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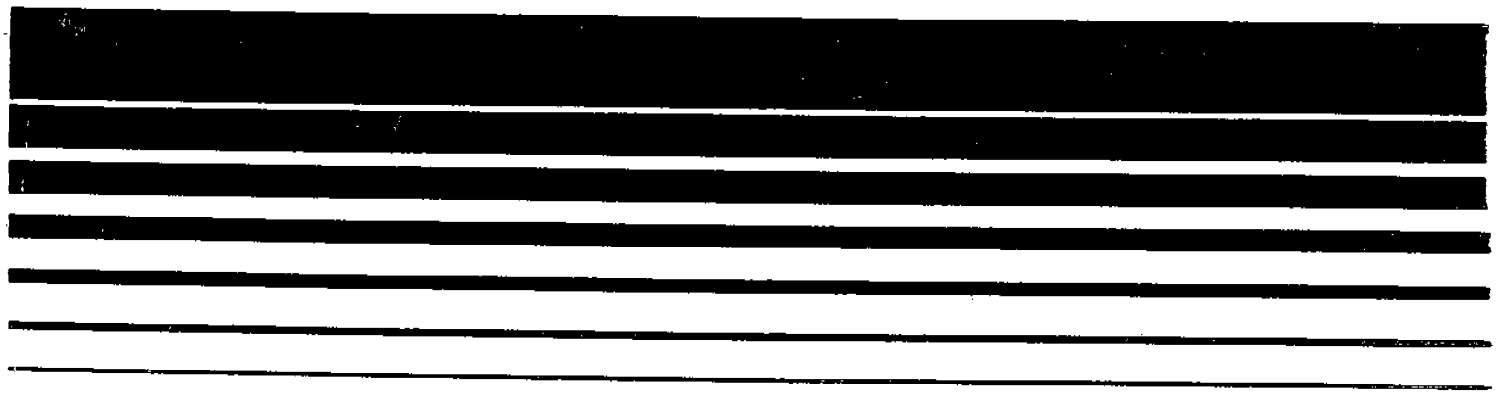
USER'S MANUAL FOR OZIPM-4

(PC VERSION)



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USER'S MANUAL FOR OZIPM-4

(PC VERSION)

By

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Office Of Air Quality Planning And Standards
Office Of Air And Radiation
U. S. Environmental Protection Agency
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ABSTRACT

The OZIPM-4 computer program associated with the Empirical Kinetics Modeling Approach (EKMA) is an acceptable modeling approach for ozone air quality analyses. The OZIPM-4 computer program was developed for use on large mainframe computers. With the advancements in computer technology, many mainframe computer codes such as OZIPM-4 can now be executed on personal desktop computers. This report describes the use of a menu-driven version of the OZIPM-4 designed to run on an IBM PC/XT/AT or true compatible personal computers. Such a system provides an efficient method to develop input files required to execute the OZIPM-4 code. This report serves as a user's guide showing how to use the interactive system. The methods of developing the input files are discussed elsewhere and are not presented in this document.

ACKNOWLEDGEMENTS

The OZIPM-4 interactive system was developed using Turbo Prolog by Borland, Inc. The OZIPM-4 FORTRAN code was compiled using the Microsoft FORTRAN Optimizing Compiler, version 4.1 by Microsoft, Inc. Screen displays used in the OZIPM-4 main program were developed using the SPINDRIFT Library routines by Spindrift Laboratories, Ltd.

Special thanks are given to Dr. Harvey Jeffries of the University of North Carolina for his guidance and recommendations in the development of the interactive OZIPM-4 system.

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FIGURES

1. INTRODUCTION

The OZIPM-4 (Ozone Isopleth Plotting with optional Mechanisms - Version 4) computer program is used to perform EKMA (Empirical Kinetics Modeling Approach) calculations of the VOC (Volatile Organic Compounds) emission reductions needed to reduce ambient ozone levels to the National Ambient Air Quality Standard (NAAQS) of 0.12 ppm. The original OZIPM computer code, written in FORTRAN-IV (EPA, 1987), was intended to be executed on mainframe computers (usually in a batch mode). With the advancements in computer technology, many mainframe computer codes can now be executed on personal computers. The OZIPM computer code is one such code which has been converted to run on IBM compatible personal computers (PCs). Along with the conversion to PCs, an interactive system was developed to provide users of OZIPM-4 a fast and convenient means of preparing and editing input files needed to perform OZIPM-4 calculations. This report describes the use of the interactive OZIPM-4 system on IBM-compatible PCs.

Technical descriptions of the OZIPM-4 computer code and the use of OZIPM-4 are provided in EPA (1987) and Hogo and Gery (1988) and are not provided in this manual. First-time users of OZIPM-4 should read the document titled "User's Manual for Exercising OZIPM4 in Post-1987 O_3 SIP's (Ozone Isopleth Plotting with Optional Mechanisms/Version 4)" (EPA, 1987), before using the PC OZIPM-4 system. Users of the mainframe version of OZIPM-4 should also refer to the EPA (1987) documentation for detailed descriptions of the input options.

This manual is divided into five chapters. The second chapter describes the hardware requirements, startup procedures, and moving around within the OZIPM-4 system. Chapter 3 provides quick-start procedures for users familiar with setting up input files for OZIPM-4. Chapter 3 also serves as a quick summary of the steps to be followed for executing the OZIPM-4 system. Chapter 4 describes the six primary options available in the OZIPM-4 system. Chapter 5 describes methods for running OZIPM-4 and the plotting software without using the editing capabilities of the OZIPM-4 system. This allows the user to run OZIPM-4 in a batch mode for time consuming calculations such as generating isopleth diagrams.

2. INSTALLATION AND STARTUP

System hardware requirements and procedures for installing the OZIPM-4 distribution disks onto the personal computers are presented in this chapter. This chapter also provides a general overview of the OZIPM-4 system and a summary of commonly used keys.

SYSTEM REQUIREMENTS

The OZIPM-4 system is designed to run on any IBM PC/XT/AT or true compatible with a minimum of 512KB RAM memory. Because the OZIPM-4 system requires more than 450KB of RAM memory, many memory-resident programs may have to be removed or not invoked when running the OZIPM-4 main program. The OZIPM-4 system has been run under MS-DOS 3.2 and greater. The OZIPM-4 system requires a hard disk with at least 1MB of free disk space. (The software provided on the three distribution disks occupies about 750KB of disk space.) A math coprocessor is strongly recommended although it is not needed to run the OZIPM-4 system. A system with a math coprocessor will run approximately 5 times faster than a system without the coprocessor. The OZIPM-4 system will run under any of the four common screen displays (monochrome display adapter, MDA; Hercules-compatible monochrome graphics, MGA; color graphics adapter, CGA; and enhanced graphics adapter, EGA). The OZIPM-4 system will also run in several of the video graphics array (VGA) modes. A line printer and/or plotter is desirable but not necessary to generate hardcopy output of OZIPM-4 calculations.

INSTALLATION

The OZIPM-4 system is provided on three distribution disks and are not copy-protected. It is recommended that the three disks be copied onto separate blank formatted diskettes before installing onto the hard disk and saving the original disks as backups.

To copy the OZIPM-4 system to a hard disk, enter the following commands (assuming the drive destination of the hard disk to be C:):

```
C:
CD \
```

```
MD OZIPM4
CD OZIPM4
```

Note: The subdirectory containing the OZIPM-4 software need not be called "OZIPM4" and can be placed on any logical device (e.g., D:, E:, etc.).

Insert the distribution disk labelled "1 of 3" into the floppy drive. Assuming the floppy drive is A:, enter the following commands:

```
COPY A:*.* C:
```

Repeat this procedure for the distribution disks labelled "2 of 3" and "3 of 3".

