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User Manual for Conservation Project Data Base

B. A. Garrett-Price
L. L. Fassbender

June 1985

Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
Operated for the U.S. Department of Energy
by Battelle Memorial Institute

Battelle

PNL-5512

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PACIFIC NORTHWEST LABORATORY
operated by
BATTELLE
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UNITED STATES DEPARTMENT OF ENERGY
under Contract DE-AC06-76RLO 1830

Printed in the United States of America
Available from
National Technical Information Service
United States Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161

NTIS Price Codes
Microfiche A01

Printed Copy

Pages	Price Codes
001-025	A02
026-050	A03
051-075	A04
076-100	A05
101-125	A06
126-150	A07
151-175	A08
176-200	A09
201-225	A010
226-250	A011
251-275	A012
276-300	A013

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Pacific Northwest Laboratory
Richland, Washington 99352

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SUMMARY

This User Manual describes the Conservation Project Data Base developed by the Pacific Northwest Laboratory for the Department of Energy's Office of Conservation (CE). The purpose of this data base is to provide a centralized storehouse of information on planned and ongoing projects funded by CE. The data base is a powerful analytical tool that will enable CE to quickly analyze the composition of their project portfolio. The data base uses dBase III[a] on an IBM PC[b]. Over 80 data items are stored for each project. A menu-driven applications program was developed as an alternative to using standard dBase III commands. The menu-driven program prompts the user to add data, edit data, perform on-screen searches of the data base, sort the data base by any variable or combination of variables, or print hard-copy reports of various data items.

(a) dBase III is a trademark of Ashton-Tate, Culver City, California.

(b) IBM PC is a trademark of International Business Machines Corporation, Boca Raton, Florida.

1.0 INTRODUCTION

This User Manual documents the development of the Conservation Project Data Base for DOE's Office of Conservation (CE). It is the culmination of an 8-month effort that began in October 1984 with the conceptual design of the CE Project Data Sheet. The data sheet has undergone extensive modifications by a DOE working group of representatives from each of the Program Offices:

- Building Energy Research and Development
- Industrial Programs
- Vehicle and Engine R&D
- Energy Systems Research

The final version of the data sheet is shown in Figure 1.1.

Once the final format of the data sheet was determined, each of the Offices was asked to distribute copies to its DOE Project Managers to gather information on all of the projects managed by them. This data was collected and entered into the CE Project Data Base. Computer-generated reports on all the projects in the data base were then distributed to the Project Managers to review and, if necessary, correct the information. Changes were incorporated into the data base as received by PNL.

The objective of this User Manual is to provide users of the CE Project Data Base with a basic understanding of the program operation and its capabilities. The manual presents an overview of the data base; descriptions of the main data files; a detailed discussion of the applications program that allows the user to add data, edit data, print reports, and perform on-screen searches; and a trouble-shooting guide in case something goes wrong. Also included are program listings and sample reports.

PNL selected dBase III as the data base management system for the CE Project Data Base because of its flexibility in sorting and reporting, and its large data storage capability. With dBase III the user can sort the data by any variable or combination of variables and report the results in any manner desired. The dBase III program allows 128 fields per record, which is adequate for the CE Project Data Base content. The dBase III program is compatible with the IBM PC, XT, or any IBM PC-compatible computer. The following are required:

- 256K bytes RAM memory
- Two 5-1/4 inch 360K byte diskette drives or one fixed disk drive and one diskette drive
- PC-DOS 2.0 (or a later version) operating system.

CONSERVATION PROJECT DATA SHEET

2-7-85

1. Project title

2. Project identification

A. Program _____ B. Subprogram _____

C. Area _____

D. Key activity _____

3. DOE project manager

A. Name _____

B. Phone ( ) -

4. Contractor's project manager

A. Name (Last, First, MI) _____

B. Research organization _____

C. Business address: Street _____

City _____ State _____ Zip _____

D. Phone ( ) - E. Type of organization _____

5. Description

6. Justification

7. Program interrelationships A. Mandated project ☐ B. Program support ☐

C. Necessary for completion of another project ☐ -- If yes, enter title of dependent project:

_____ D. None of the above ☐

8. Project category _____

9. R&D phase

A. At start of FY 1987 _____ B. At project completion _____

10. Technical keywords

A. Disciplines _____

B. Materials _____

C. Techniques _____

D. Phenomena _____

E. Environment _____

F. Other _____ _____

FIGURE 1.1

CONSERVATION PROJECT DATA SHEET
(CONTINUED)

2-7-85

11. Energy savings

Form	10^{12} Btu/Year
A. Oil	
B. Gas	
C. Coal	
D. Other	
E. Electricity (@ 3412 Btu/kWh)	
F. Electric losses (@ 8091 Btu/kWh saved)	
G. Primary energy not specified by kind	
H. Net savings (sum of the above)	
I. Not applicable ☐	

12. Assumptions

A. Per-unit annual savings

B. Year 2010 market (number of units) _____

C. Maximum potential market penetration (%) _____

D. Market penetration curve

Year a _____

Year b _____

Year c _____

13. Acceleration period (number of years) _____

14. Other energy-related benefits

A. Multiple fuel capability ☐

B. Alternative fuel benefits ☐

C. Energy storage benefit ☐

D. Electric load management benefit ☐

15. Non-energy benefits

A. Technology leadership _____

B. Industrial competitiveness _____

C. National security _____

D. System reliability _____

E. Public health _____

F. Environmental quality _____

G. Reduced consumer costs _____

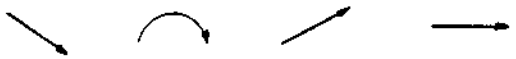
H. Employment _____

16. Project costs

A. DOE budgetary costs	$ millions
Sunk through FY 86	
FY 87	
FY 88	
FY 89	
FY 90	
FY 91	
Cumulative FY 87 through completion	

B. Private sector contributions	$ millions
Sunk through FY 86	
Cumulative FY 87 through completion	

17. Funding profile



☐ ☐ ☐ ☐ ☐

18. Additional information

2.0 OVERVIEW OF CONSERVATION PROJECT DATA BASE

PNL developed this computerized data base of information on all CE projects funded by the Offices of:

- Building Energy Research & Development
- Industrial Programs
- Vehicle and Engine R&D
- Energy Systems Research
  - Energy Conversion and Utilization Technology
  - Electric Energy Systems
  - Energy Storage

The data base contains the following items for each project:

- Project title
- Project identification
- DOE Project Manager
- Contractor's project manager
- Description
- Justification
- Program interrelationships
- Project category
- R&D phase
- Technical keywords
- Energy savings
- Assumptions
- Acceleration period
- Other energy-related benefits
- Non-energy benefits
- Project costs
- Funding profile
- Additional information

3.0 DATA FILES

The entire CE Project Data Base is stored on a hard disk and, in addition, each individual Office's[a] data base is stored on a separate floppy disk. There are three separate data files for each Office: a general file, a memo file, and a keyword file. The project descripions, justifications, and keywords are stored in separate files because they consist of long strings of textual information that is time-consuming to sort. The general file contains general project information plus data on project benefits and costs. The memo file contains the project descriptions, justifications, and any additional notes. The keyword file contains several categories of descriptive keywords about the projects. In addition to the three main data files, there are 6 utility files that serve as reference tables for the codes used in the project data files. The structure and contents of the utility files are listed in Appendix D. Each of the data files is discussed below.

3.1 CEGEN

The CEGEN file contains all of the general information about the CE projects stored in the data base. Table 3.1 lists the names, types, widths, and descriptions of the fields in the general file. Each Office has an individual general file of its own. The file names are shown in Table 3.2.

3.2 CEMEM

The CEMEM file is a memo file that contains the project descriptions and justifications as well as any additional information that may be stored about any of the projects. Table 3.3 lists the names, types, widths, and descriptions of the fields in the memo file. The individual Office memo file names are shown in Table 3.2.

3.3 CEKEY

The CEKEY file contains descriptive technical keywords for each project. The keyword categories are: Disciplines, Materials, Techniques, Phenomena, Environment, and Other. Each project can have up to three keywords in each of the six categories. Table 3.4 lists the names, types, widths and descriptions of the fields in the keyword file. The individual Office keyword file names are shown in Table 3.2.

(a) There is no data base for the entire Office of Energy Systems Research. Instead, there are three separate data bases for the three program areas funded by this Office: Energy Conversion and Utilization Technology, Electric Energy Systems, and Energy Storage. These three program areas are loosely referred to as "Offices" in this User Manual.

TABLE 3.1. CEGEN File Structure

Field	Name	Type	Width	Decimals	Field Description
1	PRJND	Numeric	4		Project Number
2	PRG	Character	5		Program
3	SUBPRG	Character	4		Subprogram
4	AREA	Character	4		Area
5	KEYACT	Character	55		Key Activity
6	TITLE	Character	60		Title
7	DOEPM	Character	25		DDE Project Manager
8	DOEPH	Character	12		DOE Project Manager's Phone #
9	CONPM	Character	25		Contractor's Project Manager
10	CONORG	Character	40		Contractor's Organization
11	CONSTR	Character	35		Street Address
12	CONCITY	Character	20		City
13	CONSTATE	Character	2		State
14	CONZIP	Character	5		Zip Code
15	CONPH	Character	12		Contractor's Phone Number
16	CONTYPE	Character	1		Type of Contractor
17	LAW	Character	1		Mandated by Law (Y/N)
18	PRGSUP	Character	1		Program Support (Y/N)
19	OTHPRJ	Character	1		Necessary for Completion of Other Project (Y/N)
20	OTHNAM	Character	55		Name of Other Project
21	PRJCAT	Character	2		Project Category
22	PHASE1	Character	2		R&D Phase at Start of FY87
23	PHASE2	Character	2		R&D Phase at Project Completion
24	PR1	Character	1		Project Priority (Non-Discretionary)

TABLE 3.1. CEGEN File Structure (Continued)

Field	Name	Type	Width	Decimals	Field Description
25	PR2	Numeric	2		Project Priority (Discretionary)
26	PR3	Numeric	3		Project Priority (Overall)
27	PR4	Numeric	2		Project Priority (Spare)
28	OIL	Numeric	6	1	Oil Savings (Trillion Btu/yr)
29	GAS	Numeric	6	1	Gas Savings (Trillion Btu/yr)
30	COAL	Numeric	6	1	Coal Savings (Trillion Btu/yr)
31	OTHFUEL	Numeric	6	1	Other Fuel Savings (Trillion Btu/yr)
32	ELECT1	Numeric	6	1	Electrical Savings (Trillion Btu/yr)
33	ELECT2	Numeric	7	1	Electrical Losses (Trillion Btu/yr)
34	UNSPC	Numeric	6	1	Unspecified Savings (Trillion Btu/yr)
35	NETSAV	Numeric	8	1	Net Savings (Trillion Btu/yr)
36	ANNSAV	Character	40		Per-Unit Annual Savings
37	MARKET	Character	10		Year 2010 Market
38	MKTMAX	Numeric	3		Maximum Market Penetration Potential (%)
39	MKTY1	Character	4		Year When 10% of Maximum is Reached
40	MKTY2	Character	4		Year When 50% of Maximum is Reached
41	MKTY3	Character	4		Year When 90% of Maximum is Reached
42	ACCY	Character	2		Acceleration Period (Years)
43	MULTI	Character	1		Multiple Fuel Capability (Y/N)

TABLE 3.1. CEGEN File Structure (Continued)

Field	Name	Type	Width	Decimals	Field Description
44	ALTFUEL	Character	1		Alternative Fuel Capability (Y/N)
45	STOR	Character	1		Energy Storage Benefit (Y/N)
46	ELOAD	Character	1		Electric Load Management Benefit (Y/N)
47	NE1	Character	2		Non-Energy Benefit
48	NE2	Character	2		Non-Energy Benefit
49	NE3	Character	2		Non-Energy Benefit
50	NE4	Character	2		Non-Energy Benefit
51	NE5	Character	2		Non-Energy Benefit
52	SUNK	Numeric	7	3	DOE Sunk Costs
53	FY87	Numeric	6	3	FY87 Budget
54	FY88	Numeric	6	3	FY88 Budget
55	FY89	Numeric	6	3	FY89 Budget
56	FY90	Numeric	6	3	FY90 Budget
57	FY91	Numeric	6	3	FY91 Budget
58	TOTAL	Numeric	8	3	Cumulative DOE Cost to Completion
59	PSSUNK	Numeric	6	3	Private Sector Sunk Costs
60	PSTOT	Numeric	8	3	Cumulative Private Costs to Completion
61	FPROF	Character	1		Funding Profile

TABLE 3.2. Individual Office Data File Names

Office	General File Name	Memo File Name	Keyword File Name
Building Energy Research and Development	BCSGEN	BCSMEM	BCSKEY
Energy Conversion and Utilization Technology	ECTGEN	ECTMEM	ECTKEY
Electric Energy Systems	EESGEN	EESMEM	EESKEY
Energy Storage	ESGEN	ESMEM	ESKEY
Industrial Programs	IPGEN	IPMEM	IPKEY
Vehicle and Engine R&D	TPGEN	TPMEM	TPKEY

TABLE 3.3. CEMEM File Structure

Field	Name	Type	Width	Field Description
1	PRG	Character	5	Program
2	PRJNO	Numeric	4	Project Number
3	PRJDES	Memo	10	Project Description
4	JUST	Memo	10	Project Justification
5	NOTES	Memo	10	Additional Notes

TABLE 3.4. CEKEY File Structure

Field	Name	Type	Width	Field Description
1	PRG	Character	5	Program
2	PRJNO	Numeric	4	Project Number
3	DIS1	Character	30	Disciplines
4	DIS2	Character	30	Disciplines
5	DIS3	Character	30	Disciplines
6	MAT1	Character	30	Materials
7	MAT2	Character	30	Materials
8	MAT3	Character	30	Materials
9	TQ1	Character	30	Techniques
10	TQ2	Character	30	Techniques
11	TQ3	Character	30	Techniques
12	PH1	Character	30	Phenomena
13	PH2	Character	30	Phenomena
14	PH3	Character	30	Phenomena
15	EN1	Character	30	Environment
16	EN2	Character	30	Environment
17	EN3	Character	30	Environment
18	OT1	Character	30	Other
19	OT2	Character	30	Other
20	OT3	Character	30	Other

4.0 APPLICATIONS PROGRAM

An interactive, menu-driven program is provided to enter, edit, sort and report the data in the Conservation Project Data Base. The applications program has a modular design. Subroutines are called and executed from the main program (CEOATA) as shown in Figure 4.1. These subroutines are of three types: command files (file name extension .PRG), format files (file name extension .FMT), and report form files (file name extension .FRM). Command files consist of sets of instructions in dBase III programming language. Format files create custom screen formats for data entry or on-screen data display. Report form files provide a standard framework for reporting data base information. Each of the modules shown in Figure 4.1 is discussed in detail below. In addition, Appendix A contains program listings for the command files and the screen format files.

4.1 CEDATA

The CEDATA program controls the execution of the appropriate subroutines based on the application selected from the on-screen menu. The four main applications that can be called from the CEDATA program are: (1) adding data for new projects to the data bases, (2) editing existing project data, (3) reporting project data, and (4) searching the data base for projects that meet user-specified criteria. In addition, a help program can be called which describes the functions of the major command programs and refers the user to the appropriate sections of the User Manual.

Table 4.1 lists the steps used to initiate the CEDATA program. These instructions are based on the following system configuration:

- Disk Drive A is the default disk drive
- The Conservation Project Data Base and the applications program are stored on the hard disk
- dBase III is on the hard disk

TABLE 4.1. Executing the CEDATA Program

Step	Screen Response
1. Boot system with PC DOS.	A > (DOS prompt on Drive A)
2. Type D:, where D represents the hard disk designator, to change the logged disk drive to the hard disk	D > (DOS prompt on Hard Disk Drive)
3. Place the dBase III disk in Drive A	
4. Type DBASE to enter the dBase III program	. (dBase III dot command)
5. Remove the dBase III disk from Drive A	
6. Type DO CEDATA	Conservation Project Data Base banner shown in Figure 4.2 appears
7. Press any key to go to the next screen	The applications menu shown in Figure 4.3 appears

