  CONTINUE
      READ(7,34)(LINE(I,J),J=1,20)
34  FORMAT(20A4)
      READ(7,44)DEVCS1,DENOM2,PROCS1,DENOM3
44  FORMAT(140,F8.1,A2,F54,F8.1,A2)
      RETURN
      END

```

[illegible]

```

C----- THE SENTINEL BRIGHT COST MODELS PROGRAM
C CATHARINE M. COLECCCHI
C MARCH 1983
C-----
C MODULE : SOFTWARE
C FUNCTION: CREATES FILE IN WHICH TO STORE SOFTWARE ESTIMATES
C INPUTS : SOFTWARE ESTIMATES, COMMENTS, DATE
C OUTPUTS : SOFTWARE ESTIMATES, COMMENTS, DATE TO
C SPECIFIED FILE
C-----
C DIMENSION COUNT(50), VALUE(50), COMMENT(50,6), DATE(50,3), TITLE(1,19)
C REAL*4 VALUE
C INTEGER*4 COUNT, DATE, SUM, COUNT, TITLE
C
C SUM=0
C DO 60 I=1,50
C SUM=SUM+1
C COUNT(I)=1
C WRITE(5,10)
C 10 FORMAT(' ENTER SOFTWARE ESTIMATE IN MILLIONS: ')
C READ(5,15) VALUE(I)
C 15 FORMAT(F8.2)
C IF(VALUE(I) .EQ. 0.0) GO TO 1000
C WRITE(5,20)
C 20 FORMAT(' ENTER COMMENTS: ')
C READ(5,30) (COMMENT(I,J), J=1,6)
C 30 FORMAT(8A2)
C WRITE(5,40)
C 40 FORMAT(' ENTER DATE: ')
C READ(5,50) (DATE(I,J), J=1,3)
C 50 FORMAT(3A4)
C 60 CONTINUE
C
C 1000 SUM=SUM-1
C WRITE(8,70) SUM
C 70 FORMAT(I2)
C 75 FORMAT('6. *** CURRENT SOFTWARE ESTIMATES DISPLAYED IN',
C ' MILLIONS ***')
C WRITE(8,77)
C 77 FORMAT('
C WRITE(8,80)
C 80 FORMAT('10. 'VALUE', T22, 'COMMENTS', T36, 'DATE')
C DO 100 J=1, SUM
C WRITE(8,90) (COUNT(I), VALUE(I), (COMMENT(I,J), J=1,6),
C (DATE(I,J), J=1,3))
C 90 FORMAT('14.12, T7, F8.2, T23, 6A2, T34, 3A4)
C 100 CONTINUE
C WRITE(5,110)
C 110 FORMAT(' YOUR FILE HAS BEEN SAVED')
C STOP
C END

```


DATE
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— 8