To invoke the OZIPM-4 system from any place on the hard disk, edit the existing **PATH** statement in the **AUTOEXEC.BAT** file and append "\OZIPM4". Note that the pathname "\OZIPM4 is used only as example. If an **AUTOEXEC.BAT** file is not used, simply type "PATH = \OZIPM4". Refer to the DOS User's Guide for further information on the use of the **PATH** statement and **AUTOEXEC.BAT**. To complete the installation of the OZIPM-4 system, a "FILES=20" and "BUFFERS=20" specification must be set in the **CONFIG.SYS** file. If a **CONFIG.SYS** file already exists (this file can be found at the root directory), then edit the file and include the above statements. If a "CONFIG.SYS" file does not exist, then one must be created in order to use the OZIPM-4 system. To create this file, simply type the following statements:

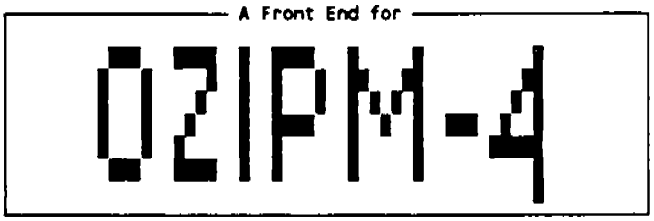
```
CD \
TYPE CON CONFIG.SYS
FILES=20
BUFFERS=20
^Z          (NOTE: this is control-Z)
```

Installation of the OZIPM-4 system is now completed.

STARTUP

To access the OZIPM-4 system, type "OZACCESS" from any location of the hard disk. It is recommended that separate subdirectories be created to store the input and output files developed for the OZIPM-4 system. The OZIPM-4 system will configure itself to access the input and output files in the current subdirectory when the "Directory" option is specified. (See Chapter 4 for more information on the Directory option.)

The OZIPM-4 front-end banner page (Figure 2-1) will appear on the screen while the program is loaded into memory. After the program is loaded into memory, the primary option menu will appear on the screen.



Version 1.30

Written for the Environmental Protection Agency by
Systems Applications, Inc., San Rafael, California

Loading program files

Figure 2-1. Example screen display of the OZIPM-4 front-end banner page.

MOVING AROUND IN THE OZIPM-4 SYSTEM

The primary option menu (shown in Figure 2-2) consists of six options:

Edit	Edit an existing or create a new input file
Load/save	Load or save an input file
Run	Execute the OZIPM-4 program
Plot	Plot isopleth diagrams onto the screen or on a plotter
Directory	Setting the working directory as the default directory
Quit	Exiting the OZIPM-4 system

Access any of the six options by typing the first letter of the option or by using the left and right arrow keys (found on the numeric pad of the keyboard) to position on the desired option and hitting the **ENTER** key.

In general, first-time users of the OZIPM-4 system will perform the following tasks:

1. Create an input file for the OZIPM-4 main program.
2. Run OZIPM-4 to perform a simulation.
3. Edit the existing input file to perform further simulations.
4. Saving the input file.

As seen in Figure 2-2, the primary option menu consists of two banners. The top banner contains the six options. The bottom banner (the Prompt banner) shows a brief message describing the option. With the left and right arrow keys, you can move back and forth between the six options. As you do so, the message on the bottom banner will change accordingly. A reminder of the keys one can use to move around in the OZIPM-4 system is shown at the very bottom of the screen.

KEY DEFINITIONS

The OZIPM-4 system relies on several keys to perform many of its basic functions. This section describes all special keys used in the OZIPM-4 system. Each key is

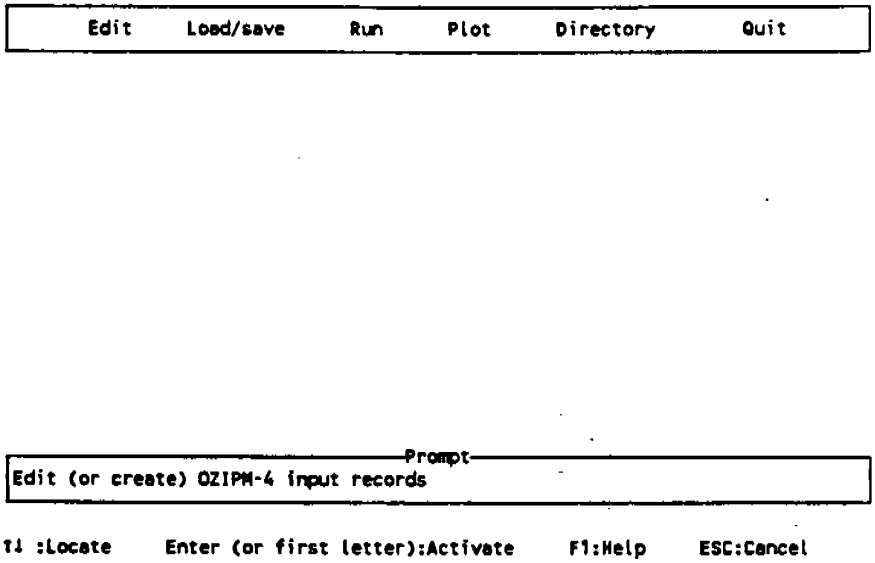


Figure 2-2. Example screen display of the primary option menu.

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defined as follows.

↑↓←→	The up, down, left, and right arrows are used extensively to position the cursor to different locations of the screen.
TAB	The TAB key operates in a similar fashion as the arrow keys within the OZIPM-4 submenus. Use of the TAB key is generally more efficient to move around the various input parameters. Hitting the TAB key will move the cursor forward. Hitting the SHIFT+TAB keys will move the cursor backwards.
ENTER	The ENTER key is used to store an input value in OZIPM-4. **NOTE: The ENTER key must be hit to save the entered value.**
ESC	The ESC (Escape) key is used to leave a submenu of the OZIPM-4 system. Hitting the ESC key will discard any entry made in a submenu.
F1	The F1 key activates the help message system. Help messages will appear on the screen. All help messages can be removed by hitting the SPACEBAR.
F9	The F9 key is used to clear an input option from future use. For example, this key provides a way to erase the EKMA input option if the user wishes to run another option such as the ISOP input option. Use the F9 key only to clear an input option. Do not use this key when an option has not been declared with the F10 key.
F10	The F10 key must be pressed after an input option is created or edited. The entered values will be saved within OZIPM-4 for later processing (either to be saved to a file or to be used in the execution of OZIPM-4).

HELP MESSAGES AND ERROR MESSAGES

The OZIPM-4 system provides on-line help messages for mostly all the different options and parameters within the interactive system. The parameter options are those found in Table 8 of Hogo and Gery (1988). Error messages which may occur are FORTRAN errors which are recorded by the OZIPM-4 system and displayed on the

monitor. Most FORTRAN error messages are self-explanatory. The most common error message will be:

execution error U2253: command failed

This error message indicates that there is not enough memory to execute the program. The user should check to see if enough memory is available to use the OZIPM-4 system by typing **"CHKDSK"**. The amount of free memory must be at least 460KB in order to execute the OZIPM-4 program. Usually memory-resident programs are using the RAM memory and must be unloaded from memory in order to use the OZIPM-4 system. Some memory-resident programs may be unloaded by the user, others are unloaded when the system is powered-off or rebooted. Check the manuals provided with the memory-resident program to determine how to unload the program from memory. An alternate approach is to boot the system from a system floppy diskette which does not contain an **AUTOEXEC.BAT** file which invokes the memory-resident program nor a **CONFIG.SYS** file which contains additional device driver specifications.

3. QUICK START PROCEDURES

This chapter describes several general steps in performing OZIPM-4 calculations. This chapter is intended for users familiar with the mainframe version of OZIPM-4 and serves as a summary of the procedures to follow in performing simple tasks in the OZIPM-4 system. This chapter is not recommended for first-time users. First-time users should read Chapter 4 and explore the various menus provided in the OZIPM-4 system before performing actual EKMA calculations. It is recommended that all users read Chapters 4 and 5 to receive maximum benefits from the OZIPM-4 system. This chapter is divided into seven sections. Each section is presented in a step by step manner.

SETTING THE WORKING DIRECTORY

1. Change directory location to the subdirectory containing the OZIPM-4 input files using the DOS "CD" command.

2. Invoke the OZIPM-4 system by typing "OZACCESS". (Make sure the PATH statement is used.)

3. In the primary option menu, either hit the D key or with the left and right arrow keys move the cursor to the Directory option and hit the ENTER key.

4. Choose the Working option by hitting the ENTER key.

5. Type in the name of the current subdirectory. NOTE: The full pathname including the drive letter should be entered (e.g., C:\MYWORKDR). Hit ENTER to set the working directory.

6. In order for the OZIPM-4 system to use the current subdirectory as the default directory, choose the Save option by hitting the S key or by using the down arrow to position on the Save option and hitting the ENTER key. The OZIPM-4 system will create a file called "OZFRONT.SYS" in the current subdirectory. When the OZIPM-4 system is invoked in the current subdirectory, all pathnames will be defaulted to the current directory. NOTE: An "OZFRONT.SYS" file will be created in every subdirectory which the user desires to perform OZIPM-4 simulations.