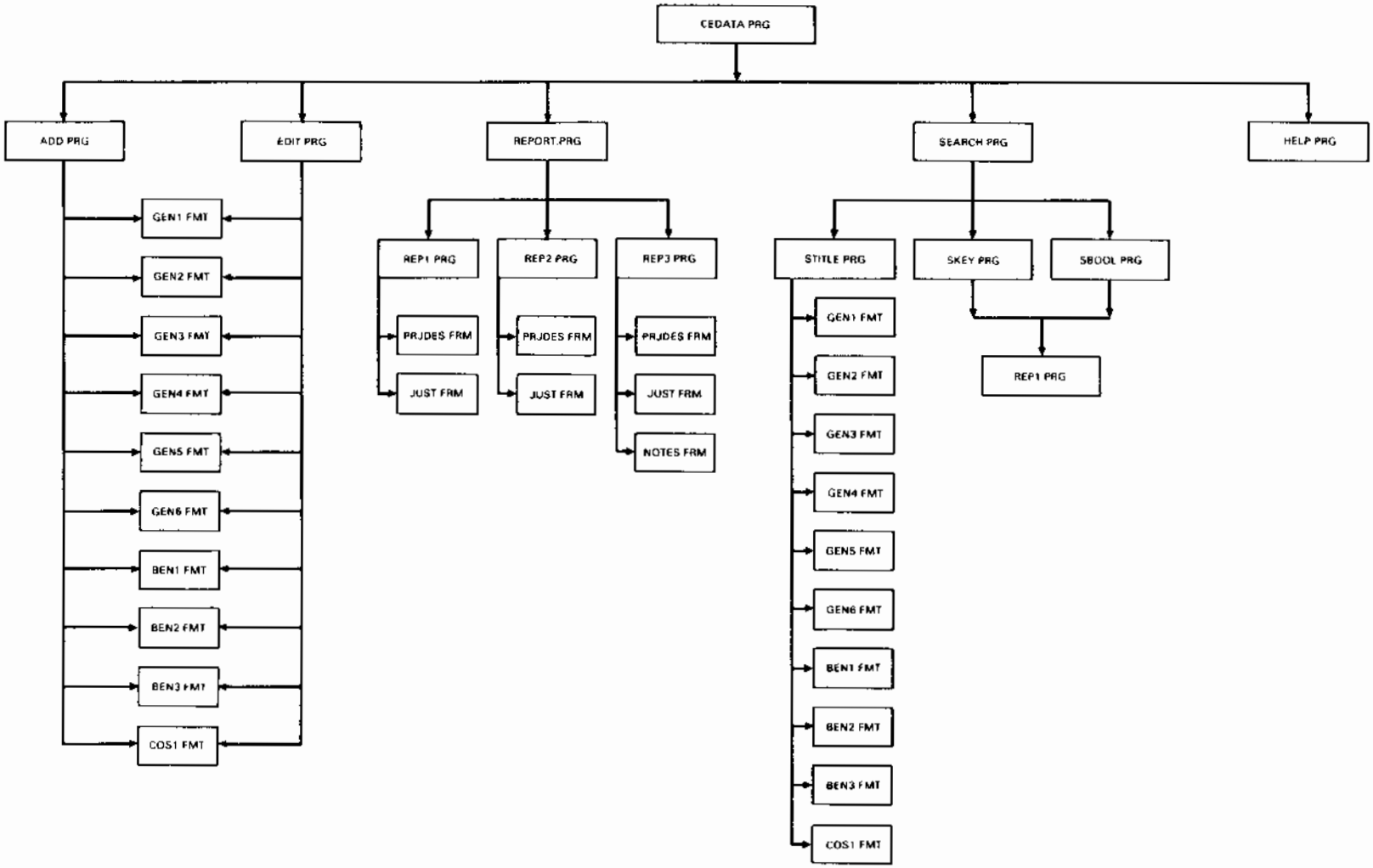


FIGURE 4.1. CE Data Base Program Structure

4.2 ADDING DATA

The data entry program (ADD.PRG) allows the addition of information for a project that is not currently in the data base. The ADD program is executed when the first option is selected from the applications menu of the CEDATA program. Data entry is accomplished through formatted screens that are called from the ADD program. These screens are stored as the following separate files:

File Name	Screen Number	Description
GEN1.FMT	1	Project title, identification, DOE project manager, contractor
GEN2.FMT	2	Program Interrelationships
GEN3.FMT	3	Project Category
GEN4.FMT	4	R&D Phase
GEN5.FMT	5	Keywords
GEN6.FMT	6	Keywords (cont.)
BEN1.FMT	7	Energy Savings
BEN2.FMT	8	Energy Savings Assumptions
BEN3.FMT	9	Non-Energy Benefits
COS1.FMT	10	Budgetary Information

The ADD program first asks the user to specify in which program area the project information is to be entered. The program area is selected by entering the associated number from the menu presented on the screen (Figure 4.4). The ADD program then presents ten formatted data-entry screens (Figures 4.5 through 4.14) in sequence for character and numeric data entry. Then, the user is asked to refer to the User Manual to enter the project description, justification and any project notes. After all the data for a given project is entered, the screen asks if data for another project is to be entered. If the user responds yes (Y), the program will again present the menu for selecting the program area. If the user responds no (N), the program returns to the applications menu in the CEDATA program (Figure 4.3). The following sections provide instructions for entering character/numeric data and memo data.

4.2.1 Entering Character and Numeric Data

All items, with the exception of the project description, justification, and additinal information (Items 5, 6, and 18 on the Conservation Project Data Sheet, Figure 1.1) are stored in character or numeric fields. All numeric and character data is stored in the data base in capital letters. Thus, before entering data, press the "Caps Lock" key. To enter data, simply type the requested information in the highlighted spaces provided on the formatted screens. If information is not entered in a given space, the data base will automatically store zeroes in numeric fields and blanks in character fields.

If the data completely fills the space provided, the cursor will automatically jump to the next item. If the data does not completely fill the space, use the "RETURN" key to move to the next item. The arrows on the right of the keyboard can be used to position the cursor at the desired location. When you are finished entering data on a particular screen, press "PgDn" to go to the next screen. Once you have exited a screen, you will not be able to go back to it while in the ADD program. If you want to change data items that you have entered on a previous screen, refer to Section 4.3 of this User Manual.

A space is not provided for entering the net energy savings. The program automatically calculates this total and displays it on the screen. The program also checks that the cumulative budgetary costs from FY87 through completion are greater than or equal to the sum of the entries for FY87 through FY91. If the cumulative figure is less than this sum, an error message will appear on the screen and the user will be given the opportunity to re-enter the data. The corrected data is simply typed over the top of the current data (with "INSERT" in the OFF mode).

Table 4.2 provides a list of commands that may be helpful in entering character and numeric data.

TABLE 4.2. Summary of Commands Useful for Data Entry

"Ctrl/Y" Deletes all data to the right of the cursor in a given field

"Del" or "Ctrl G" Deletes the character at the cursor position

"RETURN" Moves cursor to the next data item

"PgDn" or "Esc" Moves to the next formatted screen

"Ins" When ON, any text that is typed is inserted at the cursor position. When OFF, any text is typed over the top of existing text. ON/OFF mode is displayed in upper right-hand corner of screen.

4.2.2 Entering the Project Description, Justification and Additional Information

The project description, justification and additional information are stored in memo fields. The dBase III text editor is used to enter data into memo fields. After all of the character and numeric data are entered for a project, the screen displays the following:

> To add Project Description, Justification or Notes,
> refer to Section 4.2.2 of the User Manual.

Press any key to continue...

After a key is pressed, the memo data file structure is displayed on the screen as follows:

Record No.	NNN
PRG	XXX
PRJNO	NNN
PRJDES	memo
JUST	memo
NOTES	memo

To enter information in these fields refer to the instructions in Table 4.3.

TABLE 4.3. Entering Project Description, Justification, and Additional Information

1. Position the cursor on the field in which data is to be entered: PRJDES = Project Description, JUST = Justification, NOTES = Additional Information.

2. Press "Ctrl/PgDn" to enter the memo field. (A blank screen will be provided.)

3. Set the "Caps Lock" to OFF.

4. Type the text. (Note: Do not press "RETURN" at the end of a line and do not use hyphens to divide words at the end of the line. The text automatically wraps around to the next line. The format in which it appears on the screen is not necessarily the format in which it will appear when printed.)

5. Refer to the dBase III User Manual, Page 4-69, for special function keys that are useful in the text editor mode.

6. After the information has been entered, press "Ctrl/End" to exit the memo field.

7. Repeat the preceding steps to enter data in each of the memo fields.

4.3 EDITING DATA

The data edit program (EDIT.PRG) allows the modification of project information that is already stored in the data base. The EDIT program is executed when the second option is selected from the applications menu of the CEDATA program. The EDIT program asks the user to enter the title of the project that is to be edited. The program searches the data base for the title.

If the title is not found, the screen displays:

"TITLE THAT WAS ENTERED NOT FOUND"

Would you like to enter another title? (Y/N):

This indicates that either the title was entered incorrectly, or that the project is not currently in the data base. If the user responds yes (Y) to the preceding question, the title can be re-entered. A no (N) response returns the user to the CEDATA applications menu.

If the title is found, the user is presented with another menu (Figure 4.15) from which he/she can elect to edit all data for the project (Option 11), or to edit a given data set (Options 1 through 10). Selecting Option 11 will cause each of the formatted data screens to be presented sequentially, whereas the other options only display the pertinent data screen(s). The screens display the information that is currently in the data base for the project title that was entered. To make corrections, the new data is simply typed over the existing data, with "INSERT" in the OFF mode.

After a screen is edited, "PgDn" will call up the next formatted screen if Option 11 selected, or the user will be asked whether he/she would like to edit other information for this project. A yes (Y) response returns the user to the menu to select the type of information to be edited. If no (N), the user is then asked if he/she would like to edit data for another project. A yes (Y) response returns the user to the beginning of the EDIT program and asks for the title of the project to edit. A no (N) response returns the user to the applications menu in the CEDATA program.

4.4 PRINTING REPORTS

The report program (REPORT.PRG) currently provides three reporting formats: (1) a project description sheet such as the one used in the Energy Conservation Multi-Year Plan FY87-FY91, (2) a brief project description including only items 1, 2, 3, 5, 6, and 16 from the Conservation Project Data Sheet (Figure 1.1), and (3) an expanded project report of all the numeric and character data in the main data base. A sample of each of these types of reports is included in Appendix B.

When REPORT.PRG is called from the CEDATA program, the first screen displays the report menu (Figure 4.16) and asks the user to specify which of the three types of reports is to be printed. Once the type of report is selected, the next menu provides the option to print reports for: (1) all projects in the data base, (2) all projects in a selected program area, or (3) a single project. If the first option is selected, no further information needs to be entered. The reports will start to print automatically. If the second option is selected, the screen displays a menu of the program areas (as in Figure 4.4) and the user is asked to select one. If option 3 is selected, the screen prompts the user to enter the title of the project to be reported.

The next screen prompts the user to turn on the printer, position the paper to the top of the page, and initialize the printer. This ensures that the printer and the REPORT program both recognize the first line of print as line 1. Failure to initialize the printer may cause printing of a subsequent page to begin in the middle of that page, rather than at the top.

In addition to the main report program (REPORT.PRG), there are three sub-routines (REP1.PRG, REP2.PRG and REP3.PRG) that contain the program instructions for the three customized reports. Whereas REPORT is executed from the CEDATA program, REP1, REP2, and REP3 are automatically executed by the REPORT program as needed. To print information from the memo fields (project

description, justification, or additional information), the following custom report programs are called from REP1, REP2, or REP3:

PRJDES.FRM - project description
JUST.FRM - justification
NOTES.FRM - additional information

4.5 ON-SCREEN SEARCH

The on-screen search program (SEARCH.PRG) is executed when option 4 is selected from the applications menu of the CEDATA program. SEARCH allows the user to search the data base for a given project title, for a combination of keywords, or for a combination of field constraints combined in a Boolean expression. Each of these options is discussed in more detail in the following sections. The search menu displaying the search options is shown in Figure 4.17.

4.5.1 Title Search

The title search program (STITLE.PRG) is called from the SEARCH program when the user selects option 1 from the search menu. The user is first asked to enter the title of the project which is the object of the search. If the title is not found, the user is given the option to enter another title, return to the search menu, or return to the applications menu. If the title is found, a menu is provided which allows the user to elect to display all or selected information for that project on the screen. Project data is displayed on the same formatted screens used in the data entry and data edit programs. After viewing the data, press "PgOn". The user can then elect to: (1) display additional information for the project, (2) search for another project title, (3) return to the search menu, or (4) return to the applications menu.

4.5.2 Keyword Search

The keyword search program (SKEY.PRG) is executed when option 2 is selected from the search menu. A formatted screen is provided in which the user can enter up to six keywords. The keywords are entered along with a keyword code which indicates the type of keyword (i.e., discipline, material, technique, phenomenon, environment, or other). A list of keyword codes is provided on the screen. Keywords may be all of one type or all different types. The program automatically searches the keyword data base (CEKEY.DBF) for projects that list the keyword combination specified by the user. The screen will display the number of projects that list the specified keywords and the percentage of the total number of projects in the data base that this represents.

For the projects that list the specified keywords, the user can elect to: (1) display the titles on the screen, (2) print the titles, or (3) print project description sheets for each of the projects. Alternatively, the user can elect to return to the search menu or the applications menu at this point.

4.5.3 Boolean Search

The Boolean search program (SBOOL.PRG) is executed when option 3 is selected from the search menu. This program allows the user to sort the data base on a combination of up to six field constraints. The following example, which has four field constraints, will be used to illustrate the use of the Boolean search program:

All projects mandated by law that are in the transportation program or the industry program and that will save more than 100 trillion Btu of oil annually.

The first screen in the Boolean search program prompts the user to enter up to six field name/field type/operator/data constraints. The screen is formatted for ease of data entry. The field name is entered first followed by an "N" or a "C" to indicate whether it is a numeric or character field, respectively. A list of the field names that can be used with the Boolean search option is provided in Table 4.4 by field type. Next, the desired relational operator is entered. The equal to (=) and not equal to (#) operators can be used with character or numeric data. The greater than (>), less than (<), greater than or equal to (>=), and less than or equal to (<=) operators can only be used with numeric fields. Finally, the numeric or character data that is the object of the search is entered under the data column. Press "RETURN" to move to the next screen position. When you have entered all the constraints for the search, press "PgDn".

EXAMPLE:

FIELD NAME	TYPE	OP	SEARCH DATA
LAW	C	=	Y
PRG	C	=	TP
PRG	C	=	IP
OIL	N	>	100

The next screen displays the constraints that have been entered. Each of these is assigned a letter, beginning with A. The user is then asked to combine the constraints into a Boolean expression for the search, using the logical operators AND and OR and parentheses as needed for grouping.

EXAMPLE:

```
A:  LAW = 'Y'
B:  PRG = 'TP'
C:  PRG = 'IP'
D:  OIL > 100

USE THE CODES ON THE RIGHT TO          CODE      LOGIC OPERATOR
WRITE A BOOLEAN EXPRESSION
(e.g., (A+8)*(C+D) represents            *            OR
(A and B) or (C and D)                   +            AND

User Types:      A+(B*C)+D

    Program displays the following expression:

    EXPRESSION:  LAW = 'Y'.AND. (PRG='TP'=.OR. PRG='IP').AND. OIL > 100

    Press any key to continue...
```

The program then searches the data base for projects that meet the specified constraints. It sums the number of projects and the FY87 budgets of the projects that meet the constraints and displays this information on the screen along with the percentages of the total number of projects and project

TABLE 4.4. Field Names for Boolean Search Program

FIELD NAME	DESCRIPTION	FIELD LENGTH	DECIMALS
Character Fields:			
PRG	Program	5	
SU8PRG	Subprogram	4	
AREA	Area	4	
DOEPM	DOE Project Manager	25	
CONPM	Contractor's Project Manager	25	
CONORG	Research Organization	40	
CONCITY	Contractor's City	20	
CONSTATE	Contractor's State	2	
CONTYPE	Type of Organization	1	
LAW	Mandated by Law? (Y/N)	1	
PRGSUP	Program Support? (Y/N)	1	
OTHPRJ	Necessary for Completion of Other Project? (Y/N)	1	
PRJCAT	Project Category	1	
PHASE1	Phase at Start of FY87	2	
PHASE2	Phase at Program Completion	2	
MULTI	Multi-Fuel Capability	1	
ALTFUEL	Alternative Fuel Benefits	1	
STOR	Energy Storage Benefit	1	
ELOAD	Electric Load Management Benefit	1	
NE1-NE5	Non-Energy Benefits	2	
FPROF	Funding Profile	1	
Numeric Fields:			
OIL	Annual Oil Savings	6	1
GAS	Annual Gas Savings	6	1
COAL	Annual Coal Savings	6	1
DTHFUEL	Annual Savings Other Fuels	6	1
ELECT1	Annual Electricity Savings	6	1
ELECT2	Annual Electric Losses	7	1
UNSPC	Annual Savings-Unspecified	6	1
NETSAV	Annual Net Energy Savings	8	1
MKTMAX	Maximum Potential Market Penetration	3	
SUNK	DOE Sunk Costs thru FY86	7	3
FY87	DOE FY87 Budgetary Costs	6	3
FY88	DOE FY88 Budgetary Costs	6	3
FY89	DOE FY89 Budgetary Costs	6	3
FY90	DOE FY90 Budgetary Costs	6	3
FY91	DOE FY91 Budgetary Costs	6	3
TOTAL	DOE Cumulative Costs FY87 thru Completion	8	3
PSSUNK	Private Sector Sunk Costs thru FY86	6	3
PSTOT	Private Sector Cumulative Costs thru Completion	8	3

budgets that it represents.

EXAMPLE: 2 PROJECT(S), WITH A CUMULATIVE BUDGET OF $8.100 MEET THE FOLLOWING CRITERIA:

```
LAW = 'Y' .AND.(PRG = 'TP' .OR. PRG = 'IP') .AND. OIL > 100
```

THIS REPRESENTS:

1. 1.40% OF THE 143 CONSERVATION PROJECTS
2. 0.02% OF THE TOTAL BUDGET

Press any key to continue...

For the projects that meet the constraints, the user can elect to: (1) display the titles on the screen, (2) print the titles, or (3) print project description sheets for each of the projects. The user can elect to return to the search menu or the applications menu at this point.

4.6 HELP

The help program (HELP.PRG) is executed when the user selects option 5 from the applications menu in the CEDATA program. In the HELP program, the user is asked to select the application with which he/she would like help. A brief paragraph describing the application is shown on the screen and the appropriate section in the User Manual is indicated.

4.7 EXITING THE APPLICATIONS PROGRAM

The user can exit the applications program by selecting option 6 from the CEDATA applications menu. This option closes all open files and returns the user to the DOS operating system.

At this point, backup copies of the data bases should be made to protect against loss of any new information that has been entered or any alterations that have been made. Backup can be accomplished from the DOS operating system with the following commands:

To backup a single file:

```
COPY d1:filename.DBF d2:filename.DBF
```

To backup all data base files:

```
COPY d1:*.DBF d2:
```

To backup all program files:

```
COPY d1:*.PRG d2:
```

Where d1 = source drive designation and d2 = destination drive designation.

```
**************************************
*   CONSERVATION PROJECT DATA BASE   *
*       OFFICE OF CONSERVATION       *
*     U. S. DEPARTMENT OF ENERGY     *
**************************************
```

This data base contains descriptive information on each of the projects currently being conducted under the Office of Conservation, U.S. Department of Energy.

Refer to the User Manual for directions on how to use the data base.

Press any key to continue...

FIGURE 4.2. Conservation Project Data Base Banner

```
** CONSERVATION PROJECT DATA BASE **

        ************************
        *  APPLICATIONS MENU   *
        ************************

           (1) ENTER DATA

           (2) PRINT REPORT(S)

           (3) EDIT

           (4) ON-SCREEN SEARCH

           (5) HELP

           (6) STOP

        PLEASE SELECT A NUMBER:  0
```

FIGURE 4.3. CEDATA Program Applications Menu

```
**********************************
*   ADD RECORDS TO PROJECT FILE   *
**********************************

 Add information for which program?


(1) BUILDINGS AND COMMUNITY SYSTEMS
(2) TRANSPORTATION
(3) INDUSTRY PROGRAM
(4) ENERGY STORAGE
(5) ELECTRIC ENERGY SYSTEMS
(6) ENERGY CONVERSION AND UTILIZATION
    TECHNOLOGY

      PLEASE SELECT A NUMBER:  0
```

FIGURE 4.4. ADD Program - Program Selection Menu

```
1.  Project Title

2.  Project Identification
    A.  Program:  XXX
    B.  Subprogram:
    C.  Area:
    D.  Key Activity:

3.  DOE Project Manager
    A.  Name:
    B.  Phone:

4.  Contractor's Project Manager
    A.  Name (Last, First, MI)
    B.  Research Organization:
    C.  Street Address:
        City:                          State:      Zipcode:
    D.  Phone:
    E.  Type of Organization:

1 = Private Industry                   5 = State or Local Government
2 = DOE Laboratory                     6 = Combination of the Above
3 = Other Federal Organization         7 = To Be Determined
4 = University
```

FIGURE 4.5. ADD Program - Data-Entry Screen 1

** CONSERVATION PROJECT DATA BASE **

PROJECT TITLE: XXXXX

7. PRDGRAM INTERRELATIONSHIPS

A. Mandated Project (Y/N):

B. Program Support (Y/N):

C. Necessary for Completion of Another Project (Y/N):

If yes, enter title of dependent project:

FIGURE 4.6. ADD Program - Data-Entry Screen 2

PROJECT TITLE: XXXXX

8. PROJECT CATEGORY =

Category Codes:

1 = Technology R&D
2 = Technology Assessment/Feasibility Study
3 = Health Effects and Safety Research
4 = Technical Support for Rule-Making
5 = Program and Policy Planning and Evaluation
6 = Energy and Economic Data Development or Analysis
7 = Mathematical Model Development
8 = Consumer Information on Energy Efficiency (General Public)
9 = Technology Transfer/Research Publications (Technical Community)
10 = Other

FIGURE 4.7. ADD Program - Data-Entry Screen 3

Project Title: XXXXX

9. R&D PHASE

A. Phase at Start of FY 1987: B. Phase at Project Completion:

Phase codes are defined as follows:

1 Generic Research
2a Explore Product/Process Innovation and Concepts
2b Documentation and Theoretical Assessment of System Elements
2c Laboratory Testing and Evaluation of System Elements
3a System Engineering Design and Analysis
3b Detailed Engineering-Scale Design
4a Design Pilot-Scale Prototype
4b Build and Test Pilot-Scale Prototype
4c Evaluate Pilot-Scale Test Results
4d Design Full-Scale Proof-of-Principle Unit
4e Build and Test Full-Scale Proof-of-Principle Unit
4f Evaluate Full-Scale Proof-of-Principle Test Results
5 Demonstration Testing
6 Commercialization, Production and Operation

FIGURE 4.8. ADD Program - Data-Entry Screen 4

10. TECHNICAL KEYWORDS

A. Disciplines
1.
2.
3.

B. Materials
1.
2.
3.

C. Techniques
1.
2.
3.

D. Phenomena
1.
2.
3.

FIGURE 4.9. ADD Program - Data-Entry Screen 5

10. TECHNICAL KEYWORDS (continued)

E. Environment

1.
2.
3.

F. Other

1.
2.
3.

FIGURE 4.10. ADD Program - Data-Entry Screen 6

11. ENERGY SAVINGS

Form	Year 2010 (Trillion Btu/Year)
A. Oil	.
B. Gas	.
C. Coal	.
D. Other	.
E. Electricity at 3412 Btu/kWh saved	.
F. Electrical Losses at 8091 Btu/kWh	.
G. Primary Energy Not Specified by Kind	.
H. Net Savings (sum of the above)	

FIGURE 4.11. ADD Program - Data-Entry Screen 7

12. ASSUMPTIONS FOR ENERGY SAVINGS

A. Per-Unit Annual Savings:
B. Year 2010 Market (Number of Units):
C. Maximum Potential Market Penetration (%):
D. Market Penetration Curve:

Year a:
Year b:
Year c:

13. ACCELERATION PERIOD (number of years):

14. OTHER ENERGY-RELATED BENEFITS

A. Multiple Fuel Capability (Y/N):
B. Alternative Fuel Benefits (Y/N):
C. Energy Storage Benefit (Y/N):
D. Electric Load Management Benefit (Y/N):

FIGURE 4.12. ADD Program - Data-Entry Screen 8

15. NON-ENERGY BENEFITS

Benefits are prioritized on a scale of 0 to 5. A score of 5 indicates a major national benefit and a score of 0 indicates no significant or known effect.

ENTER THE CODE FROM THE LIST ON THE RIGHT FOR UP TO FIVE NON-ENERGY BENEFITS

5 =	TL (Technology Leadership)
	IC (Industrial Competitiveness)
4 =	NS (National Security)
	SR (System Reliability)
3 =	PH (Public Health)
	EQ (Environmental Quality)
2 =	CC (Reduced Consumer Costs)
	EM (Increased Employment)
1 =	

FIGURE 4.13. ADD Program - Data-Entry Screen 9

16. PROJECT COSTS

A. DOE Budgetary Costs

$ Millions

- Sunk through FY 1986: .
- FY 1987: .
- FY 1988: .
- FY 1989: .
- FY 1990: .
- FY 1991: .
- Cumulative FY87 thru Completion: .

B. Private Sector Contributions

- Sunk through FY 1986: .
- Cumulative FY 1987 thru Completion: .

17. FUNDING PROFILE: (Over Planning Horizon)

1 = Decreasing, 2 = Peaking, 3 = Increasing, 4 = Level, 5 = Variable

FIGURE 4.14. ADD Program - Data-Entry Screen 10

SELECT TYPE OF INFORMATION TO EDIT FROM FOLLOWING LIST:

(1) Project Title/Project ID/DOE Contact/Contractor
(2) Program Interrelationships
(3) Project Category
(4) R&D Phase
(5) Technical Keywords
(6) Energy Savings
(7) Energy Savings Assumptions/Acceleration Period/Other Benefits
(8) Non-Energy Benefits
(9) Project Costs
(10) Project Description/Justification
(11) All Information

PLEASE SELECT A NUMBER: 0

FIGURE 4.15. EDIT Program - Information Selection Menu

```
** CONSERVATION PROJECT DATA BASE **

        ********************
        *   REPORT MENU    *
        ********************

    (1)  PRINT STANDARD PROJECT REPORT

    (2)  PRINT BRIEF PROJECT REPORT

    (3)  PRINT EXPANDED PROJECT REPORT

    (4)  RETURN TO MAIN MENU

        PLEASE SELECT A NUMBER:  0
```

FIGURE 4.16. REPORT Program - Report Menu

```
** CONSERVATION PROJECT DATA BASE **

        ********************
        *   SEARCH MENU    *
        ********************

        (1)  TITLE SEARCH

        (2)  KEYWORD SEARCH

        (3)  BOOLEAN SEARCH

        (4)  RETURN TO MAIN MENU

        PLEASE SELECT A NUMBER:  0
```

FIGURE 4.17. SEARCH Program - Search Menu

APPENDIX A: PROGRAM LISTINGS

```
************************CEDATA.PRG*******************************
*******  THIS IS THE MAIN PROGRAM FOR THE CONSERVATION       ***
*******                 PROJECT DATA BASE                    ***
*****************************************************************
SET TALK OFF
SET DEVICE TO SCREEN
CLEAR
@ ROW()+2,15 SAY '****************************************'
@ ROW()+1,15 SAY '*    CONSERVATION PROJECT DATA BASE    *'
@ ROW()+1,15 SAY '*        OFFICE OF CONSERVATION        *'
@ ROW()+1,15 SAY '*       U.S. DEPARTMENT OF ENERGY      *'
@ ROW()+1,15 SAY '****************************************'
@ ROW()+4,10 SAY 'This data base contains descriptive information'
@ ROW()+1,10 SAY 'on each of the projects currently being conducted'
@ ROW()+1,10 SAY 'under the Office of Conservation, U.S. Department'
@ ROW()+1,10 SAY 'of Energy.'
@ ROW()+2,10 SAY 'Refer to the User Manual for directions on how to'
@ ROW()+1,10 SAY 'use the data base.'
@ ROW()+5,10 SAY ' '
WAIT
CLEAR
*****************************************************************
***  THE FOLLOWING PROGRAM STEPS SET UP THE MAIN MENU          ***
*****************************************************************
CLEAR
STORE .T. TO MENU
DO WHILE MENU
CLEAR
@ ROW()+2,15 SAY '**   CONSERVATION PROJECT DATA BASE  **'
@ ROW()+3,20 SAY '**********************'
@ ROW()+1,20 SAY '* APPLICATIONS MENU *'
@ ROW()+1,20 SAY '**********************'
@ ROW()+2,21 SAY '(1)  ENTER DATA'
@ ROW()+2,21 SAY '(2)  PRINT REPORT(S)'
@ ROW()+2,21 SAY '(3)  EDIT'
@ ROW()+2,21 SAY '(4)  ON-SCREEN SEARCH'
@ ROW()+2,21 SAY '(5)  HELP'
@ ROW()+2,21 SAY '(6)  STOP'
STORE 0 TO mMEN
@24,15 SAY 'PLEASE SELECT A NUMBER:' GET mMEN PICTURE '9'
READ
CLEAR
DO CASE
CASE mMEN = 1
DO ADD
CASE mMEN = 2
DO REPORT
CASE mMEN = 3
DO EDIT
CASE mMEN = 4
DO SEARCH
CASE mMEN = 5
DO HELP
CASE mMEN = 6
CLEAR ALL
```

```
CASE mMEN = 7
STORE .F. TO MENU
ENDCASE
ENDDO
RELEASE ALL
RETURN
```

```
*****************************************************************
****                          ADD.PRG                          *****
***** THIS PROGRAM ADDS DATA TO THE PROJECT DATA FILES THROUGH **
*****              CUSTOM FORMATTED SCREENS                    ****
*****************************************************************
SET TALK OFF
SET ESCAPE OFF
SET HEADING OFF
CLEAR
STORE 'Y' TO CONT
DO WHILE CONT = 'Y'
SET DEVICE TO SCREEN
CLEAR
@ 1,21 SAY '**************************'
@ 2,21 SAY 'ADD RECORDS TO PROJECT FILE'
@ 3,21 SAY '**************************'
@ 5,8 SAY 'Add information for which program?'
STORE 0 TO nNM
@ ROW()+3,8 SAY '(1)  BUILDINGS AND COMMUNITY SYSTEMS'
@ ROW()+1,8 SAY '(2)  TRANSPORTATION'
@ ROW()+1,8 SAY '(3)  INDUSTRY PROGRAM'
@ ROW()+1,8 SAY '(4)  ENERGY STORAGE'
@ ROW()+1,8 SAY '(5)  ELECTRIC ENERGY SYSTEMS'
@ ROW()+1,8 SAY '(6)  ENERGY CONVERSION AND UTILIZATION TECHNOLOGY'
@ ROW()+4,5 SAY 'Please Select a Number:'  GET nNM PICTURE '9'
READ
CLEAR
DO CASE
CASE nNM =0
STORE 'N' TO CONT
RETURN
CASE nNM = 1
STORE 'BUILDINGS AND COMMUNITY SYSTEMS' TO mPROG
STORE 'BCS' TO mPRG
CASE nNM = 2
STORE 'TRANSPORTATION' TO mPROG
STORE 'TP' TO mPRG
CASE nNM = 3
STORE 'INDUSTRY PROGRAM' TO mPROG
STORE 'IP' TO mPRG
CASE nNM = 4
STORE 'ENERGY STORAGE' TO mPROG
STORE 'ES' TO mPRG
CASE nNM = 5
STORE 'ELECTRIC ENERGY SYSTEMS' TO mPROG
STORE 'EES' TO mPRG
CASE nNM = 6
STORE 'ENERGY CONVERSION AND UTILIZATION TECHNOLOGY' TO mPROG
STORE 'ECUT' TO mPRG
CASE nNM = 7
RETURN
ENDCASE
USE CEMEM
APPEND BLANK
USE CEKEY
```

```
APPEND BLANK
USE CEGEN
APPEND BLANK
GO BOTTOM
STORE RECNO() TO RN
REPLACE PRJNO WITH RN
REPLACE PRG WITH mPRG
SET FORMAT TO GEN1
EDIT RN
STORE TITLE TO mTITLE
WAIT
SET FORMAT TO GEN2
EDIT RN
WAIT
SET FORMAT TO GEN3
EDIT RN
WAIT
SET FORMAT TO GEN4
EDIT RN
WAIT
GO BOTTOM
CLEAR
USE CEKEY
GOTO RN
REPLACE PRJNO WITH RN
SET FORMAT TO GEN5
EDIT RN
WAIT
SET FORMAT TO GEN6
EDIT RN
WAIT
GO BOTTOM
CLEAR
USE CEGEN
GOTO RN
SET FORMAT TO BEN1
EDIT RN
GOTO RN
mNETSAV = (OIL + GAS + COAL + OTHFUEL + ELECT1 + ELECT2 + UNSPC)
REPLACE NETSAV WITH mNETSAV
@ 16,48 SAY NETSAV
@ 18,5 SAY ' '
WAIT
SET FORMAT TO BEN2
EDIT RN
WAIT
SET FORMAT TO BEN3
EDIT RN
WAIT
SET FORMAT TO COS1
EDIT RN
WAIT
GOTO RN
mCOS = FY87 + FY88 + FY89 + FY90 + FY91
IF TOTAL < mCOS
```

```
CLEAR
@ 2,5 SAY 'ERROR:  Cummulative cost from FY87 to completion;
 is less than'
@ 3,5 SAY '        the sum of the FY87 through FY91 costs'
@ 6,10 SAY 'TO CORRECT THIS INFORMATION ON THE NEXT SCREEN,'
@ 7,10 SAY 'SIMPLY TYPE OVER THE CURRENT DATA'
@ 10,10 SAY ' '
WAIT
SET FORMAT TO COS1
GOTO RN
READ
REPLACE FY87 WITH FY87, FY88 WITH FY88, FY89 WITH FY89,;
 FY90 WITH FY90
REPLACE FY91 WITH FY91, TOTAL WITH TOTAL
CLOSE FORMAT
ENDIF
GO BOTTOM
USE
CLOSE FORMAT
USE
CLEAR
@ 2,5 SAY 'To add Project Description, Justification or Notes'
@ 3,5 SAY 'refer to Section 4.2.2 of the User Manual'
@ 5,5 SAY ' '
WAIT
USE CEMEM
GOTO RN
REPLACE PRJNO WITH RN
EDIT RN
GO BOTTOM
CLEAR
STORE ' ' TO nNUM
@ 15,5 SAY 'Do you want to add another project to the data;
 base [Y/N?]'GET nNUM PICTURE 'X'
READ
DO WHILE UPPER(nNUM) # 'Y' .AND. UPPER(nNUM) # 'N'
CLEAR
@ 10,5 SAY 'ILLEGAL RESPONSE, TRY AGAIN'
STORE ' ' TO nNUM
@ 15,5 SAY 'Do you want to add another project to the;
 data base [Y/N]?' GET nNUM PICTURE 'X'
READ
ENDDO
IF nNUM = 'N'
ERASE CET.NDX
USE CEGEN
INDEX ON TITLE TO CET
ENDIF 'N'
STORE nNUM TO CONT
@ 20,1 SAY ' '
ENDDO
SET ESCAPE ON
RELEASE ALL
CLEAR ALL
CLOSE FORMAT
```