CREATING AN INPUT FILE

1. Change directory location to the subdirectory containing the OZIPM-4 input files using the DOS "CD" command.

2. Invoke the OZIPM-4 system by typing "OZACCESS". (Make sure the PATH statement is used.)

3. In the primary option menu, either hit the E key or with the left and right arrow keys move the cursor to the Edit option and hit the ENTER key.

4. Choose one of the 16 available OZIPM-4 input option to create by hitting the appropriate letter (A-P) or by using the up and down arrow keys to position on the desired input option and hitting the ENTER key.

5. Enter the desired values for the input option. Be sure to hit the ENTER key after entering each value. Hit the F10 key when done.

6. Repeat steps 4 and 5 for each input option.

7. After all input options are entered, hit the ESC key to access the primary options.

8. Choose the Load/save option to save the input file or choose the Run option to execute the OZIPM-4 program.

EDITING AN EXISTING INPUT FILE

1. Change directory location to the subdirectory containing the OZIPM-4 input files using the DOS "CD" command.

2. Invoke the OZIPM-4 system by typing "OZACCESS". (Make sure the PATH statement is used.)

3. In the primary option menu, either hit the L key or with the left and right arrow keys move the cursor to the Load/save option and hit the ENTER key.

4. Enter the filename of the input file to be edited or hit the ENTER key to choose the input file to be edit using the arrow keys. Note that the input filename should have the extension ".INP" appended in order to be recognized in the OZIPM-4 system. Also, the OZIPM-4

Load/save and Edit option can only operate on the 16 input options. All other input options are not recognized by the interactive front-end of the OZIPM-4 system and will not be processed for use by the OZIPM-4 program.

5. Hit the ESC key to access the six primary options. Choose the Edit option by hitting the E key or by using the left and right cursor keys to position to the Edit option and hitting the ENTER key.

6. Choose one of the 16 available OZIPM-4 input option to edit (or create) by hitting the appropriate letter (A-P) or by using the up and down arrows to position on the desired input option and hitting the ENTER key.

7. To remove this option from further use, hit the F9 key. To modify an existing value, enter the desired value for the input option. Be sure to erase any trailing nonzero value of the original data before hitting the ENTER key to accept the value. Hit the F10 key when done to accept all values set for the desired input option.

8. Repeat steps 6 and 7 for each input option.

9. After all input options are edited, hit the ESC key to access the primary options.

8. Choose the Load/save option to save the input file or choose the Run option to execute the OZIPM-4 program.

RUNNING OZIPM-4

1. Change directory location to the subdirectory containing the OZIPM-4 input files using the DOS "CD" command.

2. Invoke the OZIPM-4 system by typing "OZACCESS". (Make sure the PATH statement is used.)

3. In the primary option menu, either hit the R key or with the left and right arrow keys move the cursor to the Run option and hit the ENTER key.

4. Before running the OZIPM-4 main program, the user should check each individual input/output filenames for the correct pathnames.

5. Choose the Input option to enter the input filename for the OZIPM-4 run. If the filename is the desired name, then hit the ESC key to return to the primary menu.

6. If the user wishes to use the default output filenames, then skip directly to the Go option. Otherwise, choose the input/output file option to enter the desired filenames.

7. Under the Go option, the OZIPM-4 system will display the input/output files to be used in the OZIPM-4 run. If all filenames are correct, hit "Y" to execute the OZIPM-4 program. Otherwise, hit "N" to return to submenu and modify the appropriate pathnames.

8. The OZIPM-4 program will now be executed. If the user wishes to abort the program, hit the ESC key. If the ESC key is hit the program will discontinue and control will be returned to the OZIPM-4 system. Otherwise, the OZIPM-4 will run to completion.

9. After completion of the OZIPM-4 program, the system will return to the OZIPM-4 primary option menu.

10. Repeat steps 5 through 9 for OZIPM-4 simulations using different input files.

11. After all runs are completed, hit the ESC key to access the six primary options, choose the Quit option to exit the OZIPM-4 system.

RUNNING THE PLOT OPTION

1. Change directory location to the subdirectory containing the OZIPM-4 input files using the DOS "CD" command.

2. Invoke the OZIPM-4 system by typing "OZACCESS". (Make sure the PATH statement is used.)

3. In the primary option menu, either hit the P key or with the left and right arrow keys move the cursor to the Plot option and hit the ENTER key.

4. Choose the Display option to display isopleth diagrams on the monitor or the Plotter option to generate a hardcopy of the isopleth diagrams. Use the up or down arrow keys (or hit the D or P key) to choose the desired option.

5. If the Display option is chosen, type the name of the plot (meta) file to be displayed. This is the file created by OZIPM-4 with the suffix ".mta" as the extension. The plotting program will be executed after hitting the ENTER key.

6. If the Plotter option is chosen, the OZIPM-4 system will display a prompt reminding the user to configure the plotter if necessary. If the plotter needs to be reconfigured, then hit "N" and exit the OZIPM-4 system. Type "PCONFIG" to configure the plotter and repeat steps 1 to 4. At this point, answer "Y" to the reminder prompt. The next display will be a choice of one of the three Hewlett-Packard plotters available for plotting the isopleth diagram. Choose the appropriate plotter using the up or down arrow keys and hit the ENTER key. The plotting program will generate the hardcopy isopleth diagrams.

7. After all isopleth diagrams are generated, control will return to the primary option menu.

8. Repeat steps 1 through 7 for all desired plots.

9. After all plots are generated, hit the ESC key to access the six primary options, choose the Quit option to exit the OZIPM-4 system.

VIEWING AN INPUT OR OUTPUT FILE

1. Change directory location to the subdirectory containing the OZIPM-4 input files using the DOS "CD" command.

2. Invoke the OZIPM-4 system by typing "OZACCESS". (Make sure the PATH statement is used.)

3. In the primary option menu, either hit the L key or with the left and right arrow keys move the cursor to the Load/Save option and hit the ENTER key.

4. Choose the View option to view an input or output file on the monitor The system will ask for the name of the file to view. If the ENTER key is entered without entering a filename, a directory list is produced. Use the arrow keys to position the cursor to the desired file for viewing and hit the ENTER key. Use the page-up or page-down keys to move forward and backwards through the file. A search feature is provided to search for specific information. For instance, the maximum one-hour ozone can be found on an output file generated using the CALCulate option by hitting F3, typing "MAXIMUM", and hitting the F3 key a second time. The OZIPM-4 system will search for the next occurance of the text string "MAXIMUM".

5. After viewing the file hit F10 to return to the primary option menu.

6. Hit the ESC key to access the six primary options, choose the Quit option to exit the OZIPM-4 system.

EXITING THE OZIPM-4 SYSTEM

1. To leave the OZIPM-4 system, hit the ESC key to access the six primary options. Hit the Q key or with the left and right arrow keys position to the Quit option and hit the ENTER key. If any editing was performed during the session and has not been saved, the OZIPM-4 system will display a prompt asking the user if editing changes should be saved or abandoned before exiting the OZIPM-4 system.

4. DESCRIPTION OF THE OZIPM-4 SYSTEM

This chapter describes in greater detail the use of the six primary options available in the OZIPM-4 system. The screen menus displayed for each option are also presented in this chapter. Some general notes on operating the OZIPM-4 system are:

- Help messages are available for most OZIPM-4 options and parameters by hitting the **F1** key.
- Always hit the **SPACEBAR** to exit from a help message.
- The **ESC** key will return the OZIPM-4 to the primary option menu.
- Warm boot the system (using **CTRL+ALT+DEL** keys) should the system hang for any reason.

The six primary options are described in the following sections.

EDIT OPTION

When the Edit option is accessed (either by hitting the **E** key or positioning to the Edit option with the left or right arrow keys) the OZIPM-4 system will display the 16 available input options (see Figure 4-1). The 16 options are described in detail in "User's Manual for Exercising OZIPM4 in Post-1987 O_3 SIP's (Ozone Isopleth Plotting with Optional Mechanisms/Version 4)" (EPA, 1987). Choose the input option to edit by hitting the letter associated with the input option or using the up or down arrow keys to position to the desired input option and hitting the **ENTER** key.