RETURN

```
***                              EDIT.PRG                                ******
*** PROGRAM ALLOWS DATA TO BE EDITTED IN THE SELECTED FILE *******
*************************************************************************
CLEAR ALL
SET TALK OFF
CLEAR
STORE .T. TO ED
DO WHILE ED
   CLEAR
   STORE '                                                          ;
                  ' to mTITLE
   @ 7,15 SAY '     ENTER TITLE OF PROJECT TO EDIT:  '
   @ 9,10 GET mTITLE
   READ
   USE CEGEN INDEX CET
DO WHILE .NOT. EOF()
   LOCATE FOR TITLE = UPPER(mTITLE)
   IF EOF()
   CLEAR
   @ 2,5 SAY 'TITLE NOT FOUND'
   STORE 'Y' TO ANS
   @ 3,5 SAY 'Would you like to enter another title?;
 [Y/N]: ' GET ANS
   READ
   IF UPPER(ANS) = 'Y'
   LOOP
   ELSE
   STORE .F. TO ED
   STORE .T. TO MENU
   RETURN
   ENDIF ANS
   ENDIF EOF
   STORE RECNO() TO R
   CLEAR
   @ ROW()+1,5 SAY 'TO EDIT ANY OF THE DATA ITEMS SIMPLY TYPE OVER;
 THE'
   @ ROW()+1,5 SAY 'EXISTING INFORMATION. PRESS <RETURN> TO MOVE TO;
 THE NEXT'
   @ ROW()+1,5 SAY 'ITEM.  AFTER CHANGES ARE MADE, PRESS <PgDn>.'
   @ ROW()+5,5 SAY ' '
   WAIT
   STORE .T. TO TYPE
DO WHILE TYPE
   CLEAR
   STORE 0 TO TYP
   @ 1,15 SAY 'SELECT TYPE OF INFORMATION TO EDIT FROM FOLLOWING;
 LIST:'
   @ 3,5 SAY '(1) Project Title/Project ID/DOE Contact;
/Contractor'
   @ 4,5 SAY '(2) Program Interrelationships'
   @ 5,5 SAY '(3) Project Category'
   @ 6,5 SAY '(4) R&D Phase'
   @ 7,5 SAY '(5) Technical Keywords'
   @ 8,5 SAY '(6) Energy Savings'
   @ 9,5 SAY '(7) Energy Savings Assumptions/Acceleration;
```

```
 Period/Other Benefits'
   @ 10,5 SAY '(8) Non-Energy Benefits'
   @ 11,5 say '(9) Project Costs'
   @ 12,4 SAY '(10) Project Description/Justification'
   @ 13,4 SAY '(11) All Information'
   @ 15,15 SAY 'PLEASE SELECT A NUMBER: ' GET TYP PICTURE '99'
   READ
   IF TYP = 1 .OR. TYP = 11
USE CEGEN
GOTO R
   SET FORMAT TO GEN1
   READ
   REPLACE PRG WITH PRG, SUBPRG WITH SUBPRG, AREA WITH AREA,;
   KEYACT WITH KEYACT
   REPLACE TITLE WITH TITLE, DOEPM WITH DOEPM, DOEPH WITH DOEPH
   REPLACE CONPM WITH CONPM, CONORG WITH CONORG, CONSTR WITH CONSTR
   REPLACE CONCITY WITH CONCITY, CONSTATE WITH CONSTATE,;
   CONZIP WITH CONZIP
   REPLACE CONTYPE WITH CONTYPE
   CLOSE FORMAT
   USE
ENDIF 1 OR 11
IF TYP = 2 .OR. TYP = 11
   USE CEGEN
   GOTO R
SET FORMAT TO GEN2
   READ
   REPLACE LAW WITH LAW, PRJSUP WITH PRJSUP, OTHPRJ WITH OTHPRJ
   REPLACE OTHNAM WITH OTHNAM
CLOSE FORMAT
USE
   ENDIF 2 OR 11
   IF TYP = 3 .OR. TYP = 11
   USE CEGEN
   GOTO R
SET FORMAT TO GEN3
   READ
   REPLACE PRJCAT WITH PRJCAT
CLOSE FORMAT
USE
   ENDIF 3 OR 11
   IF TYP = 4 .OR. TYP =11
   USE CEGEN
GOTO R
SET FORMAT TO GEN4
   READ
   REPLACE PHASE1 WITH PHASE1, PHASE2 WITH PHASE2
CLOSE FORMAT
USE
   ENDIF 4 OR 11
   IF TYP = 5 .OR. TYP = 11
   USE CEKEY
LOCATE FOR PRJNO = R
SET FORMAT TO GEN5
   READ
```

```
   REPLACE DIS1 WITH DIS1, DIS2 WITH DIS2, DIS3 WITH DIS3,;
   MAT1 WITH MAT1
   REPLACE MAT2 WITH MAT2, MAT3 WITH MAT3, TQ1 WITH TQ1, TQ2;
   WITH TQ2
   REPLACE TQ3 WITH TQ3, PH1 WITH PH1, PH2 WITH PH2, PH3 WITH PH3
   SET FORMAT TO GEN6
   READ
   REPLACE EN1 WITH EN1, EN2 WITH EN2, EN3 WITH EN3, OT1 WITH OT1,;
   OT2 WITH OT2
   REPLACE OT3 WITH OT3
CLOSE FORMAT
USE
   ENDIF 5 OR 11
   IF TYP = 6 .OR. TYP = 11
   USE CEGEN
   GOTO R
   SET FORMAT TO BEN1
   READ
   REPLACE OIL WITH OIL, GAS WITH GAS, COAL WITH COAL, OTHFUEL;
   WITH OTHFUEL
   REPLACE ELECT1 WITH ELECT1, ELECT2 WITH ELECT2, UNSPC WITH UNSPC
   GOTO R
   mNETSAV = (OIL + GAS + COAL + OTHFUEL + ELECT1 + ELECT2 + UNSPC)
   REPLACE NETSAV WITH mNETSAV
   @ 16,48 SAY NETSAV
   WAIT
CLOSE FORMAT
USE
   ENDIF 6 OR 11
   IF TYP = 7 .OR. TYP = 11
   USE CEGEN
   GOTO R
SET FORMAT TO BEN2
   READ
   REPLACE ANNSAV WITH ANNSAV, UNITS WITH UNITS, MKTMAX WITH MKTMAX
   REPLACE MKTY1 WITH MKTY1, MKTY2 WITH MKTY2, MKTY3 WITH MKTY3,;
   ACCY WITH ACCY
   REPLACE MULTI WITH MULTI, ALTFUEL WITH ALTFUEL, STOR WITH STOR,;
   ELOAD WITH ELOAD
CLOSE FORMAT
USE
   ENDIF 7 OR 11
   IF TYP = 8 .OR. TYP = 11
   USE CEGEN
   GOTO R
SET FORMAT TO BEN3
   READ
REPLACE NE1 WITH NE1, NE2 WITH NE2, NE3 WITH NE3, NE4 WITH NE4
REPLACE NE5 WITH NE5
CLOSE FORMAT
USE
   ENDIF 8 OR 11
   IF TYP = 9 .OR. TYP = 11
   USE CEGEN
   GOTO R
```

```
   SET FORMAT TO COS1
   READ
   REPLACE SUNK WITH SUNK, FY87 WITH FY87, FY88 WITH FY88,;
 FY89 WITH FY89
   REPLACE FY90 WITH FY90, FY91 WITH FY91, TOTAL WITH TOTAL,;
 PSSUNK WITH PSSUNK
   REPLACE PSTOT WITH PSTOT, FPROF WITH FPROF
   CLEAR
CLOSE FORMAT
USE
   ENDIF 9 OR 11
   IF TYP = 10 .OR. TYP = 11
   CLEAR
   @ 3,5 SAY 'To edit the project description or the;
   justification,'
   @ 4,5 SAY 'refer to Section 4.3 of the User Manual for;
   instructions'
   WAIT
   USE CEMEM
LOCATE FOR PRJNO = R
   CHANGE FIELDS PRJDES, JUST, NOTES FOR RECNO() =R
   CLEAR
USE
   ENDIF 10 OR 11
   CLEAR
   STORE 'Y' TO AN
   @ 3,5 SAY 'DO YOU WANT TO EDIT OTHER INFORMATION FOR;
   THIS PROJECT? [Y/N]: ' GET AN
   READ
   IF AN = 'N'
   STORE .F. TO TYPE
   ENDIF
ENDDO TYPE
   STORE 'Y' TO eNUM
   @ 6,5 SAY 'DO YOU WANT TO EDIT DATA FOR ANOTHER;
   PROJECT? [Y/N]:' GET eNUM PICTURE 'X'
   READ
DO WHILE UPPER(eNUM) # 'Y' .AND. UPPER(eNUM) # 'N'
   CLEAR
   @ 3,5 SAY 'ILLEGAL RESPONSE, TRY AGAIN'
   STORE 'Y' TO eNUM
   CLEAR
   @ 5,5 SAY 'DO YOU WANT TO EDIT DATA FOR ANOTHER PROJECT?;
   [Y/N]:'
   GET eNUM PICTURE 'X'
   READ
ENDDO # UPPER Y/N
   IF eNUM = 'N'
   ERASE CET.NDX
USE CEGEN
INDEX ON TITLE TO CET
   STORE .F. TO TYPE
   GO BOTTOM
   SKIP
   STORE .F. TO ED
```

```
ELSE
   STORE .F. TO TYPE
STORE .T. TO ED
EXIT
   ENDIF
   @ 15,5 SAY ' '
ENDDO
ENDDO
RELEASE ALL
CLEAR ALL
RETURN
```

```
**********REPORT.PRG**********
***   THIS PROGRAM DISPLAYS THE REPORT MENU ON SCREEN AND   *****
***   ALLOWS VARIOUS REPORTING OPTIONS                      *****
*****************************************************************
SET TALK OFF
SET DEVICE TO SCREEN
CLEAR
@2,15 SAY '**  CONSERVATION PROJECT DATA BASE **'
@4,27 SAY '***************'
@5,27 SAY '* REPORT MENU *'
@6,27 SAY '***************'
@8,22 SAY '(1)  PRINT STANDARD PROJECT REPORT'
@10,22 SAY '(2)  PRINT BRIEF PROJECT REPORT'
@12,22 SAY '(3)  PRINT EXPANDED PROJECT REPORT'
@14,22 SAY '(4)  RETURN TO MAIN MENU'
STORE 0 TO RM
@20,22 SAY 'PLEASE SELECT A NUMBER:'  GET RM PICTURE '9'
READ
CLEAR
@ ROW()+2,5 SAY 'TURN ON PRINTER, SET PAPER AT TOP OF PAGE, AND'
@ ROW()+1,5 SAY 'PRESS "TOF" BUTTON ON PRINTER'
@ ROW()+5,5 SAY ' '
WAIT
   DO CASE
*** PRINT REPORT #1: MULTI-YEAR PLAN PROJECT DESCRIPTION SHEETS
   CASE RM = 1
   STORE 'REP1' TO REP
*** PRINT REPORT #2: BRIEF DESCRIPTION SHEETS
   CASE RM = 2
   STORE 'REP2' TO REP
*** PRINT REPORT #3: EXANDED DESCRIPTION SHEETS
   CASE RM=3
    STORE 'REP3' TO REP
   CASE RM = 4
   RETURN
   ENDCASE
CLEAR
SET DEVICE TO SCREEN
STORE 0 TO OP
@ ROW()+1,5 SAY 'PRINT PROJECT DESCRIPTION SHEETS'
@ ROW()+2,15 SAY 'Select an Option:'
@ ROW()+3,5 SAY '(1) ALL PROJECTS'
@ ROW()+2,5 SAY '(2) SELECT A PROGRAM OFFICE'
@ ROW()+2,5 SAY '(3) SELECT A PROJECT'
@ ROW()+5,25 GET OP PICTURE '9'
READ
DO CASE
CASE OP = 1
SELECT 1
  USE CEGEN
COUNT TO TT
  DO WHILE .NOT. EOF()
STORE RECNO() TO R
IF R>TT
RETURN
```

```
ENDIF
  DO &REP
SKIP
  ENDDO
CASE OP = 2
CLEAR
STORE 0 TO NO
@ ROW()+5,8 SAY '(1) BUILDINGS AND COMMUNITY SYSTEMS'
@ ROW()+1,8 SAY '(2) TRANSPORTATION'
@ ROW()+1,8 SAY '(3) INDUSTRY PROGRAM'
@ ROW()+1,8 SAY '(4) ENERGY STORAGE'
@ ROW()+1,8 SAY '(5) ELECTRIC ENERGY SYSTEMS'
@ ROW()+1,8 SAY '(6) ENERGY CONVERSION AND UTILIZATION TECHNOLOGY'
@ ROW()+1,8 SAY '(7) RETURN TO REPORT MENU'
@ ROW()+1,8 SAY '(8) RETURN TO MAIN MENU'
@ ROW()+1,9 SAY '(9)'
@ ROW()+4,5 SAY 'Please Select a Program: ' GET NO PICTURE '9'
READ
CLEAR
DO CASE
CASE NO = 1
STORE 'BCS' TO nPRG
CASE NO = 2
STORE 'TP' TO nPRG
CASE NO = 3
STORE 'IP' TO nPRG
CASE NO = 4
STORE 'ES' TO nPRG
CASE NO = 5
STORE 'EES' TO nPRG
CASE NO = 6
STORE 'ECUT' TO nPRG
CASE NO = 7
RETURN
CASE NO = 8
RETURN
CASE NO = 9
STORE 'BB' TO nPRG
ENDCASE
SELECT 1
USE CEGEN
COUNT TO XTOT
STORE XTOT TO TT
GO TOP
STORE 1 TO R
DO WHILE R<=XTOT
IF R>XTOT
RETURN
ENDIF
GOTO R
LOCATE NEXT TT FOR PRG = nPRG
STORE RECNO() TO R
DO &REP
STORE 1+R TO R
ENDDO
```

```
*
CASE OP = 3
SELECT 1
USE CEGEN
COUNT TO TT
CLEAR
STORE '                                                                ;
      ' TO mTITLE
@ 3,5 SAY 'PRINT PROJECT DESCRIPTION SHEET FOR WHICH PROJECT?:'
@ 5,5 SAY 'ENTER PROJECT TITLE:'
@ 8,1 GET mTITLE PICTURE '!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!;
!!!!!!!!!!!!!!!!!!!!!!!!'
READ
LOCATE FOR TITLE = UPPER(mTITLE)
STORE RECNO() TO R
IF R>TT
RETURN
ENDIF
DO &REP
ENDDO
ENDCASE
SET DEVICE TO SCREEN
USE
CLEAR ALL
RETURN
```

```
**************************REP1.PRG**************************
*******PRINTS STANDARD REPORT #1 - ALL INFORMATION EXCEPT **
*******CONTRACTOR INFORMATION, KEYWORDS, AND ASSUMPTIONS****
SET TALK OFF
CLEAR
STORE TRIM(TITLE) TO LL
STORE LEN(LL) TO LG
STORE TITLE TO mTITLE
STORE PHASE1 TO RD1
STORE PHASE2 TO RD2
STORE PRG TO mPRG
STORE SUBPRG TO mSUBPRG
STORE AREA TO mAREA
STORE VAL(PRJCAT) TO mPRJCAT
STORE SUBSTR(DOEPH,1,3) TO P1
STORE SUBSTR(DOEPH,4,9) TO P2
STORE DOEPH TO mDOEPH
STORE DOEPM TO mDOEPM
USE PRCODE
LOCATE FOR PRG = mPRG
STORE PRCODE TO PR
USE SPCODE
LOCATE FOR SUBPRG = mSUBPRG
STORE SUBCODE TO SP
USE ARCODE
LOCATE FOR AREA = mAREA
STORE ACODE TO AR
USE PJCODE
LOCATE FOR VAL(PRJCAT) = mPRJCAT
STORE PJCODE TO PJ
USE RDCODE
LOCATE FOR PHCODE = RD1
STORE PHRD TO RD1
LOCATE FOR PHCODE = RD2
STORE PHRD TO RD2
SET DEVICE TO PRINT
IF mPRG='IP' .OR. mPRG ='TP' .OR. mPRG = 'ES'
@ PROW(),75 SAY PR
ENDIF
IF mPRG='BCS'
@PROW(),75 SAY SUBSTR(PR,1,14)
@PROW()+1,75 SAY SUBSTR(PR,15,31)
ENDIF
IF mPRG='ECUT'
@PROW(),75 SAY SUBSTR(PR,1,18)
@PROW()+1,75 SAY SUBSTR(PR,19,33)
ENDIF
IF mPRG='EES'
@PROW(),75 SAY SUBSTR(PR,1,16)
@PROW()+1,75 SAY SUBSTR(PR,17,23)
ENDIF
LG = LG/2
L = 47 - LG
@ PROW()+3,L SAY UPPER(mTITLE)
@ PROW()+3,10 SAY 'Subprogram:    ' + UPPER(SP)
```

```
@ PROW()+2,10 SAY 'Area:    ' + UPPER(AR)
USE CEGEN
GOTO R
IF KEYACT # ' '
@ PROW()+2,10 SAY 'Key Activity:    ' + UPPER(KEYACT)
@ PROW()+2,10 SAY 'Project Category:    ' + UPPER(PJ)
ELSE
@ PROW()+2,10 SAY 'Project Category:    ' + UPPER(PJ)
ENDIF
*
@ PROW()+2,10 SAY 'DOE Project Manager:    ' + mDOEPM
@ PROW(),PCOL()+3 SAY '(' + P1 + ')' + P2
*
USE CEMEM
GOTO R
REPORT FORM PRJDES FOR RECNO() = R PLAIN NOEJECT TO PRINT
IF PROW() > 50
EJECT
ENDIF
REPORT FORM JUST FOR RECNO() = R PLAIN NOEJECT TO PRINT
IF PROW() > 55
EJECT
ENDIF
USE CEGEN
GOTO R
IF LAW = 'Y' .OR. PRJSUP = 'Y' .OR. OTHPRJ = 'Y'
@ PROW()+2,10 SAY 'Program Interrelationships: '
@ PROW()+1,10 SAY ' '
ENDIF
IF LAW = 'Y'
@ PROW()+1,13 SAY 'This project is mandated by law.'
ENDIF
IF PRJSUP = 'Y'
@ PROW()+1,13 SAY 'This project is required to provide;
 essential services in support of other projects.'
ENDIF
IF OTHPRJ = 'Y'
@ PROW()+1,13 SAY 'The following project(s) is dependent;
 on this project:'
@ PROW()+2,16 SAY OTHNAM
ENDIF
IF PROW() > 50
EJECT
WAIT
ENDIF
IF VAL(PRJCAT)='1'
@ PROW()+2,10 SAY 'R&D Phase:'
@ PROW()+2,13 SAY '1) At Start of FY87:'
@ PROW()+1,16 SAY RD1
@ PROW()+1,13 SAY '2) At Program Completion:'
@ PROW()+1,16 SAY RD2
ENDIF
IF PROW() > 45
EJECT
WAIT
```

```
ENDIF
@ PROW()+3,10 SAY 'Energy Savings Benefits:'
@ PROW()+1,20 SAY '                                                Year 2010'
@ PROW()+1,20 SAY 'Form'
@ PROW(),48 SAY '   (trillion Btu/year)'
@ PROW(),20 SAY '_____________________________________________________'
@ PROW()+1,10 SAY ' '
IF OIL # 0
@ PROW()+1,20 SAY 'Oil'
@ PROW(),58 SAY OIL
ENDIF
IF GAS # 0
@ PROW()+1,20 SAY 'Gas'
@ PROW(),58 SAY GAS
ENDIF
IF COAL # 0
@ PROW()+1,20 SAY 'Coal'
@ PROW(),58 SAY COAL
ENDIF
IF OTHFUEL # 0
@ PROW()+1,20 SAY 'Other'
@ PROW(),58 SAY OTHFUEL
ENDIF
IF ELECT1 # 0
@ PROW()+1,20 SAY 'Electricity @ 3412 Btu/kWh saved'
@ PROW(),58 SAY ELECT1
ENDIF
IF ELECT2 # 0
@ PROW()+1,20 SAY 'Electrical Losses @ 8091 Btu/kWh'
@ PROW(),58 SAY ELECT2
ENDIF
IF UNSPC # 0
@ PROW()+1,20 SAY 'Primary Energy Not Specified by Kind '
@ PROW(),58 SAY UNSPC
ENDIF
@ PROW()+1,10 SAY ' '
@ PROW(),20 SAY '_____________________________________________'
@ PROW()+1,20 SAY 'Net Savings (sum of the above)       '
@ PROW(),56 SAY NETSAV
@ PROW()+1, 5 SAY ' '
IF PROW() > 50
EJECT
WAIT
ENDIF
IF MULTI = 'Y' .OR. ALTFUEL = 'Y' .OR. STOR = 'Y' .OR. ELOAD = 'Y'