Each of the 16 input options can be edited in a similar manner. Some general operations for each option are:

- Always hit the **ENTER** key after entering a value or the OZIPM-4 system will not retain the new value.
- After all modifications are made to an input option, hit the **F10** key to save the modifications.

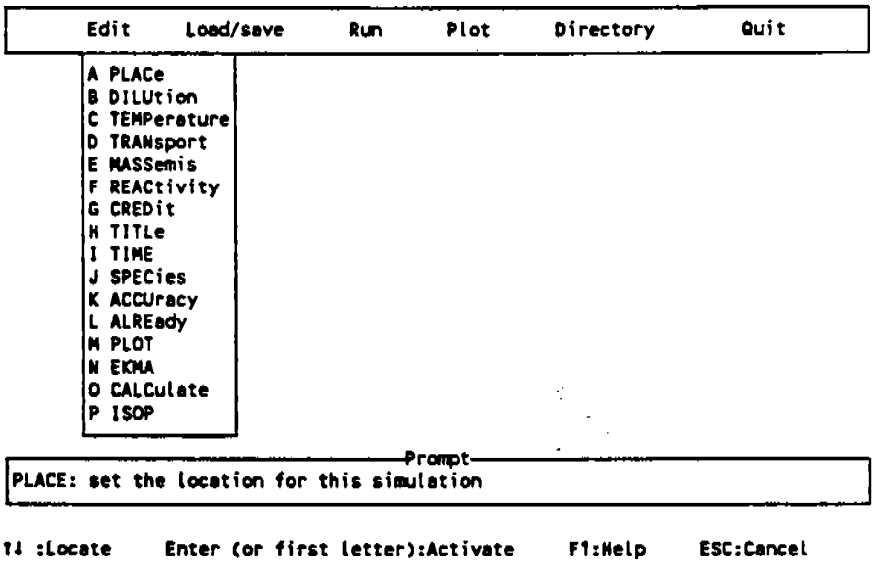

Figure 4-1. Example screen display of the 16 input options available in OZIPM-4.

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- An input option either defined during the current edit session or defined from a previous edit session can be cleared completely from the input file by hitting the **F9** key. The OZIPM-4 system will ask the user to verify that the option is to be cleared. Only use the F9 key to clear options which have been defined. Use the **ESC** key to abort an option which has not been defined.

- The **ESC** key will return to the primary option menu **without** storing any modifications.

- Use the **TAB** and arrow keys to move around the display screen.

- Data values which are not entered will be written to the input file with a value of zero. The OZIPM-4 main program will interpret zeroes as blanks for most parameters. Some input options do interpret zeroes as an actual number. For these input options a value must be entered explicitly even if default values are desired. Check the following subsections to determine where nonzero values must be entered. The data description line usually displays the default value for each input parameters.

- Input options which are not created or specified in the input file will be treated with default values as described in the EPA (1987) document.

- The OZIPM-4 system checks the minimum and maximum allowable values which can be entered in an input option. Although the minimum and maximum values are currently set at extreme values, they are used to insure that negative concentrations are not entered and nonnumeric characters are entered in numeric fields. A value outside of the specified range will be flagged by the OZIPM-4 system and will not be accepted until the user enters a valid value. Similarly, if the user enters a nonnumeric value in a numeric data field, the OZIPM-4 system will notify the user that an invalid value has been entered and will not accept the value.

The display screens for each of the 16 input options contain a top banner describing the input option, a middle section to enter specific data values, a bottom banner section which contains a short description of the data to be entered, and a bottom line describing the key functions (see Figure 4-2 for an example of an input option display screen). The 16 input options are discussed in the following subsections.

PLACe Option

The **PLACe** option can be accessed by hitting the **A** key or by using the up or down arrow keys to position to the **PLACe** option and hitting the **ENTER** key. The **PLACe**

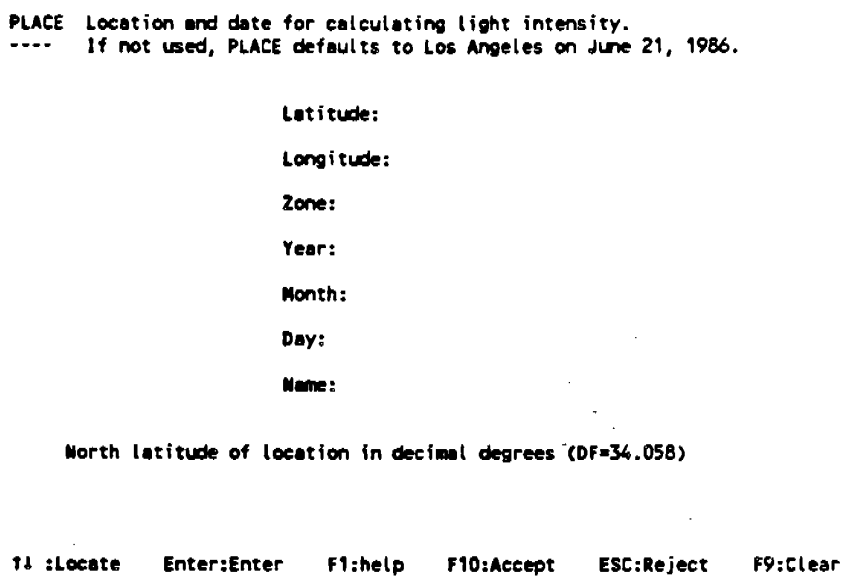

Figure 4-2. Example screen display of the PLACe option menu.

option screen will then be displayed (Figure 4-2). The PLACe input option contains 7 input parameters (latitude, longitude, time zone, year, month, day, and the name of the location to be simulated). When the PLACe option is invoked, the user must enter all seven parameters even when default values are desired.

Note: The time zone can also be entered by hitting the ENTER key before entering a value. Choose the appropriate time zone using the left or right arrow keys.

DILUtion Option

The DILUtion option can be accessed by hitting the B key or by using the up or down arrow keys to position to the DILUtion option and hitting the ENTER key. The DILUtion option screen will be displayed as shown in Figure 4-3. The DILUtion option contains 5 input parameters (initial mixing height, final mixing height, starting time, ending time, and dilution rate before and after the mixing height change). If the DILUtion option is invoked, then the first four parameters must be entered even if default values are desired. Note that in city-specific calculations no dilution is assumed before and after the mixing height change. So, the dilution rate (before and after the mixing height change) parameter is always set to zero. This parameter is in the OZIPM-4 system to provide compatibility will input files developed outside the OZIPM-4 system.

TEMPerature Option

The TEMPerature option can be accessed by hitting the C key or by using the up or down arrow keys to position to the TEMPerature option and hitting the ENTER key. The TEMPerature option screen will be displayed as shown in Figure 4-4. The TEMPerature option contains 1 input parameter (the number of hours with varying hourly temperature values). Upon entering the number of hours which the temperature varies, the display screen will show the data field for entering the temperature values (Figure 4-5). There will be n+1 number of temperature data fields where n is the number of hours. Each temperature value represents the temperature at the beginning of the hour. Thus, the data field labelled "0:" will contain the temperature at start of the simulation.

TRANsport Option

The TRANsport option can be accessed by hitting the D key or using the up or down arrow keys to position to the TRANsport option and hitting the ENTER key. The TRANsport option screen will be displayed as shown in Figure 4-6. The TRANsport option contains 6 main input parameters (surface O_3, aloft O_3, surface NO_2, aloft NO_2, surface NMOC, and aloft NMOC) and 18 data fields for the surface and aloft NMOC reactivities. If non-default NMOC reactivity values are desired, then enter

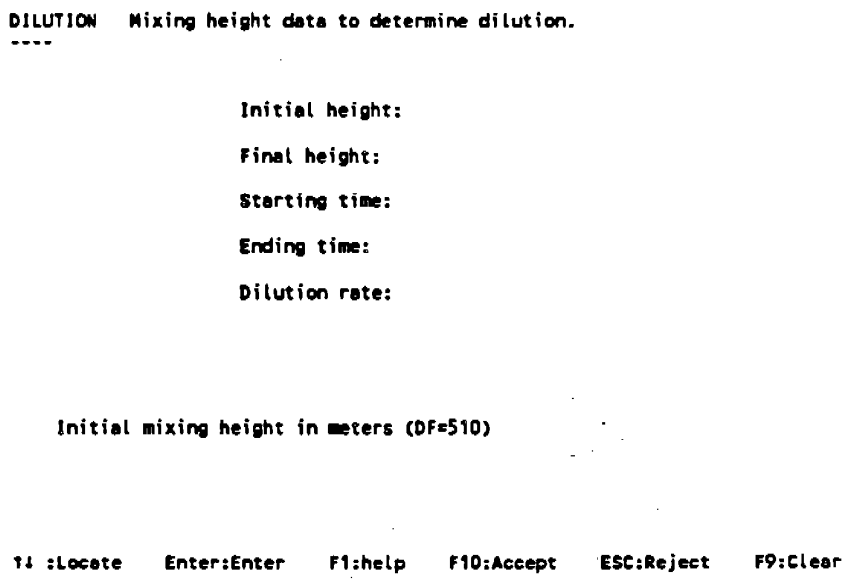

Figure 4-3. Example screen display of the DILUtion option menu.

```
TEMPERATURE  Provides for varying temperatures during the simulation.  If
----         this option is not used, the temperatures default to 303 K.

                              Hours:

     Enter the number of hours of varying temperature (1-24)

↑↓ :Locate    Enter:Enter    F1:help    F10:Accept    ESC:Reject    F9:Clear
```

Figure 4-4. Example screen display of the TEMPerature option menu.

```
TEMPERATURE  Provides for varying temperatures during the simulation.  If
----         this option is not used, the temperatures default to 303 K.

                              Hours: 11


        0:          1:          2:          3:          4:          5:

        6:          7:          8:          9:          10:         11:


          Enter the temperature in degrees Kelvin

↑↓ :Locate    Enter:Enter    F1:help    F10:Accept    ESC:Reject    F9:Clear
```

Figure 4-5. Example screen display of the TEMPerature option menu with the hourly temperature data fields.

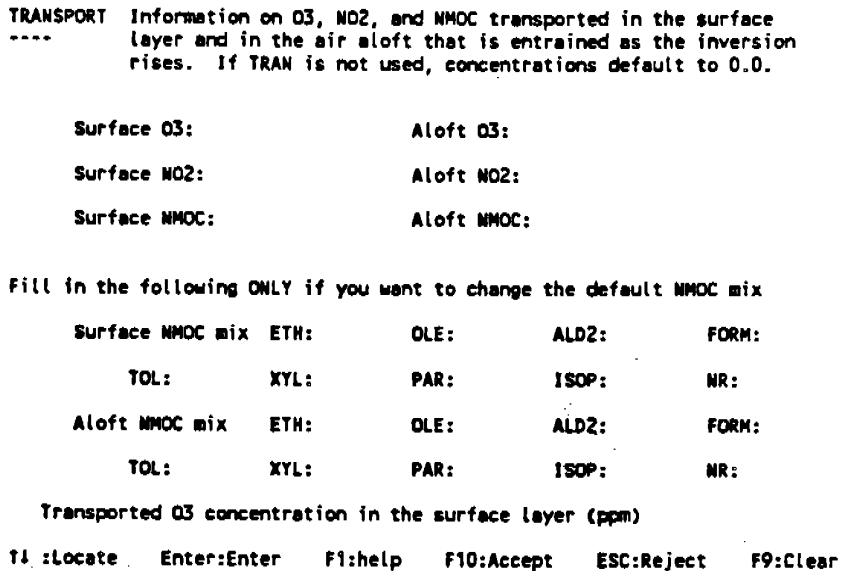

Figure 4-6. Example screen display of the TRANsport option menu.

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the values into the appropriate data field. All reactivity data fields must be entered when one or more reactivity value is entered otherwise the OZIPM-4 system will interpret a blank data field as zero.

MASSemiss Option

The MASSemiss option can be accessed by hitting the E key or by using the up or down arrow keys to position to the MASSemiss option and hitting the ENTER key. The MASSemiss option screen will be displayed as shown in Figure 4-7. The MASSemiss option contains 4 main input parameters (number of hours of emissions, the 0600-0900 NMOC concentration, the 0600-0900 NO_x concentration, and the initial mixing height) and up to 48 data fields for the VOC and NO_x emissions. Blank data fields will be interpreted as zero emissions in the MASSemiss option. Upon entering the number of emission hours the data fields for the emission values will be displayed (see Figure 4-8).

REACtivity Option

The REACtivity option can be accessed by hitting the F key or by using the up or down arrow keys to position to the REACtivity option and hitting the ENTER key. The REACtivity option screen will be displayed as shown in Figure 4-9. The REACtivity option contains 10 input parameters (the initial NO_2/NO_x ratio, and the organic fractions for the 9 Carbon-Bond species). When the REACtivity option is invoked, the user must enter a value for the initial NO_2/NO_x ratio even if the default value is desired. All blanks in the organic reactivity data fields will be interpreted as zero if any nonzero organic fraction is entered.

CREDit Option

The CREDit option can be accessed by hitting the G key or by using the up or down arrow keys to position to the CREDit option and hitting the ENTER key. The CREDit option screen will be displayed as shown in Figure 4-10. The CREDit option contains 7 main input parameters (a defeat option flag, the number of hours of CO emissions, the 0600-0900 CO concentration in the present year, the 0600-0900 aloft CO concentration in the present year, the aloft CO concentration in the future year, and the percent change in CO emissions from the present year to the future year) and up to 24 data fields for the hourly CO emissions. Blank data fields will be interpreted as zero emissions in the CREDit option.

Upon entering the number of emission hours the data fields for the emission values will be displayed (see Figure 4-11). Blanks entered in the emissions data fields will be interpreted as zero. The number of hourly CO emissions can be entered as either a positive or negative value depending on the units of the hourly emissions. If the

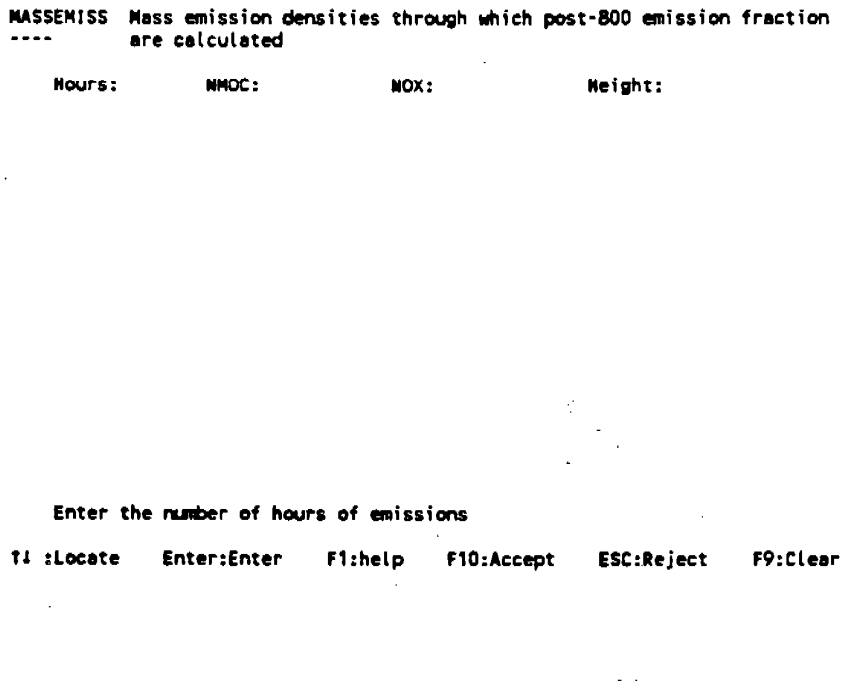

Figure 4-7. Example screen display of the MASSemiss option menu.