@ PROW()+2,10 SAY 'Other Energy-Related Benefits:'
@ PROW()+1,5 SAY ' '
ENDIF
IF MULTI = 'Y'
@ PROW()+1,13 SAY 'o  This technology has multi-fuel capability.'
ENDIF
IF ALTFUEL = 'Y'
@ PROW()+1,13 SAY 'o  This technology uses an alternative;
 fuel to that predominantly'
@ PROW()+1,16 SAY 'used by a conventional technology.'
```

```
ENDIF
IF STOR = 'Y'
@ PROW()+1,13 SAY 'o  This technology is designed to store energy.'
ENDIF
IF ELOAD = 'Y'
@ PROW()+1,13 SAY 'o  This technology can be used manage electric;
 loads by'
@ PROW()+1,16 SAY 'shedding peak electricity demand.'
ENDIF
IF PROW() > 50
EJECT
WAIT
ENDIF
IF NE1 # ' '.OR. NE2 # ' ' .OR. NE3 # ' '.OR. NE4 # ' ' .OR. NE5 # ' '
@ PROW()+3,10 SAY 'Non-Energy Benefits (In order of importance):'
STORE NE1 TO N1
STORE NE2 TO N2
STORE NE3 TO N3
STORE NE4 TO N4
STORE NE5 TO N5
TL = 'Technology Leadership'
IC = 'Industrial Competitiveness'
NS = 'National Security'
SR = 'System Reliability'
PH = 'Public Health'
EQ = 'Environmental Quality'
CC = 'Reduced Consumer Costs'
EM = 'Increased Employment'
IF NE1 #  ' '
@ PROW()+2,15 SAY '1.  '+ &N1
ENDIF
IF NE2 # ' '
@ PROW()+1,15 SAY '2.  '+ &N2
ENDIF
IF NE3 # ' '
@ PROW()+1,15 SAY '3.  '+ &N3
ENDIF
IF NE4 # ' '
@ PROW()+1,15 SAY '4.  '+ &N4
ENDIF
IF NE5 # ' '
@ PROW()+1,15 SAY '5.  '+ &N5
ENDIF
ENDIF
IF PROW() > 50
EJECT
ENDIF
@ PROW()+3,10 SAY 'Project Costs:'
@ PROW()+2,15 SAY 'DOE Budgetary Costs                    ;
 $ millions'
@ PROW(),15 SAY '________________________________________;
_________'
@ PROW()+1,20 SAY 'Sunk through FY 86 . . . . . . . . . .'
@ PROW(),58 SAY SUNK
@ PROW()+1,20 SAY 'FY 87  . . . . . . . . . . . . . . . .'
```

```
@ PROW(),58 SAY FY87
@ PROW()+1,20 SAY 'FY 88  . . . . . .'
@ PROW(),58 SAY FY88
@ PROW()+1,20 SAY 'FY 89  . . . . . .'
@ PROW(),58 SAY FY89
@ PROW()+1,20 SAY 'FY 90  . . . . . .'
@ PROW(),58 SAY FY90
@ PROW()+1,20 SAY 'FY 91  . . . . . .'
@ PROW(),58 SAY FY91
@ PROW()+1,20 SAY 'Cumulative FY 87 through Completion. .'
@ PROW(),58 SAY TOTAL
@ PROW()+2,15 SAY 'Private Sector Contributions          ;
 $ millions'
@ PROW(),15 SAY '_____________________________________________;
_____'
@ PROW()+1,20 SAY 'Sunk through FY 86 . . . . . .'
@ PROW(),58 SAY PSSUNK
@ PROW()+1,20 SAY 'Cumulative FY 87 through Completion. .'
@ PROW(),56 SAY PSTOT
@ PROW()+1,5 SAY ' '
EJECT
WAIT
RELEASE ALL EXCEPT R
RETURN
```

```
**********************************REP2.PRG**********************************
***              PRINTS BRIEF PROJECT DESCRIPTION SHEETS                  ***
****************************************************************************
SET TALK OFF
CLEAR
USE CEGEN
GOTO R
STORE PRG TO pNUM
STORE AREA TO aNUM
STORE SUBPRG TO sNUM
USE PRCODE
LOCATE FOR PRG = pNUM
STORE PRCODE TO pCODE
USE SPCODE
LOCATE FOR SUBPRG = sNUM
STORE SUBCODE TO sCODE
USE ARCODE
LOCATE FOR AREA = aNUM
STORE ACODE TO aCODE
USE CEGEN
LOCATE FOR PRJNO = R
SET DEVICE TO PRINT
@ 2,25 SAY 'CONSERVATION MULTI-YEAR PROGRAM PLAN'
@ 5,10 SAY 'Program Office:'
@ 5,27 SAY pCODE
@ 7,10 SAY 'Subprogram:'
@ 7,27 SAY sCODE
@ 9,10 SAY 'Area:'
@ 9,27 SAY aCODE
@ 11,10 SAY 'Project Title:'
@ 11,27 SAY TITLE PICTURE '!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!;
!!!!!!!!!!!!!!!!!!!!!!!'
USE CEMEM
LOCATE FOR PRJNO = R
REPORT FORM PRJDES FOR RECNO() = R PLAIN NOEJECT TO PRINT
REPORT FORM JUST FOR RECNO() = R PLAIN NOEJECT TO PRINT
USE CEGEN
LOCATE FOR PRJNO = R
@ PROW()+2,10 SAY 'Costs:'
@ PROW()+2,15 SAY 'Federal ($ Million): Cost to complete project;
 is $'
@ PROW(),65 SAY TOTAL PICTURE '999.999'
@ PROW(),73 SAY 'million'
@ PROW()+2,15 SAY 'PRE-'
@ PROW()+1,15 SAY 'FY 1987    FY 1987    FY 1988    FY 1989    ;
 FY 1990  FY 1991'
@ PROW()+1,15 SAY 'Total'
@ PROW()+1,15 SAY '_______    _______    _______    _______    ;
 _______,
 _______'
@ PROW()+1,15 SAY SUNK PICTURE '999.999'
@ PROW(),26 SAY FY87 PICTURE '999.999'
@ PROW(),37 SAY FY88 PICTURE '999.999'
@ PROW(),48 SAY FY89 PICTURE '999.999'
@ PROW(),59 SAY FY90 PICTURE '999.999'
```

```
@ PROW(),70 SAY FY91 PICTURE '999.999'
@ PROW()+3,10 SAY 'H.Q. Point of Contact:'
@ PROW(),35 SAY DOEPM PICTURE 'XXXXXXXXXXXXXXXXXXXXXXXXX'
@ PROW()+2,10 SAY 'Telephone Number:'
STORE SUBSTR(DOEPH,1,3) TO P1
STORE SUBSTR(DOEPH,4,9) TO P2
@ PROW(),35 SAY '(' + P1 + ')' + P2
@ PROW()+1,1 SAY ' '
EJECT
RETURN
```

```
**************************REP3.PRG*****************************
*******PRINTS STANDARD REPORT #3 - ALL INFORMATION *********
SET TALK OFF
CLEAR
STORE TRIM(TITLE) TO LL
STORE LEN(LL) TO LG
STORE TITLE TO mTITLE
STORE PHASE1 TO RD1
STORE PHASE2 TO RD2
STORE PRG TO mPRG
STORE SUBPRG TO mSUBPRG
STORE AREA TO mAREA
STORE VAL(PRJCAT) TO mPRJCAT
STORE SUBSTR(DOEPH,1,3) TO P1
STORE SUBSTR(DOEPH,4,9) TO P2
STORE SUBSTR(CONPH,1,3) TO C1
STORE SUBSTR(CONPH,4,9) TO C2
STORE DOEPH TO mDOEPH
STORE DOEPM TO mDOEPM
USE PRCODE
LOCATE FOR PRG = mPRG
STORE PRCODE TO PR
USE SPCODE
LOCATE FOR SUBPRG = mSUBPRG
STORE SUBCODE TO SP
USE ARCODE
LOCATE FOR AREA = mAREA
STORE ACODE TO AR
USE PJCODE
LOCATE FOR VAL(PRJCAT) = mPRJCAT
STORE PJCODE TO PJ
USE RDCODE
LOCATE FOR PHCODE = RD1
STORE PHRD TO RD1
LOCATE FOR PHCODE = RD2
STORE PHRD TO RD2
SET DEVICE TO PRINT
IF mPRG='IP' .OR. mPRG ='TP' .OR. mPRG = 'ES'
@ PROW(),80 SAY PR
ENDIF
IF mPRG='BCS'
@PROW(),80 SAY SUBSTR(PR,1,14)
@PROW()+1,80 SAY SUBSTR(PR,15,31)
ENDIF
IF mPRG='ECUT'
@PROW(),75 SAY SUBSTR(PR,1,22)
@PROW()+1,75 SAY SUBSTR(PR,23,44)
ENDIF
IF mPRG='EES'
@PROW(),80 SAY SUBSTR(PR,1,16)
@PROW()+1,80 SAY SUBSTR(PR,17,23)
ENDIF
LG = LG/2
L = 47 - LG
@ PROW()+3,L SAY UPPER(mTITLE)
```

```
@ PROW()+3,L SAY UPPER(mTITLE)
@ PROW()+3,10 SAY 'Subprogram:    ' + UPPER(SP)
@ PROW()+2,10 SAY 'Area:    ' + UPPER(AR)
USE CEGEN
GOTO R
IF KEYACT # ' '
@ PROW()+2,10 SAY 'Key Activity:    ' + UPPER(KEYACT)
@ PROW()+2,10 SAY 'Project Category:    ' + UPPER(PJ)
ELSE
@ PROW()+2,10 SAY 'Project Category:    ' + UPPER(PJ)
ENDIF
*
@ PROW()+2,10 SAY 'DOE Project Manager:    ' + mDOEPM
@ PROW(),PCOL()+3 SAY '(' + P1 + ')' + P2
*
@ PROW()+2,10 SAY 'Contractor°s Project Manager:    ' + CONPM
@ PROW()+1,42 SAY CONORG
@ PROW()+1,42 SAY CONSTR
@ PROW()+1,42 SAY TRIM(CONCITY)+','+CONSTATE+'  '+CONZIP
@ PROW()+1,42 SAY '('+C1+')'+C2
@ PROW()+1,10 SAY 'Type of Organization:    '+CONTYPE
USE CEMEM
GOTO R
REPORT FORM PRJDES FOR RECNO() = R PLAIN NOEJECT TO PRINT
IF PROW() > 45
EJECT
ENDIF
REPORT FORM JUST FOR RECNO() = R PLAIN NOEJECT TO PRINT
IF PROW() > 55
EJECT
ENDIF
USE CEGEN
GOTO R
IF LAW = 'Y' .OR. PRJSUP = 'Y' .OR. OTHPRJ = 'Y'
@ PROW()+2,10 SAY 'Program Interrelationships: '
@ PROW()+1,10 SAY ' '
ENDIF
IF LAW = 'Y'
@ PROW()+1,13 SAY 'This project is mandated by law.'
ENDIF
IF PRJSUP = 'Y'
@ PROW()+1,13 SAY 'This project is required to provide essential;
 services in support of other projects.'
ENDIF
IF OTHPRJ = 'Y'
@ PROW()+1,13 SAY 'The following project(s) is dependent on;
 this project:'
@ PROW()+2,16 SAY OTHNAM
ENDIF
IF PROW() > 50
EJECT
ENDIF
IF VAL(PRJCAT) =1
@ PROW()+2,10 SAY 'R&D Phase:'
@ PROW()+2,13 SAY '1) At Start of FY87:'
```

```
@ PROW()+1,16 SAY RD1
@ PROW()+1,13 SAY '2) At Program Completion:'
@ PROW()+1,16 SAY RD2
ENDIF
IF PROW() > 45
EJECT
ENDIF
IF OIL#0 .OR. GAS#0 .OR. COAL#0 .OR. OTHFUEL#0 .OR. ELECT1#0;
 .OR. ELECT2#0 .OR. UNSPC#0
@ PROW()+3,10 SAY 'Energy Savings Benefits:'
@ PROW()+1,20 SAY '                                                Year 2010'
@ PROW()+1,20 SAY 'Form'
@ PROW(),48 SAY '   (trillion Btu/year)'
@ PROW(),20 SAY '-------------------------------------------------------'
@ PROW()+1,10 SAY ' '
IF OIL # 0
@ PROW()+1,20 SAY 'Oil'
@ PROW(),58 SAY OIL
ENDIF
IF GAS # 0
@ PROW()+1,20 SAY 'Gas'
@ PROW(),58 SAY GAS
ENDIF
IF COAL # 0
@ PROW()+1,20 SAY 'Coal'
@ PROW(),58 SAY COAL
ENDIF
IF OTHFUEL # 0
@ PROW()+1,20 SAY 'Other'
@ PROW(),58 SAY OTHFUEL
ENDIF
IF ELECT1 # 0
@ PROW()+1,20 SAY 'Electricity @ 3412 Btu/kWh saved'
@ PROW(),58 SAY ELECT1
ENDIF
IF ELECT2 # 0
@ PROW()+1,20 SAY 'Electrical Losses @ 8091 Btu/kWh'
@ PROW(),58 SAY ELECT2
ENDIF
IF UNSPC # 0
@ PROW()+1,20 SAY 'Primary Energy Not Specified by Kind '
@ PROW(),58 SAY UNSPC
ENDIF
@ PROW()+1,10 SAY ' '
@ PROW(),20 SAY '-------------------------------------------------------'
@ PROW()+1,20 SAY 'Net Savings (sum of the above)
@ PROW(),56 SAY NETSAV
@ PROW()+1, 5 SAY ' '
ENDIF
IF PROW() > 50
EJECT
ENDIF
*
@ PROW()+2,10 SAY 'Assumptions: '
@ PROW()+2,15 SAY 'Per-Unit Annual Savings:  '
```

```
@ PROW(),45 SAY ANNSAV
@ PROW()+1,15 SAY 'Year 2010 Market (Number of Units):  '+ MARKET
@ PROW()+1,15 SAY 'Maximum Potential Market Penetration (%):  '
@ PROW(),58 SAY MKTMAX
@ PROW()+1,15 SAY 'Market Penetration Curve:'
@ PROW()+1,20 SAY 'Year A:  '+MKTY1
@ PROW()+1,20 SAY 'Year B:  '+MKTY2
@ PROW()+1,20 SAY 'Year C:  '+MKTY3
@ PROW()+2,10 SAY 'Acceleration Period (years):  '+ACCY
*
IF PROW() > 50
EJECT
ENDIF
IF MULTI = 'Y' .OR. ALTFUEL = 'Y' .OR. STOR = 'Y' .OR. ELOAD = 'Y'
@ PROW()+2,10 SAY 'Other Energy-Related Benefits:'
@ PROW()+1,5 SAY ' '
ENDIF
IF MULTI = 'Y'
@ PROW()+1,13 SAY 'o  This technology has multi-fuel capability.'
ENDIF
IF ALTFUEL = 'Y'
@ PROW()+1,13 SAY 'o  This technology uses an alternative;
 fuel to that predominantly'
@ PROW()+1,16 SAY 'used by a conventional technology.'
ENDIF
IF STOR = 'Y'
@ PROW()+1,13 SAY 'o  This technology is designed to store energy.'
ENDIF
IF ELOAD = 'Y'
@ PROW()+1,13 SAY 'o  This technology can be used manage;
 electric loads by'
@ PROW()+1,16 SAY 'shedding peak electricity demand.'
ENDIF
IF PROW() > 50
EJECT
ENDIF
IF NE1 # ' '.OR. NE2 # ' ' .OR. NE3 # ' '.OR. NE4 # ' ' .OR. NE5 # ' '
@ PROW()+3,10 SAY 'Non-Energy Benefits (In order of importance):'
STORE NE1 TO N1
STORE NE2 TO N2
STORE NE3 TO N3
STORE NE4 TO N4
STORE NE5 TO N5
TL = 'Technology Leadership'
IC = 'Industrial Competitiveness'
NS = 'National Security'
SR = 'System Reliability'
PH = 'Public Health'
EQ = 'Environmental Quality'
CC = 'Reduced Consumer Costs'
EM = 'Increased Employment'
IF NE1 #  ' '
@ PROW()+2,15 SAY 'o '+ &N1
ENDIF
IF NE2 # ' '
```

```
@ PROW()+1,15 SAY 'o '+ &N2
ENDIF
IF NE3 # ' '
@ PROW()+1,15 SAY 'o '+ &N3
ENDIF
IF NE4 # ' '
@ PROW()+1,15 SAY 'o '+ &N4
ENDIF
IF NE5 # ' '
@ PROW()+1,15 SAY 'o '+ &N5
ENDIF
ENDIF
IF PROW() > 45
EJECT
ENDIF
@ PROW()+3,10 SAY 'Project Costs:'
@ PROW()+2,15 SAY 'DOE Budgetary Costs                          $ millions'
@ PROW(),15 SAY '                                                        '
@ PROW()+1,20 SAY 'Sunk through FY 86 . . . . . .'
@ PROW(),57 SAY SUNK
@ PROW()+1,20 SAY 'FY 87  . . . . . .'
@ PROW(),58 SAY FY87
@ PROW()+1,20 SAY 'FY 88  . . . . . .'
@ PROW(),58 SAY FY88
@ PROW()+1,20 SAY 'FY 89  . . . . . .'
@ PROW(),58 SAY FY89
@ PROW()+1,20 SAY 'FY 90  . . . . . .'
@ PROW(),58 SAY FY90
@ PROW()+1,20 SAY 'FY 91  . . . . . .'
@ PROW(),58 SAY FY91
@ PROW()+1,20 SAY 'Cumulative FY 87 through Completion. .'
@ PROW(),56 SAY TOTAL
@ PROW()+2,15 SAY 'Private Sector Contributions                 $ millions'
@ PROW(),15 SAY '                                                        '
@ PROW()+1,20 SAY 'Sunk through FY 86 . . . . . .'
@ PROW(),58 SAY PSSUNK
@ PROW()+1,20 SAY 'Cumulative FY 87 through Completion. .'
@ PROW(),56 SAY PSTOT
@ PROW()+2,10 SAY ' Funding Profile:   '+FPROF
*
USE CEKEY
GOTO R
IF PROW()>55
EJECT
ENDIF
@ PROW()+2,10 SAY 'Technical Keywords:'
@ PROW()+2,15 SAY 'Disciplines:  '+DIS1
@ PROW()+1,29 SAY DIS2
@ PROW()+1,29 SAY DIS3
IF PROW()>55
EJECT
@ PROW()+1,10 SAY 'Technical Keywords (Cont.):'
ENDIF
@ PROW()+2,15 SAY 'Materials:   '+MAT1
@ PROW()+1,29 SAY MAT2
```

```
@ PROW()+1,29 SAY MAT3
IF PROW()>55
EJECT
@ PROW()+1,10 SAY 'Technical Keywords (Cont.):'
ENDIF
@ PROW()+2,15 SAY 'Techniques:    '+TQ1
@ PROW()+1,29 SAY TQ2
@ PROW()+1,29 SAY TQ3
IF PROW()>55
EJECT
@ PROW()+1,10 SAY 'Technical Keywords (Cont.):'
ENDIF
@ PROW()+2,15 SAY 'Phenomena:     '+PH1
@ PROW()+1,29 SAY PH2
@ PROW()+1,29 SAY PH3
IF PROW()>55
EJECT
@ PROW()+1,10 SAY 'Technical Keywords (Cont.):'
ENDIF
@ PROW()+2,15 SAY 'Environment:   '+EN1
@ PROW()+1,29 SAY EN2
@ PROW()+1,29 SAY EN3
IF PROW()>55
EJECT
@ PROW()+1,10 SAY 'Technical Keywords (Cont.):'
ENDIF
@ PROW()+2,15 SAY 'Other:         '+OT1
@ PROW()+1,29 SAY OT2
@ PROW()+1,29 SAY OT3
*
IF PROW()>55
EJECT
ENDIF
USE CEMEM
GOTO R
REPORT FORM NOTES FOR RECNO()=R PLAIN NOEJECT TO PRINT
USE CEGEN
@ PROW()+1,5 SAY ' '
EJECT
RELEASE ALL EXCEPT R
RETURN
```

```