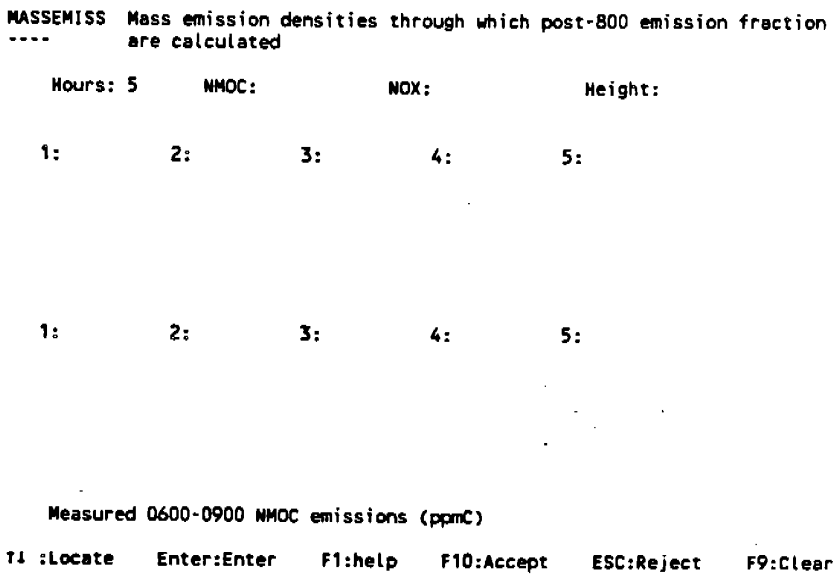

Figure 4-8. Example screen display of the MASSemiss option menu with hourly emission fields.

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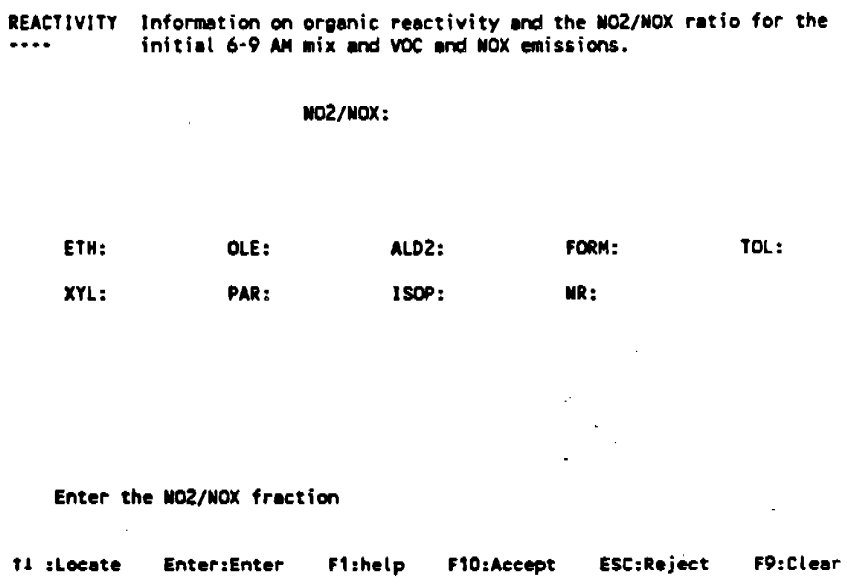

Figure 4-9. Example screen display of the REACtivity option menu.

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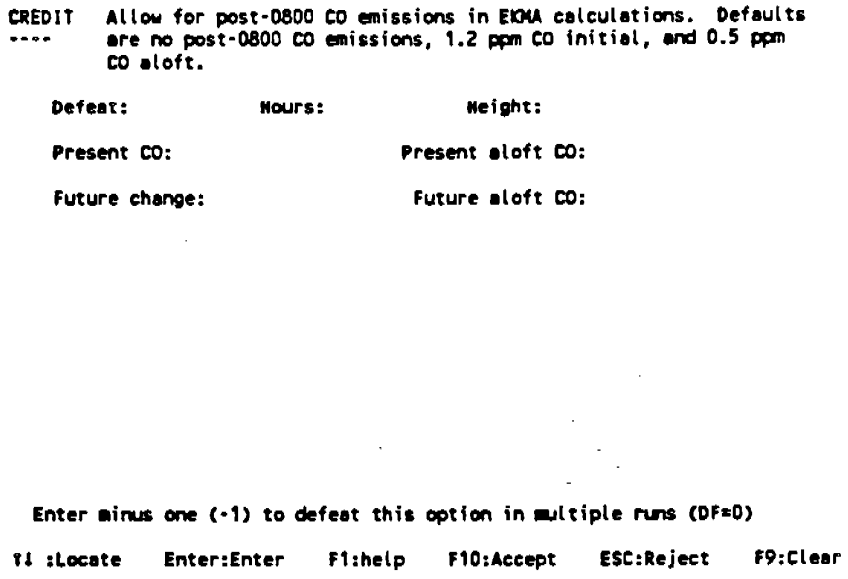

Figure 4-10. Example screen display of the CREDit option menu.

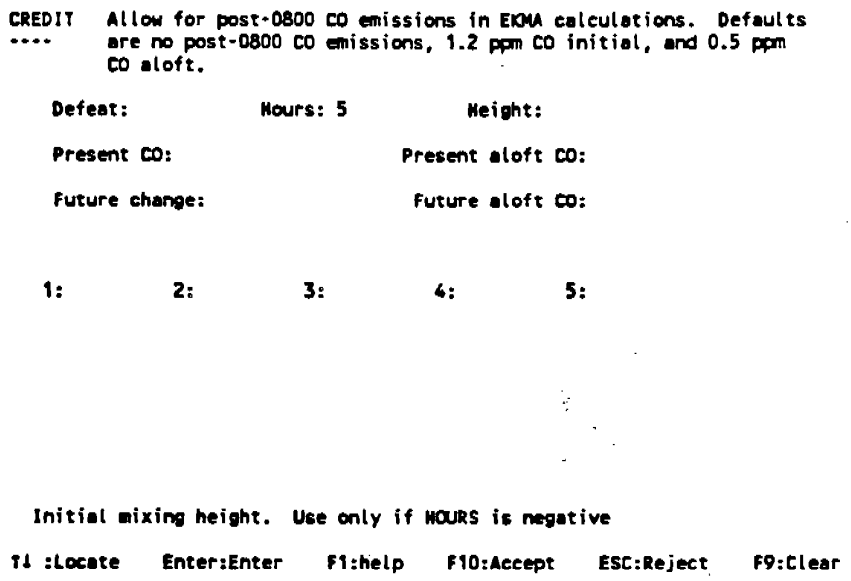

Figure 4-11. Example screen display of the CREDit option menu with the hourly CO emissions data fields.

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users wishes to enter CO emissions as mass densities (units of kg/km^2), then the negative value of the number of hourly emissions should be entered. If the user desires to enter CO emissions expressed as the fraction of the initial 0600-0900 CO concentration, then a positive value of the number of hourly CO emissions should be entered.

The defeat option flag is an option provided in the mainframe versions of the OZIPM-4 program where multiple calculations (either with EKMA, CALCulate, or ISOPleth options) can be performed and the user does not want to invoke the CREDit option for some of the calculations. In general, the defeat option flag will be set to zero when used in the interactive system.

TITLe Option

The TITLe option allows the user to enter a title for the specific simulation and can be accessed by hitting the H key or by using the up or down arrow keys to position to the TITLe option and hitting the ENTER key. The TITLe option screen will be displayed as shown in Figure 4-12. The title is entered in the area specified by the data field.

TIME Option

The TIME option allows the user to specify a simulation time period other than the default time period of 0800 to 1800 LDT. The TIME option can be accessed by hitting the I key or by using the up or down arrow keys to position to the TIME option and hitting the ENTER key. The TIME option screen will be displayed as shown in Figure 4-13. The TIME option contains two data fields: the starting and ending times of the simulation. Both starting and ending times must be entered when this option is invoked. The values should be in military hours (e.g., 1300 LDT is 1 pm in the afternoon local daylight time).

SPECies Option

The user can generate an isopleth diagram for up to five species found in the chemical kinetic mechanism through the use of the SPECies option. The SPECies option can be accessed by hitting the J key or by using the up or down arrow keys to position to the SPECies option and hitting the ENTER key. The SPECies option screen will be displayed as shown in Figure 4-14. The SPECies option contains 5 data fields for the five species of interest. Enter the name of the species of interest in each data field. The OZIPM-4 system will check the spelling of the names entered. If the name does not correspond to a species found in the chemical mechanism, the OZIPM-4 system will alert the user and provide a list of species names. If the user cannot recall the exact name of any species, then hitting the ENTER key displays a list of species names. The cursor will be located on the list of names. With the

```
TITLE   A title for the current simulation.  If not used, TITLE defaults
----    to 'Standard Ozone Isopleth Conditions.'


Title:




↑↓ :Locate    Enter:Enter    F1:help    F10:Accept    ESC:Reject    F9:Clear
```

Figure 4-12. Example screen display of the TITLe option menu.

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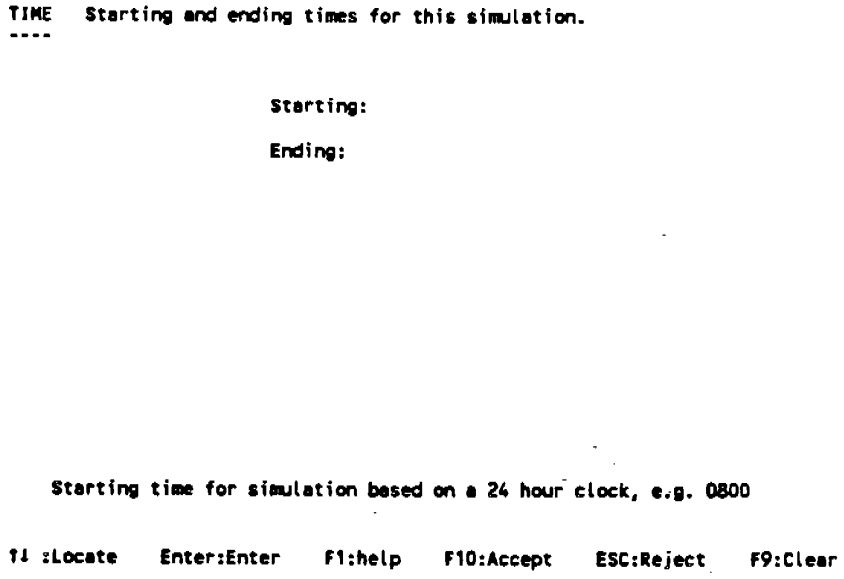

Figure 4-13. Example screen display of the TIME option menu.

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```
SPECIES  Names of 1-5 species for isopleth plots, or concentration profile
----     plots if the CALCULATE option is used.  O3 is the default for the
         SPECIES option.

                        Species 1:

                        Species 2:

                        Species 3:

                        Species 4:

                        Species 5:



      Enter species abbreviation, e.g., O3, or enter blank field for list

↑↓ :Locate    Enter:Enter    F1:help    F10:Accept    ESC:Reject    F9:Clear
```

Figure 4-14. Example screen display of the SPECies option menu.

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arrow keys move the cursor to the species of interest and hit the ENTER key. The species name will automatically be entered into the data field.

ACCUracy Option

The ACCUracy option can be accessed by hitting the K key or by using the up or down arrow keys to position to the ACCUracy option and hitting the ENTER key. The ACCUracy option screen will be displayed as shown in Figure 4-15. The ACCUracy option contains 4 input parameters (error tolerance for the chemical integration scheme, two tension factors for the isolines on an isopleth diagram, and a stop flag to perform simulations up to the ozone peak). Any of the four input parameters may be left blank if desired. The OZIPM-4 main program will interpret blank data fields in this option as default values.

ALREady Option

OZIPM-4 isopleth diagram calculations from a previous computer run can be used to restart OZIPM-4 to complete the isopleth diagram calculation through the use of the ALREady option. The ALREady option can be accessed by hitting the L key or by using the up or down arrow keys to position to the ALREady option and hitting the ENTER key. The ALREady option screen will be displayed as shown in Figure 4-16. The only input parameter required in the ALREady option is the number (positive value only) of simulations performed previously. Unlike the mainframe version of OZIPM-4, the PC version will always read the previous simulations from an external file. The external file will have the extension ".AL1" by default. When the ALREady option is used, the user must rename the current and previous results files as discussed in the section on running the OZIPM-4.

PLOT Option

The PLOT option is used to defined the plot size of the isopleth diagram and the size of the labels on the diagram. The PLOT option can be accessed by hitting the M key or by using the up or down arrow keys to position to the PLOT option and hitting the ENTER key. The PLOT option screen will be displayed as shown in Figure 4-17. The PLOT option contains 5 input parameters (label location, grid type, length of the abscissa, length of the ordinate, size of the isoline labels, and size of the axis labels). The user can enter values other than defaults for any of the five data fields. Blank fields will be interpreted as default values by OZIPM-4.

EKMA Option

The EKMA option is used to calculate VOC control requirements in OZIPM-4. The

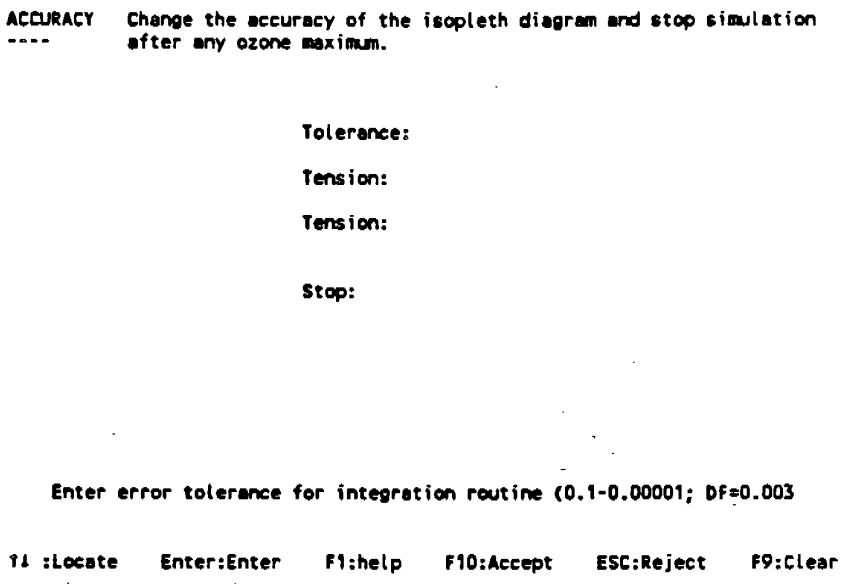

Figure 4-15. Example screen display of the ACCUracy option menu.

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```
ALREADY   Include results from previous simulations.  This front-end assumes
----      that the simulation results will be input from another file.


                          Number:


     Number of previous simulations to be input

↑↓ :Locate    Enter:Enter    F1:help    F10:Accept    ESC:Reject    F9:Clear
```

Figure 4-16. Example screen display of the ALREady option menu.

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```
PLOT   Activates the drawing of the isopleth diagram on an off-line plotter.
----

                        Labels scale:

                        Grid:

                        Abscissa length:

                        Ordinate length:

                        Numbers size:

                        Labels size:

  Scaling factor for location of labels on isopleth (0.1-0.8, DF=0.6)