*************************************************************************
*************************  SEARCH.PRG   *********************************
*****  THIS PROGRAM SEARCHES A DATA BASE ON A GIVEN FIELD AND DISPLAYS
*****                      THE RECORD ON THE SCREEN
*************************************************************************
SET TALK OFF
SET DEVICE TO SCREEN
CLEAR
STORE .T. TO SEARCH
DO WHILE SEARCH
@ 2,15 SAY '**   CONSERVATION PROJECT DATA BASE   **'
@ 5,27 SAY '***************'
@ 6,27 SAY '* SEARCH MENU *'
@ 7,27 SAY '***************'
@ 9,21 SAY '(1)  TITLE SEARCH'
@ 11,21 SAY '(2)  KEYWORD SEARCH'
@ 13,21 SAY '(3)  BOOLEAN SEARCH'
@ 15,21 SAY '(4)  RETURN TO MAIN MENU'
STORE 0 TO nSR
@ 23,15 SAY 'PLEASE SELECT A NUMBER:' GET nSR PICTURE '9'
READ
CLEAR
DO CASE
   CASE nSR = 1
   DO STITLE
CASE nSR = 2
   DO SKEY
CASE nSR = 3
   DO SBOOL
CASE nSR = 4
   STORE .F. TO SEARCH
   RETURN
ENDCASE
CLEAR
ENDDO SEARCH
RELEASE ALL
RETURN
```

```
**************************STITLE.PRG*************************
***    THIS PROGRAM SEARCHES THE DATA BASES FOR A TITLE   ***
************************************************************
SET TALK OFF
CLEAR
STORE .T. TO aTL
DO WHILE aTL
USE CEGEN INDEX CET
STORE .T. TO ST
DO WHILE ST
CLEAR
@ ROW()+5,15 SAY 'ENTER TITLE TO SEARCH FOR :'
@ ROW()+6,15 SAY ' '
ACCEPT "TITLE:  " TO mTL
LOCATE FOR TITLE =UPPER(mTL)
STORE PRJNO TO pNUM
STORE PRG TO mPR
STORE TITLE TO mTITLE
CLEAR
IF EOF()
CLEAR
@ ROW()+5,25 SAY 'TITLE NOT FOUND'
@ ROW()+2,10 SAY 'WOULD YOU LIKE TO:'
STORE 0 TO SEL
@ ROW()+5,15 SAY '(1) ENTER ANOTHER TITLE'
@ ROW()+2,15 SAY '(2) RETURN TO SEARCH MENU'
@ ROW()+2,15 SAY '(3) RETURN TO MAIN MENU'
@ ROW()+3,15 SAY 'PLEASE SELECT A NUMBER: ' GET SEL PICTURE '9'
READ
DO CASE
CASE SEL = 1
STORE .T. TO ST
CASE SEL = 2
STORE .F. TO ST
STORE .T. TO SEARCH
RETURN
CASE SEL = 3
STORE .F. TO ST
STORE .F. TO SEARCH
RETURN
ENDCASE
ELSE
STORE .F. TO ST
ENDIF EOF
ENDDO ST
SET INDEX TO
CLEAR
STORE .T. TO OPT
DO WHILE OPT
STORE 0 TO INF
************************
@ 5,15 SAY 'SELECT PROJECT INFORMATION TO BE DISPLAYED ON SCREEN'
@ 7,5 SAY '(1) PROJECT IDENTIFICATION       (6) NON-ENERGY BENEFITS'
@ 8,5 SAY '(3) PROJECT DESCRIPTION          (7) PROJECT COSTS'
@ 9,5 SAY '(3) PROJECT JUSTIFICATION         (8) MISC.'
```

```
@ 10,5 SAY '(4) ENERGY SAVINGS                    (9) ALL'
@ 11,5 SAY '(5) ENERGY-RELATED BENEFITS      (10) RETURN TO MAIN MENU'
@ 16,15 SAY 'PLEASE SELECT A NUMBER' GET INF PICTURE '99'
READ
************************
IF INF = 1 .OR. INF = 9
USE CEGEN
LOCATE FOR PRJNO = pNUM .AND. PRG = mPR
SET FORMAT TO GEN1
READ
CLOSE FORMAT
USE
ENDIF
IF INF = 2 .OR. INF = 9
CLEAR
USE CEMEM
LOCATE FOR PRJNO = pNUM .AND. PRG = mPR
DISPLAY OFF PRJDES
USE
@ ROW()+1, 5 SAY ' '
WAIT
ENDIF
IF INF = 3 .OR. INF = 9
CLEAR
USE CEMEM
LOCATE FOR PRJNO = pNUM .AND. PRG = mPR
DISPLAY OFF JUST
USE
@ ROW()+1,5 SAY ' '
WAIT
ENDIF
IF INF = 4 .OR. INF = 9
USE CEGEN
LOCATE FOR PRJNO = pNUM .AND. PRG = mPR
SET FORMAT TO BEN1
READ
@ 16,48 SAY NETSAV
WAIT
CLOSE FORMAT
USE
ENDIF
IF INF = 5 .OR. INF = 9
USE CEGEN
LOCATE FOR PRJNO = pNUM .AND. PRG = mPR
SET FORMAT TO BEN2
READ
CLOSE FORMAT
USE
ENDIF
IF INF = 6 .OR. INF = 9
USE CEGEN
LOCATE FOR PRJNO = pNUM .AND. PRG = mPR
SET FORMAT TO BEN3
READ
CLOSE FORMAT
```

```
USE
ENDIF
IF INF = 7 .OR. INF = 9
USE CEGEN
LOCATE FOR PRJNO = pNUM .AND. PRG = mPR
SET FORMAT TO COS1
READ
CLOSE FORMAT
USE
ENDIF
IF INF = 8 .OR. INF = 9
USE CEGEN
LOCATE FOR PRJNO = pNUM .AND. PRG = mPR
SET FORMAT TO GEN2
READ
WAIT
SET FORMAT TO GEN3
READ
WAIT
SET FORMAT TO GEN4
READ
CLOSE FORMAT
USE
ENDIF
IF INF = 10
STORE .F. TO OPT
STORE .F. TO aTL
STORE .F. TO SEARCH
EXIT
ENDIF
CLEAR
STORE 0 TO aSEL
@ ROW()+2,5 SAY 'Would You Like To:'
@ ROW()+2,10 SAY '(1)  DISPLAY ADDITIONAL INFORMATION FOR:'
@ ROW()+2,15 SAY '"'+ TRIM(mTITLE) + '"'
@ ROW()+2,10 SAY '(2)  SEARCH FOR ANOTHER TITLE'
@ ROW()+2,10 SAY '(3)  RETURN TO SEARCH MENU'
@ ROW()+2,10 SAY '(4)  RETURN TO MAIN MENU'
@ ROW()+3,5 SAY ' Please Select a Number: ' GET aSEL PICTURE '9'
READ
CLEAR
DO CASE
CASE aSEL = 1
STORE .T. TO OPT
CASE aSEL = 2
STORE .F. TO OPT
STORE .T. TO aTL
CASE aSEL = 3
STORE .F. TO OPT
STORE .F. TO aTL
STORE .T. TO SEARCH
RETURN
CASE aSEL = 4
STORE .F. TO OPT
STORE .F. TO aTL
```

```
STORE .F. TO SEARCH
STORE .T. TO MAIN
RETURN TO MASTER
ENDCASE
@ 15,5 SAY ' '
ENDDO OPT
ENDDO aTL
RELEASE ALL
CLOSE FORMAT
RETURN
```

```
*********************SKEY.PRG****************************
***THIS PROGRAM SEARCHES THE DATA BASE ON KEYWORDS*********
*********************************************************
CLEAR ALL
SET TALK OFF
SET DEVICE TO SCREEN
STORE .T. TO KEY
DO WHILE KEY
CLEAR
@ 1,5 SAY 'YOU MAY ENTER UP TO SIX KEYWORDS.  REFER TO THE LIST;
 OF VALID'
@ 2,5 SAY 'TYPES SHOWN ON THE RIGHT AND ENTER THE ASSOCIATED CODE;
 (e.g.,DIS) IN'
@ 3,5 SAY 'THE CODE COLUMN.  KEYWORDS CAN BE ALL ONE TYPE, OR;
 DIFFERENT TYPES'
@ 6,5 SAY 'TYPE             KEYWORD                      TYPE CODES '
@ 7,5 SAY '____    _____________________________      _______________
STORE 0 TO TN
@ 8,44 SAY 'DISCIPLINE (DIS)'
@ 9,44 SAY 'MATERIAL (MAT)'
@ 10,44 SAY 'TECHNIQUE (TQ)'
@ 11,44 SAY 'PHENOMENA (PH)'
@ 12,44 SAY 'ENVIRONMENT (EN)'
@ 13,44 SAY 'OTHER (OT)'
DO WHILE TN < 7
STORE TN+1 TO TN
STORE CHR(TN+64) TO TYPE
STORE CHR(TN+70) TO KEY
STORE '    ' TO &TYPE
STORE '                              ' TO &KEY
@ TN+7,5 GET &TYPE
@ TN+7,12 GET &KEY
READ
CLEAR GET
IF &TYPE = ' '
STORE TN-1 TO TN
EXIT
ENDIF
STORE .F. TO FLAG1
STORE 0 TO LL
DO WHILE LL<24
STORE 1+LL TO LL
STORE CHR(LL+64) TO CODE
IF TRIM(&CODE) = TRIM(&TYPE)
STORE .T. TO FLAG1
EXIT
ENDIF
ENDDO
IF .NOT. FLAG1
@ 22,2 SAY 'IMPROPER TYPE CODE'
? CHR(7)
@ 22,2 SAY '                    '
STORE TN-1 TO TN
LOOP
ENDIF
```

```
ENDDO
STORE 0 TO TC
CLEAR
DO WHILE TC<TN
STORE TC+1 TO TC
STORE CHR(64+TC) TO TYPE
STORE CHR(70+TC) TO KEY
@ ROW()+1,5 SAY TYPE+": KEYWORD <"+TRIM(&KEY)+">"
STORE "'"+TRIM(&KEY)+"'" TO &KEY
STORE TRIM(&TYPE) +'1'+'='+&KEY+'.OR.'+TRIM;
(&TYPE)+'2'+'='+&KEY+'.OR.'+TRIM(&TYPE)+'3'+'='+&KEY TO TY
*
IF TC =1
USE CEKEY
ELSE
USE &FILE
ENDIF
STORE 'FILE'+CHR(64+TC) TO FILE
SET FILTER TO &TY
COPY TO &FILE
*
ENDDO WHILE TC
*
USE &FILE
COUNT TO XTOT
USE CEKEY
GO TOP
COUNT TO TOT
USE
PCT = (XTOT/TOT)*100
@ 8,1 CLEAR
@ ROW()+3,15 SAY XTOT PICTURE '999'
@ ROW(),19 SAY  ' PROJECT(S) LIST THE SPECIFIED KEYWORDS:'
@ ROW()+2,5 SAY 'THIS REPRESENTS '
@ ROW(),COL()+1 SAY PCT PICTURE '999.99'
@ ROW(),COL()+1 SAY 'PERCENT OF THE '
@ ROW(),COL() SAY TOT PICTURE '9999'
@ ROW(),COL()+1 SAY 'CONSERVATION PROJECTS'
@ ROW()+1,5 SAY ' '
*
WAIT
STORE .T. TO OPTION
DO WHILE OPTION
CLEAR
STORE 0 TO AN
@ 5,5 SAY 'FOR THE PROJECTS THAT LIST THESE KEYWORDS, DO YOU;
 WANT TO :'
@ 7,10 SAY '(1) DISPLAY PROJECT TITLES ON SCREEN'
@ 9,10 SAY '(2) PRINT PROJECT TITLES'
@ 11,10 SAY '(3) PRINT PROJECT INFORMATION'
@ 13,10 SAY '(4) RETURN TO KEYWORD SEARCH'
@ 15,10 SAY '(5) RETURN TO MAIN MENU'
@ 18,5 SAY 'PLEASE SELECT AN OPTION: 'GET AN PICTURE '9'
READ
SELECT 1
```

```
USE &FILE
SELECT 2
USE CEGEN
*
DO CASE
 CASE AN = 5
  CLEAR ALL
  STORE .F. TO OPTION
  STORE .F. TO KEY
  RETURN TO MASTER
 CASE AN=4
  STORE .F. TO OPTION
  CLEAR ALL
 CASE AN = 1
  SET HEADING OFF
  CLEAR
  @2,1 SAY 'PRG    TITLE'
  STORE 1 TO R
  DO WHILE R<=XTOT
  SELECT 1
  GOTO R
  SELECT 2
  LOCATE FOR PRG=A->PRG .AND. PRJNO=A->PRJNO
  DISPLAY OFF PRG, TITLE
  STORE 1+R TO R
  ENDDO R<=XTOT
  WAIT
  CLEAR
  SET HEADING ON
 CASE AN = 2
  CLEAR
  SET HEADING OFF
  SET DEVICE TO PRINT
  @ PROW()+2,10 SAY 'PRG  TITLE'
  STORE 1 TO R
  DO WHILE R<=XTOT
  SELECT 1
  GOTO R
  SELECT 2
  LOCATE FOR PRG=A->PRG .AND. PRJNO=A->PRJNO
  @ PROW()+1,10 SAY PRG
  @ PROW(),15 SAY TITLE
  STORE 1+R TO R
  ENDDO R<=XTOT
  SET DEVICE TO SCREEN
  SET HEADING ON
  CLEAR
CASE AN = 3
  CLEAR
  SET DEVICE TO PRINT
  STORE 1 TO T
  DO WHILE T<=XTOT
  SELECT 1
  GOTO T
  SELECT 2
```

```
  LOCATE FOR PRG=A->PRG .AND. PRJNO=A->PRJNO
  STORE RECNO() TO R
  DO REP2
  STORE 1+T TO T
  SET DEVICE TO SCREEN
  ENDDO T<=XTOT
ENDCASE
ENDDO OPTION
ENDDO KEY
CLEAR ALL
*
RETURN
```

```
**********************SBOOL.PRG*********************
******THIS PROGRAM WILL SEARCH SPECIFIED FIELDS FOR **
******GIVEN CHARACTER STRINGS WITH UP TO SIX TERMS ***
******          IN A BOOLEAN EXPRESSION      **********
****************************************************
CLEAR
SET TALK OFF
SET DEVICE TO SCREEN
@ ROW()+1,5 SAY 'This program will search the data base for;
 records that meet'
@ ROW()+1,5 SAY 'the constraints specified below.  Up to six;
 constraints may'
@ ROW()+1,5 SAY 'be entered.  Refer to the USER MANUAL for;
 allowable field'
@ ROW()+1,5 SAY 'names and operators.'
@ ROW()+2,2 SAY 'FIELD'
@ ROW()+1,2 SAY 'NAME    TYPE  OP  SEARCH DATA'
STORE 0 TO TN
DO WHILE TN <= 5
STORE TN + 1 TO TN
STORE CHR(TN+64) TO FD
STORE CHR(TN+70) TO TY
STORE CHR(TN+76) TO OP
STORE CHR(TN+82) TO ST
STORE '         ' TO &FD
STORE ' ' TO &TY
STORE '  ' TO &OP
STORE '                                          ' TO &ST
@ TN+7,2 GET &FD
@ TN+7,11 GET &TY
@ TN+7,16 GET &OP
@ TN+7,20 GET &ST
READ
CLEAR GET
IF &FD=' '
STORE TN-1 TO TN
EXIT
ENDIF
STORE .F. TO FLAG1
STORE 0 TO LL
DO WHILE LL<15
STORE 1+LL TO LL
STORE CHR(LL+64) TO CODE
IF TRIM(&CODE) = TRIM(&FD)
STORE .T. TO FLAG1
EXIT
ENDIF
ENDDO
IF .NOT. FLAG1
@ 22,2 SAY 'IMPROPER FIELD NAME'
? CHR(7)
@ 22,2 SAY '                    '
STORE TN-1 TO TN
LOOP
ENDIF
```

```
ENDDO
STORE 0 TO LINE
STORE 0 TO TC
CLEAR
DO WHILE TC<TN
STORE TC+1 TO TC
STORE CHR(64+TC) TO FD
STORE CHR(70+TC) TO TY
STORE CHR(76+TC) TO OP
STORE CHR(82+TC) TO ST
@ ROW()+1,5 SAY FD +": "+TRIM(&FD)+' '+ TRIM(&OP)+ " '" +;
 TRIM(&ST)+"' "
IF UPPER(&TY) = 'C'
STORE ' '+TRIM(UPPER(&FD))+' '+TRIM(&OP)+" '"+TRIM(UPPER(&ST))+;
"'" TO &FD
ENDIF
IF UPPER(&TY) = 'N'
STORE ' '+TRIM(&FD)+' '+TRIM(&OP)+' '+TRIM(&ST) TO &FD
ENDIF
ENDDO WHILE TC
STORE .T. TO ERR
STORE '                              ' TO BOOL
DO WHILE ERR
CLEAR GET
STORE .F. TO ERR
@ ROW()+2,5 SAY 'USE THE CODES ON THE RIGHT TO       CODE ;
   BOOLEAN OPERATOR'
@ ROW()+1,5 SAY 'WRITE A BOOLEAN EXPRESSION           *  ;
          OR'
@ ROW()+1,5 SAY '[e.g., (A+B)*(C+D) represents        +  ;
          AND'
@ ROW()+1,5 SAY '(A and B) or (C and D)]'
@ ROW()+2,15 GET BOOL
READ
IF UPPER(BOOL) = 'R' .OR. BOOL ='"'
RETURN
ENDIF UPPER(BOOL)
STORE LEN(TRIM(BOOL)) TO LENG
STORE LENG-1 TO LR
STORE ' ' TO EXPR
DO WHILE LR>=0
    STORE SUBSTR(BOOL,LENG-LR,1) TO CDR
    DO CASE
      CASE ASC(CDR)>45
        EXPR=TRIM(EXPR)+&CDR
      CASE ASC(CDR)=40 .OR. ASC(CDR)=41
        EXPR=TRIM(EXPR)+CDR
      CASE ASC(CDR)=43
        EXPR=TRIM(EXPR)+'  .AND.  '
      CASE ASC(CDR)=42
        EXPR=TRIM(EXPR)+'  .OR.  '
      OTHERWISE
        STORE .T. TO ERR
        CLEAR
        @ ROW(),5 SAY 'ILLEGAL CHARACTER IN EXPRESSION'
```

```
        ? CHR(7)
    ENDCASE
    STORE LR-1 TO LR
  ENDDO WHILE LR>=
ENDDO WHILE ERR
@ 15,1 SAY 'EXPRESSION: '
@ 15,14 SAY EXPR
@ 18,5 SAY ' '
WAIT
USE CEGEN
COUNT FOR &EXPR TO XTOT
GO TOP
COUNT TO TOT
PCT = (XTOT/TOT)*100
GO TOP
SUM FY87 TO BUD FOR &EXPR
GO TOP
SUM FY87 TO BUDGET
PTB= BUD/BUDGET
CLEAR
@ 5,15 SAY XTOT PICTURE '999'
@ 5,COL()+1 SAY  ' PROJECT(S), WITH A CUMMULATIVE BUDGET OF $'
@ 5,COL()+1 SAY BUD PICTURE '99.999'
@ 6,15 SAY ' MEET THE FOLLOWING CRITERIA:'
@ 8,5 SAY EXPR
@ 10,5 SAY 'THIS REPRESENTS: '
@ 11,5 SAY '1. '
@ 11, COL()+1 SAY PCT PICTURE '999.99'
@ 11,COL()+1 SAY '% OF THE '
@ 11,COL() SAY TOT PICTURE '9999'
@ 11,COL()+1 SAY 'CONSERVATION PROJECTS'
@ 12,5 SAY '2. '
@ 12,COL()+1 SAY PTB PICTURE '999.99'
@ 12,COL()+1 SAY '% OF THE TOTAL BUDGET'
@ 13,5 SAY ' '
WAIT
STORE .T. TO OPTION
DO WHILE OPTION
CLEAR
STORE 0 TO AN
@ 5,5 SAY 'FOR THE PROJECTS THAT MEET THESE CRITERIA,;
 DO YOU WANT TO :'
@ 7,10 SAY '(1) DISPLAY PROJECT TITLES ON SCREEN'
@ 9,10 SAY '(2) PRINT PROJECT TITLES'
@ 11,10 SAY '(3) PRINT PROJECT INFORMATION'
@ 13,10 SAY '(4) RETURN TO SEARCH MENU'
@ 15,10 SAY '(5) RETURN TO MAIN MENU'
@ 19,5 SAY 'SELECT AN OPTION OR PRESS <RETURN> TO EXIT TO;
 MAIN MENU 'GET AN PICTURE '9'
READ
DO CASE
CASE AN = 0
STORE .F. TO OPTION
STORE .F. TO SEARCH
RETURN
```

```
CASE AN = 4
STORE .F. TO OPTION
STORE .T. TO SEARCH
RETURN
CASE AN = 5
STORE .F. TO OPTION
STORE .F. TO SEARCH
RETURN
CASE AN = 1
CLEAR
USE CEGEN
STORE 1 TO R
DISPLAY ALL FIELDS PRJNO, TITLE FOR &EXPR OFF
WAIT
CASE AN = 2
CLEAR
USE CEGEN
DISPLAY ALL FIELDS PRJNO, TITLE OFF TO PRINT
CASE AN = 3
STORE .T. TO EX
STORE 0 TO R
DO WHILE EX
USE CEGEN
STORE 1+R TO R
IF R > TOT
RETURN
ENDIF
GOTO R
LOCATE NEXT 999 FOR &EXPR
STORE RECNO() TO R
DO REP1
IF EOF()
STORE .F. TO EX
ENDIF
ENDDO
SET DEVICE TO SCREEN
ENDCASE
ENDDO OPTION
USE
RELEASE ALL
RETURN
```

```
************************HELP.PRG*****************************
***THIS PROGRAM PROVIDES A BRIEF DESCRIPTION OF THE OPTIONS**
****************AVAILABLE FROM THE MAIN MENU*****************
STORE 0 TO HP
CLEAR
@ ROW()+5,2 SAY 'SELECT NUMBER OF ITEM YOU WOULD LIKE HELP WITH: ';
GET HP PICTURE '9'
@ ROW()+2,15 SAY '(1)  ENTER DATA'
@ ROW()+2,15 SAY '(2)  EDIT DATA'
@ ROW()+2,15 SAY '(3)  REPORTING'
@ ROW()+2,15 SAY '(4)  SEARCHING'
@ ROW()+2,15 SAY '(5)  EXIT WITH BACKUP'
@ ROW()+2,15 SAY '(6)  EXIT WITHOUT BACKUP'
READ
CLEAR
DO CASE
CASE HP = 1
TEXT
ENTER DATA: ;
This option allows a new project to be added to the data base.
Formatted screens are presented for entering data.
Simply type the requested information in the highlighted spaces.
Use the <RETURN> key to move from one item to the next.  The position
arrows can also be used.  If the data completely fills the space
provided, the cursor will automatically jump to the next item.
When you are through entering data on a particular screen, press
PgDn to go to the next screen.

Refer to Section 4.2 of the User Manual.

ENDTEXT
WAIT
CASE HP=2
TEXT
EDIT DATA:;
This option allows the existing data to be changed.  Formatted
screens are presented, showing the data that is currently in the
data base.  To make a correction, the new data is simply typed
over the existing data.  The user has the option to edit all data,
in which case each formatted screen is displayed sequentially, or
to edit a given data set, in which case only the pertinent screens
are presented.

Refer to Section 4.3 of the User Manual.

ENDTEXT
WAIT
CASE HP =3
TEXT
PRINT REPORT: ;
Currently, there are three reporting formats: (1) A brief
project description sheet similar to that in the 1985 Multi-
Year Program Plan, (2) an expanded project description sheet,
similar to those in the 1986 Multi-Year Program Plan, and (3) an
unformatted listing of all the data in the data bases.  The user
```

```
can elect to print reports for all projects in the data base,
for all projects in a selected program area, or for a given
project.

Refer to Section 4.4 of the User Manual.

ENDTEXT
WAIT
CASE HP=4
TEXT
SEARCH:;
This program allows the user to search the data base for a given
project title, for a combination of keywords, or for a combination of
field constraints combined in a boolean expression.  The title search
program allows the user to display all or selected information for
that project on the screen.  The keyword search and boolean search
programs allow the user to display the titles of the projects that
meet the specified conditions on the screen, print the titles, or
print expanded description sheets for the projects.

Refer to Section 4.5 of the User Manual.

ENDTEXT
WAIT
CASE HP=5
TEXT
STOP:;
This option returns the user to the DOS operating system.  If any
changes have been made to the data bases, backup copies of the data
files should be made to protect against loss of data.

Refer to Section 4.7 of the User Manual.

ENDTEXT
WAIT
ENDCASE
RETURN
```

```
**************************GEN1.FMT*******************************
****FORMATTED SCREEN #1 FOR ADDING RECORDS TO GENERAL FILES*****
************************************************************************
@ 1,2 SAY '1. Project Title' GET TITLE
@ 3,2 SAY '2. Project Identification'
@ 4,5 SAY 'A. Program:' GET PRG
@ 5,5 SAY 'B. Subprogram:' GET SUBPRG
@ 6,5 SAY 'C. Area:' GET AREA
@ 7,5 SAY 'D. Key Activity:' GET KEYACT
@ 9,2 SAY '3. DOE Project Manager'
@ 10,5 SAY 'A. Name:' GET DOEPM
@ 11,5 SAY 'B. Phone:' GET DOEPH
@ 13,2 SAY '4. Contractor°s Project Manager'
@ 14,5 SAY 'A. Name(Last,First,MI):' GET CONPM
@ 15,5 SAY 'B. Research Organization:' GET CONORG
@ 16,5 SAY 'C. Street Address:' GET CONSTR
@ 17,5 SAY '   City:' GET CONCITY
@ 17,45 SAY 'State:' GET CONSTATE
@ 17,55 SAY 'Zipcode:' GET CONZIP
@ 18,5 SAY 'D. Phone:' GET CONPH
@ 19,5 SAY 'E. Type of Organization:' GET CONTYPE
@ 20,10 SAY '1=Private Industry              5=State or Local Government'
@ 21,10 SAY '2=DOE Laboratory                6=Combinations of the Above'
@ 22,10 SAY '3=Other Federal Organization    7=To Be Determined'
@ 23,10 SAY '4=University'
```

```
*****************************GEN2.FRM*******************************
****FORMATTED SCREEN  #2 FOR ADDING RECORDS TO GENERAL FILES****
**********************************************************************
@ 1,15 SAY '**   CONSERVATION PROJECT DATA BASE   **'
@ 3,5 SAY 'PROJECT TITLE:  '+ TITLE
@ 5,5 SAY '7. PROGRAM INTERRELATIONSHIPS'
@ 7,10 SAY 'A.  Mandated Project [Y/N]:' GET LAW
@ 9,10 SAY 'B.  Program Support [Y/N]:' GET PRJSUP
@ 11,10 SAY 'C.  Necessary for Completion of Another Project;
 [Y/N]:' GET OTHPRJ
@ 14,10 SAY '    If Yes, enter title of other project:'
@ 15,14 GET OTHNAM
```

```
*****************************GEN3.FMT*****************************
****FORMATTED SCREEN #3 FOR ADDING RECORDS TO GENERAL FILES****
******************************************************************
@ 3,5 SAY 'PROJECT TITLE:  ' + TITLE
@ 5,5 SAY '8. PROJECT CATEGORY = '  GET PRJCAT
@ 7,5 SAY 'Category Codes:'
@ 8,8 SAY '1 = Technology R&D'
@ 9,8 SAY '2 = Technology Assessment/Feasibility Study'
@ 10,8 SAY '3 = Health Effects and Safety Research'
@ 11,8 SAY '4 = Technical Support for Rule-Making'
@ 12,8 SAY '5 = Program and Policy Evaluation'
@ 13,8 SAY '6 = Energy and Economic Data Development or Analysis'
@ 14,8 SAY '7 = Mathematical Model Development'
@ 15,8 SAY '8 = Consumer Information on Energy Efficiency (General;
 Public)'
@ 16,8 SAY '9 = Technology Transfer/Research Publications (Technical;
 Community)'
@ 17,7 SAY '10 = Other'
```

```
*****************************GEN4.FRM*******************************
****FORMATTED SCREEN #4 FOR ADDING RECORDS TO GENERAL FILES****
********************************************************************
@ 1,5 SAY 'Project Title:  ' + TITLE
@ 3,25 SAY '9.  R&D PHASE'
@ 5,2 SAY 'A. Phase at Start of FY 1987:' GET PHASE1
@ 5,37 SAY 'B. Phase at Project Completion:' GET PHASE2
@ 7,7 SAY 'Phase codes are defined as follows:'
@ 9,7 SAY '1  Generic Research'
@ 10,7 SAY '2a Explore Product/Process Innovation and Concepts'
@ 11,7 SAY '2b Documentation and Theoretical Assessment of System;
 Elements'
@ 12,7 SAY '2c Laboratory Testing and Evaluation of System Elements'
@ 13,7 SAY '3a System Engineering Design and Analysis'
@ 14,7 SAY '3b Detailed Engineering-Scale Design'
@ 15,7 SAY '4a Design Pilot-Scale Prototype'
@ 16,7 SAY '4b Build and Test Pilot-Scale Prototype'
@ 17,7 SAY '4c Evaluate Pilot-Scale Test Results'
@ 18,7 SAY '4d Design Full-Scale Proof-of-Principle Unit'
@ 19,7 SAY '4e Build and Test Full-Scale Proof-of-Principle Unit'
@ 20,7 SAY '4f Evaluate Full-Scale Proof-of-Principle Test Results'
@ 21,7 SAY '5  Demonstration Testing'
@ 22,7 SAY '6  Commercialization, Production and Operation'
```

```
************************GEN5.FMT*************************************
***CUSTOM SCREEN #5 FOR DATA ENTRY PROGRAM*************************
*********************************************************************
@ 1,5 SAY 'Project Title:  ' + TITLE
@ 3,5 SAY '10. TECHNICAL KEYWORDS'
@ 5,15 SAY 'A. Disciplines'
@ 6,13 SAY '1.' GET DIS1
@ 7,13 SAY '2.' GET DIS2
@ 8,13 SAY '3.' GET DIS3
@ 10,15 SAY 'B. Materials'
@ 11,13 SAY '1.' GET MAT1
@ 12,13 SAY '2.' GET MAT2
@ 13,13 SAY '3.' GET MAT3
@ 15,15 SAY 'C. Techniques'
@ 16,13 SAY '1.' GET TQ1
@ 17,13 SAY '2.' GET TQ2
@ 18,13 SAY '3.' GET TQ3
@ 20,15 SAY 'D. Phenomena'
@ 21,13 SAY '1.' GET PH1
@ 22,13 SAY '2.' GET PH2
@ 23,13 SAY '3.' GET PH3
```

```
**********GEN6.FMT**********
************************************************
@ 1,5 SAY 'Project Title:  ' + mTITLE
@ 3,5 SAY '10. TECHNICAL KEYWORDS (continued)'
@ 5,15 SAY 'E. Environment'
@ 6,13 SAY '1.' GET EN1
@ 7,13 SAY '2.' GET EN2
@ 8,13 SAY '3.' GET EN3
@ 10,15 SAY 'F. Other'
@ 11,13 SAY '1.' GET OT1
@ 12,13 SAY '2.' GET OT2
@ 13,13 SAY '3.' GET OT3
```

```
************************BEN1.FMT**********************************
***  FORMATTED SCREEN # 1 FOR ADDING RECORDS TO BENEFITS FILES
*****************************************************************
@ 1,5 SAY 'Project Title:  ' + mTITLE
@ 3,5 SAY '11. ENERGY SAVINGS'
@ 5,10 SAY '                                              Year 2010'
@ 6,10 SAY 'Form'
@ 6,46 SAY '(trillion Btu/year)'
@ 7,10 SAY '_____________________________________________________';
          '_______'
@ 8,10 SAY 'A. Oil                                        ' GET OIL
@ 9,10 SAY 'B. Gas                                        ' GET GAS
@ 10,10 SAY 'C. Coal                                       ' GET COAL
@ 11,10 SAY 'D. Other                                      ' GET OTHFUEL
@ 12,10 SAY 'E. Electricity @ 3412 Btu/kWh saved           ' GET ELECT1
@ 13,10 SAY 'F. Electrical Losses @ 8091 Btu/kWh           ' GET ELECT2
@ 14,10 SAY 'G. Primary Energy Not Specified by Kind'  GET UNSPC
@ 15,10 SAY '_____________________________________________________';
          '_______'
@ 16,10 SAY 'H. Net Savings (sum of the above)             '
```

```
************************BEN2.FMT************************************
*** FORMATTED SCREEN # 2 FOR ENTERING DATA INTO BENEFITS FILE ****
********************************************************************
@ 1,5 SAY 'Project Title:  ' + mTITLE
@ 3,3 SAY '12. ASSUMPTIONS FOR ENERGY SAVINGS'
@ 5,10 SAY 'A. Per-unit Annual Savings: ' GET ANNSAV
@ 6,10 SAY '   Units: ' GET UNITS
@ 7,10 SAY 'B. Year 2010 Market (number of units): 'GET MARKET
@ 8,10 SAY 'C. Maximum Potential Market Penetration (%): ' GET;
 MKTMAX
@ 9,10 SAY 'D. Market Penetration Curve'
@ 10,15 SAY 'Year a: ' GET MKTY1
@ 11,15 SAY 'Year b: ' GET MKTY2
@ 12,15 SAY 'Year c: ' GET MKTY3
@ 14,3 SAY '13. ACCELERATION PERIOD (number of years): ' GET;
 ACCY
@ 16,3 SAY '14. OTHER ENERGY-RELATED BENEFITS'
@ 18,10 SAY 'A. Multiple Fuels Capability (Y/N): ' GET MULTI
@ 19,10 SAY 'B. Alternative Fuel Benefits (Y/N): ' GET ALTFUEL
@ 20,10 SAY 'C. Energy Storage Benefit (Y/N): ' GET STOR
@ 21,10 SAY 'D. Electric Load Management Benefit (Y/N): ' GET;
 ELOAD
```

```
*******************************BEN3.FMT*******************************
***** FORMATTED SCREEN # 3 FOR ENTERING BENEFITS DATA ************
**********************************************************************
@ 1,5 SAY 'Project Title:  ' + mTITLE
@ 3,25 SAY '15. NON-ENERGY BENEFITS'
@ 5,8 SAY 'Benefits are prioritized on a scale of 0 to 5 with'
@ 6,8 SAY 'a score of 5 indicates a major national benefit and'
@ 7,8 SAY 'a score of 0 indicates no significant or known effect'
@ 9,8 SAY 'ENTER THE CODE FROM THE LIST ON THE RIGHT FOR UP TO;
 FIVE'
@ 10,8 SAY 'NON-ENERGY BENEFITS'
@ 12,15 SAY '5 = ' GET NE1
@ 12,40 SAY 'TL (Technology Leadership)'
@ 13,40 SAY 'IC (Industrial Competiveness)'
@ 14,15 SAY '4 = ' GET NE2
@ 14,40 SAY 'NS (National Security)'
@ 15,40 SAY 'SR (System Reliability)'
@ 16,15 SAY '3 = ' GET NE3
@ 16,40 SAY 'PH (Public Health)'
@ 17,40 SAY 'EQ (Environmental Quality)'
@ 18,15 SAY '2 = ' GET NE4
@ 18,40 SAY 'CC (Reduced Consumer Costs)'
@ 19,40 SAY 'EM (Increased Employment)'
@ 20,15 SAY '1 = ' GET NE5
```

```
*********************************************************
******COS1.FMT*******************************************
*********************************************************
@ 1,5 SAY 'Project Title:  ' + mTITLE
@ 3,5 SAY '16. PROJECT COSTS'
@ 5,8 SAY 'A. DOE Budgetary Costs'
@ 6,30 SAY '$ Millions'
@ 7,10 SAY '- Sunk through FY 1986: ' GET SUNK
@ 8,10 SAY '- FY 1987:               ' GET FY87
@ 9,10 SAY '- FY 1988:               ' GET FY88
@ 10,10 SAY '- FY 1989:               ' GET FY89
@ 11,10 SAY '- FY 1990:               ' GET FY90
@ 12,10 SAY '- FY 1991:               ' GET FY91
@ 13,10 SAY '- Cumulative FY 87'
@ 14,10 SAY '  through completion: ' GET TOTAL
@ 16,8 SAY 'B. Private Sector Contributions'
@ 18,10 SAY '- Sunk through FY 1986: ' GET PSSUNK
@ 19,10 SAY '- Cumulative FY 1987'
@ 20,10 SAY '  through completion: ' GET PSTOT
@ 22,5 SAY '17. FUNDING PROFILE: ' GET FPROF
@ 22,30 SAY '[Over Planning Horizon]'
@ 24,5 SAY '1 = Decreasing, 2 = Peaking,;
 3 = Increasing, 4 = Level, 5 = Variable'
```

APPENDIX B: SAMPLE REPORTS

THIN STRIP CASTING

Subprogram: INDUSTRIAL PROCESS EFFICIENCY

Area: MATERIALS PROCESSING

Project Category: TECHNOLOGY R&D

DOE Project Manager: J.C. FULTON (202) 252-8668

Description:

The program objective is the development of a process to directly cast steel strip in thin (1/2 inch - 1 inch) thicknesses so that it requires minimum rolling to produce the total range of hot and cold rolled steel sheets with major energy savings.

Justification:

This program involves long-range, high-risk technology requiring extensive funds to demonstrate feasibility. The industry, due to worldwide product competition, does not have the funds to pursue the development.

Program Interrelationships:

This project is mandated by law.

R&D Phase:

1) At Start of FY87:
   Laboratory Testing and Evaluation of System Elements
2) At Program Completion:
   Evaluate Pilot-Scale Test Results

Energy Savings Benefits:

Form	Year 2010 (trillion Btu/year)
Oil	50.0
Gas	50.0
Coal	100.0
Net Savings (sum of the above)	200.0

Non-Energy Benefits (In order of importance):

- o Industrial Competitiveness
- o Reduced Consumer Costs
- o Technology Leadership
- o System Reliability
- o Increased Employment

Project Costs:

DOE Budgetary Costs	$ millions
Sunk through FY 86	.19.000
FY 87	.12.000
FY 88	.10.500
FY 89	5.000
FY 90	0.000
FY 91	0.000
Cumulative FY 87 through Completion	27.500

Private Sector Contributions	$ millions
Sunk through FY 86	2.500
Cumulative FY 87 through Completion	4.500

CONSERVATION MULTI-YEAR PROGRAM PLAN

Program Office: INDUSTRY PROGRAM

Subprogram: INDUSTRIAL PROCESS EFFICIENCY

Area: MATERIALS PROCESSING

Project Title: THIN STRIP CASTING

Description:

The program objective is the development of a process to directly cast steel strip in thin (1/2 inch - 1 inch) thicknesses so that it requires minimum rolling to produce the total range of hot and cold rolled steel sheets with major energy savings.

Justification:

This program involves long-range, high-risk technology requiring extensive funds to demonstrate feasibility. The industry, due to worldwide product competition, does not have the funds to pursue the development.

Costs:

Federal ($ Million): Cost to complete project is $27.500 million

PRE-FY 1987 Total	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991
19.000	12.000	10.500	5.000	0.000	0.000

H.Q. Point of Contact: J.C. FULTON

Telephone Number: (202) 252-8668

THIN STRIP CASTING

Subprogram: INDUSTRIAL PROCESS EFFICIENCY

Area: MATERIALS PROCESSING

Project Category: TECHNOLOGY R&D

DOE Project Manager: J.C. FULTON (202) 252-8668

Contractor°s Project Manager: MOORE, MICHAEL
U.S.STEEL TECHNICAL CENTER
1 TECH CENTER DRIVE
MONROEVILLE,PA 15146

Type of Organization: 1

Description:

The program objective is the development of a process to directly cast steel strip in thin (1/2 inch - 1 inch) thicknesses so that it requires minimum rolling to produce the total range of hot and cold rolled steel sheets with major energy savings.

Justification:

This program involves long-range, high-risk technology requiring extensive funds to demonstrate feasibility. The industry, due to worldwide product competition, does not have the funds to pursue the development.

Program Interrelationships:

This project is mandated by law.

R&D Phase:

1) At Start of FY87:
   Laboratory Testing and Evaluation of System Elements
2) At Program Completion:
   Evaluate Pilot-Scale Test Results

Energy Savings Benefits:

Form	Year 2010 (trillion Btu/year)
Oil	50.0
Gas	50.0
Coal	100.0
Net Savings (sum of the above)	200.0

Assumptions:

Per-Unit Annual Savings: 6700000
Year 2010 Market (Number of Units): 30
Maximum Potential Market Penetration (%): 50
Market Penetration Curve:
Year A: 1990
Year B: 2000
Year C: 2020

Acceleration Period (years): 10

Non-Energy Benefits (In order of importance):

- o Industrial Competitiveness
- o Reduced Consumer Costs
- o Technology Leadership
- o System Reliability
- o Increased Employment

Project Costs:

DOE Budgetary Costs	$ millions
Sunk through FY 86	.19.000
FY 87	.12.000
FY 88	.10.500
FY 89	5.000
FY 90	0.000
FY 91	0.000
Cumulative FY 87 through Completion.	.27.500

Private Sector Contributions	$ millions
Sunk through FY 86	2.500
Cumulative FY 87 through Completion.	4.500

Funding Profile: 1

Technical Keywords:

Disciplines: METALLURGY
MATERIALS SCIENCE
PHYSICS

Technical Keywords (Cont.):

Materials: FERROUS METALS

Techniques: MELTING
CASTING
COMPUTER SIMULATION

Phenomena: HEAT TRANSFER
MATERIALS PROPERTIES

Environment: HIGH TEMPERATURE
MOLTEN METAL

Other: CHEMISTRY
MECHANICAL ENGINEERING
COMPUTER CONTROL

Notes:

Second contractor : Male, Slan T. Westinghouse Research Center 1310 Beulah Road Pittsburgh, PA 15235 Both projects use the same energy savings base. Energy savings are not duplicative.

APPENDIX C: TROUBLE-SHOOTING GUIDE

This appendix provides instructions for recovering from certain abnormal events that may occur during the execution of the CEDATA program. Included in this section are discussions of the following:

- Abnormal Termination
- Disk Full Message
- Loss of Data

ABNORMAL TERMINATION

The adaptation of any newly developed computer code raises the possibility of abnormal termination during the execution of the code. In the event that this should occur during the execution of CEDATA, a general message will be printed on the screen: (1) indicating the type of problem that has occurred and the program and/or subprogram(s) in which the problem occurred, and (2) asking the user whether the command file should be terminated.

When the screen asks whether or not to terminate the command file, the following steps should be taken:

1. Type Y to terminate the command file.

2. Type CLEAR ALL to close any open files.

3. Type DO CEDATA to restart the applications program.

4. If termination occurred during the data entry (ADD.PRG) or the data edit (EDIT.PRG) program, you should check the data base to see if the data you were entering before the termination has been stored. The edit program or the title search program can be used to display the project information on the screen for this check.

DISK FULL MESSAGE

Each time you add data to a data base or edit a data base, a backup file of the original data base is automatically made. The backup file has the same file name as the original file and the file extension .BAK. The storage of backup files will at times create a shortage of storage space on the disk (most likely to occur on a floppy disk). Data files should be backed up on separate disks as discussed in Section 4.7, rather than relying on these backup files. To prevent a disk full error message from occurring, the user can erase the backup files from the disk before entering the dBase III program by typing the following after the DOS prompt:

ERASE *.BAK* This eliminates all backup files on the current drive.

If insufficient storage space is encountered during program execution, the following message will appear:

```
Disk full when writing file - FILENAME
Abort, Ignore, or Delete old files (A, I or D)?
```

Abort

Selecting the abort (A) option causes the program to terminate its attempt to copy the file. The following message will appear:

```
**WARNING** Data will probably be lost
  confirm (Y/N)?
```

If you type Y, the data will be lost and the screen will display the dot prompt. Typing N will produce the disk full error message again.

Ignore

Selecting the ignore (I) option causes the program to reattempt to copy the file. Most likely this will be unsuccessful and the disk full error message will again be displayed.

Delete

Selecting the delete (D) option causes the program to sequentially display all of the files currently stored on the disk. The user is given the option of deleting each file as it appears on the screen in order to make more room on the disk. Files with file extension .BAK should be deleted first. After the entire list has been displayed, the program will automatically continue its attempt to copy the file. If sufficient space is still unavailable, the disk full error message will again appear.

LOSS OF DATA

Loss of data from floppy or hard disk files can occur as a result of power surges or operator error. Surge-protection devices can be used to prevent the occurrence of the first type of data loss. The possibility of the latter occurring can be reduced by becoming familiar with the applications program and with dBase III. If inadvertent data loss occurs, the backup data base file can be copied to the master disk as follows:

IN dBASE III:

1. COPY FILE d1:FILENAME.EXT TO d2:FILENAME.EXT, where d1 and d2 are the source and destination drives, respectively.

2. The screen will state that the file already exists and will ask if you want to overwrite it. Overwriting will delete the faulty information and store the data from the backup file onto the master disk.

IN DOS:

1. COPY d1:FILENAME.EXT d2:FILENAME.EXT, where d1 and d2 are the source and destination drives, respectively.

2. The screen will state that one file has been copied.

APPENDIX D: UTILITY FILES

PHCODE: Phase of Research

PHCDDE	PHRD
1	Generic Research
2A	Explore Product/Process Innovation and Concepts
2B	Documentation/Theoretical Assessment of System Elements
2C	Laboratory Testing and Evaluation of System Elements
3A	System Engineering Design and Analysis
3B	Detailed Engineering-Scale Design
4A	Design Pilot-Scale Prototype
4B	Build and Test Pilot-Scale Prototype
4C	Evaluate Pilot-Scale Test Results
4D	Design Full-Scale Proof-of-Principle Unit
4E	Build and Test Full-Scale Proof-of-Principle Unit
4F	Evaluate Full-Scale Proof-of-Principle Test Results
5	Demonstration Testing
6	Commercialization

PRCODE: Program

PRG	PRCDDE
BCS	BUILDINGS AND COMMUNITY SYSTEMS
TP	TRANSPORTATION
IP	INDUSTRY PROGRAM
ES	ENERGY STORAGE
EES	ELECTRIC ENERGY SYSTEMS
ECUT	ENERGY CONVERSION AND UTILIZATION TECHNOLOGY

PJCODE: Project Category

PRJCAT	PJCODE
1	Technology R&D
2	Technology Assessment/Feasibility Study
3	Health Effects and Safety Research
4	Technical Support for Rule-Making
5	Program and Policy Planning and Evaluation
6	Energy and Economic Data Development or Analysis
7	Mathematical Model Development
8	Consumer Information on Energy Efficiency (General Public)
9	Technology Transfer/Research Publications (Technical Community)
10	Other

ORCODE: Organization Type

CON	DRC
1	PRIVATE INDUSTRY
2	DOE LABORATORY
3	OTHER FEDERAL ORGANIZATION
4	UNIVERSITY
5	STATE OR LOCAL GOVERNMENT
6	COMBINATIONS OF TYPES
7	TO BE DETERMINED

SPCODE: Subprogram

SUBPRG	SUBCODE
AF	ALTERNATIVE FUELS UTILIZATION
AMD	ADVANCED MATERIALS DEVELOPMENT
AS	APPLIANCE STANDARDS
ATT	ANALYSIS AND TECHNOLOGY TRANSFER
BER	BUILDING EQUIPMENT RESEARCH
BS	BUILDING SYSTEMS
CAB	CATALYSIS AND BIOTECHNOLOGY
CE	CAPITAL EQUIPMENT
COM	COMBUSTION
CS	COMMUNITY SYSTEMS
CT	CONVERSION TECHNOLOGY
EFE	ELECTRIC FIELD EFFECTS
EHV	ELECTRIC AND HYBRID VEHICLES
ES	ENERGY STORAGE
ETD	ELECTROCHEMICAL EXPLORATORY TECHNOLOGY DEVELOPMENT
FEM	FEDERAL ENERGY MANAGEMENT PROGRAM
IC	INDUSTRIAL COGENERATION
IO	IMPLEMENTATION AND DEPLOYMENT
INC	INNOVATIVE CONCEPTS
IPE	INDUSTRIAL PROCESS EFFICIENCY
MAT	MATERIALS
PCS	PHYSICAL AND CHEMICAL STORAGE
PD	PROGRAM DIRECTION
RCS	RESIDENTIAL CONSERVATION SERVICE
RRD	RELIABILITY R&D
ST	SYSTEMS TECHNOLOGY
TBR	ELECTROCHEMICAL TECHNOLOGY BASE RESEARCH
TR	TRIBOLOGY
TSU	TRANSPORTATION UTILIZATION
VP	VEHICLE PROPULSION R&D
WER	WASTE ENERGY REDUCTION

ARCODE: Area

AREA	ACODE
AS	APPLIANCE STANDARDS
BC	BOTTOMING CYCLES
BI	BUILDINGS INNOVATIVE CONCEPTS
BMA	BUILDING MATERIALS
BP	BIOPROCESS ENGINEERING
BR	BUILDING RETROFIT RESEARCH
BSU	BUILDING SUBSYSTEMS
CA	COATINGS AND AOHESIVES
CCT	CONTINUOUS COMBUSTION TECHNOLOGY
CD	CATALYSIS BY DESIGN
CE	COMBUSTION EFFICIENCY IMPROVEMENT
CEP	COMMUNITY ENERGY PLANNING, DEVELOPMENT & MANAGEMENT
CO	COMMINUTION
CP	CARBOTHERMIC PROCESSES
CRM	CORROSION-RESISTANT MATERIALS
CR	CATALYSIS RESEARCH
DE	DESIGN
DHC	DISTRICT HEATING AND COOLING
ECT	ENGINE COMBUSTION TECHNOLOGY
FPR	FEDERAL PLANNING AND REPORTING
HCE	HEATING AND COOLING EQUIPMENT RESEARCH
HMT	HEAT AND MASS TRANSFER
HT	HIGH-TEMPERATURE MATERIALS
IE	IMPROVED EFFICIENCY
IEP	IMPROVED ECONOMIC PERFORMANCE
IER	INDUSTRIAL ENERGY EFFICIENCY IMPROVEMENT PROGRAM
LER	LIGHTING EQUIPMENT RESEARCH
LW	LIGHTWEIGHT MATERIALS
MD	MATERIALS BY DESIGN
MP	MATERIALS PROCESSING
PE	PROCESS ELECTROLYSIS
RCS	RESIDENTIAL CONSERVATION SERVICE
SA	INDUSTRIAL PROGRAM SUPPORT AND ANALYSIS
SB	SEPARATIONS/BENEFICATIONS
SC	SENSORS AND CONTROLS
SG	STANDARDS AND GUIDELINES
SP	SPECIAL PROJECTS
SS	SEPARATION SYSTEMS
TAA	TECHNOLOGY ASSESSMENT AND ANALYSIS
TB	TRIBOLOGICAL MECHANISMS
TC	TOPPING CYCLES
TCP	THERMODYNAMIC CYCLE PROCESSES
TE	TESTING AND CHARACTERIZATION
TGA	TECHNICAL GUIDANCE AND ASSISTANCE
TM	TRIBO-MATERIALS
TT	TECHNOLOGY TRANSFER
WHR	WASTE HEAT RECOVERY

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