↑↓ :Locate    Enter:Enter    F1:help    F10:Accept    ESC:Reject    F9:Clear
```

Figure 4-17. Example screen display of the PLOT option menu.

EKMA option can be accessed by hiting the **N** key or by using the up or down arrow keys to position to the **EKMA** option and hitting the **ENTER** key. The **EKMA** option screen will be displayed as shown in Figure 4-18. The **EKMA** option contains 11 main input parameters (base-year ozone, the NMOC/NO_X ratio, the percent change in NO_X emissions, a future year transport flag, an EKMA tabular report flag, a flag to perform an EKMA calculation at a specific NMOC level, 0600-0900 measured NMOC, 0600-0900 measured NO_X, predicted base-year NMOC location, predicted base-year NO_X location, and the specific change in NMOC) and 6 data fields (which are needed only when the transport flag is declared) for the future-year precursor concentrations transported in the surface layer and entrained from aloft.

The input parameters, base-year ozone, the NMOC/NO_X ratio, the percent change in NO_X emissions, the 0600-0900 measured NMOC and NO_X concentrations) must contain nonblank values in the **EKMA** option. All other data fields may contain a blank entry.

CALCulate Option

The **CALCulate** option is used to perform a simulation at a single point on an isopleth diagram. The **CALCulate** option can be accessed by hitting the **O** key or by using the up or down arrow keys to position to the **CALCulate** option and hitting the **ENTER** key. The **CALCulate** option screen will be displayed as shown in Figure 4-19. The **CALCulate** option contains 5 input parameters (the initial NMOC, initial NO_X, a flag to provide detailed output of the simulation, the initial time to print instantaneous concentrations, and the interval to print subsequent instantaneous concentrations). The initial NMOC and NO_X concentrations are the only required input data. The rest of the input data fields may contain blank (or zero) entries if the user desires to use the default values.

ISOPleth Option

The **ISOPleth** option is used to generate isopleth diagrams. The **ISOPleth** option can be accessed by hitting the **P** key or by using the up or down arrow keys to position to the **SPECies** option and hitting the **ENTER** key. The **SPECies** option screen will be displayed as shown in Figure 4-20. The **ISOPleth** option contains 6 input parameters (the maximum 0600-0900 NMOC concentration, the maximum 0600-0900 NO_X concentration, the number of isolines to plot, a flag to print time of peak value and solar noon, the number of species to plot, and an edit flag). Upon entering the number of isolines to plot, the screen will display the appropriate number of data fields to enter the isoline values (Figure 4-21). When more than one species to plot are specified (through the **SPECies** option), the edit flag is used to access the isoline data fields for the different species. For instance, if the user wishes to enter isoline values for the second species to plot, a value of 2 would be entered in the edit flag data field and the data fields will appear in the middle of the screen. To enter

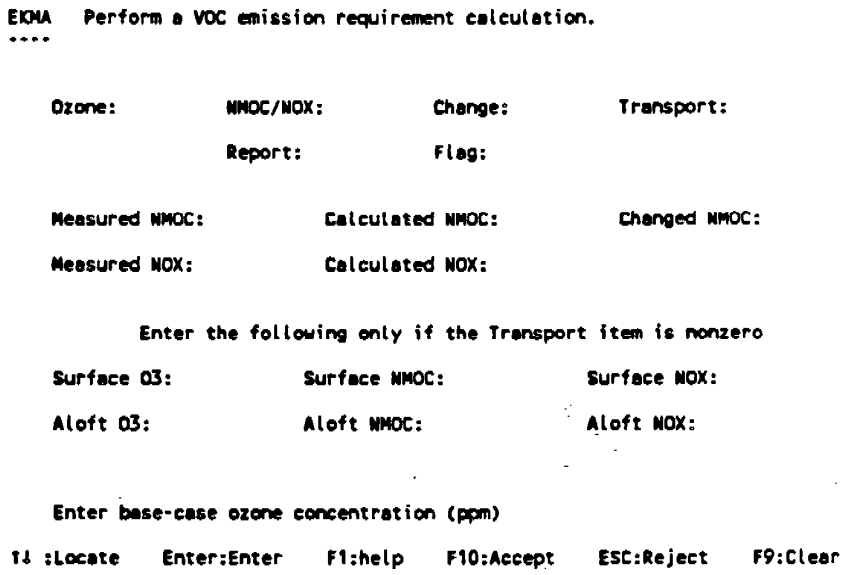

Figure 4-18. Example screen display of the EKMA option menu.

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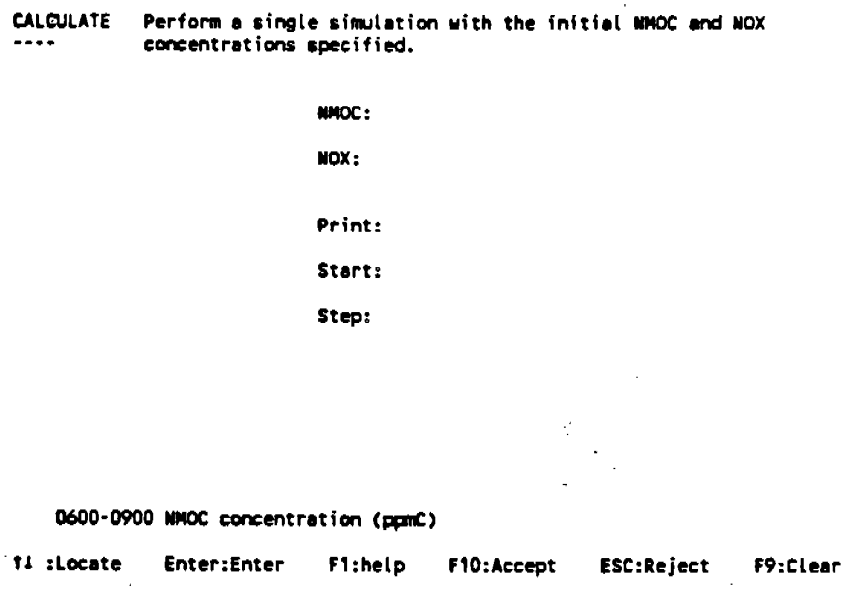

Figure 4-19. Example screen display of the CALCulate option menu.

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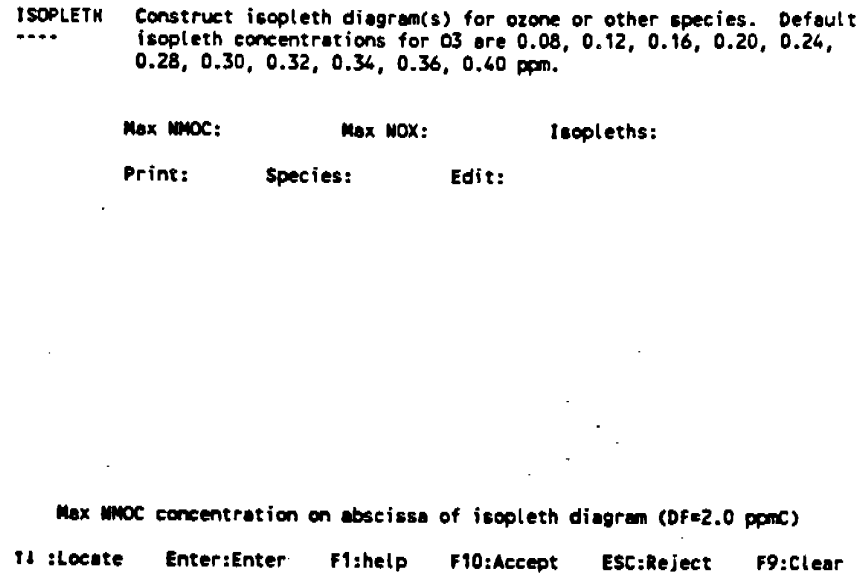

Figure 4-20. Example screen display of the ISOPleth option menu.

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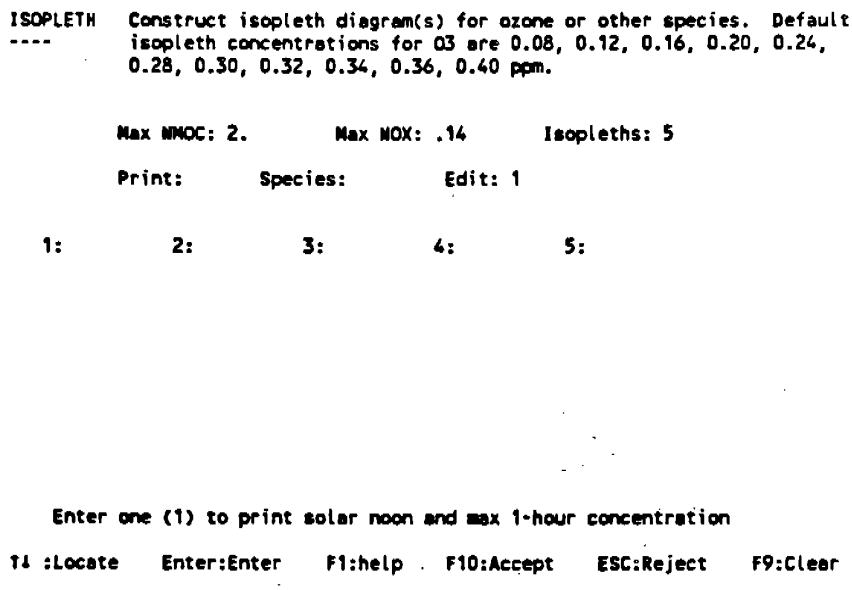

Figure 4-21. Example screen display of the ISOPleth option menu with data fields for the isoline values.

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isoline values for another species, the user would enter the appropriate value in the edit data field. Note that the order of the species to plot must be in the same order as that set in the SPECies option.

LOAD/SAVE OPTION

The Load/save option is used to load an OZIPM-4 input file for editing or execution, save input files for future use, to view a file, and to clear the OZIPM-4 memory to start a fresh session. The display screen for the Load/save option is shown in Figure 4-22. The four operations in the Load/save option are discussed in the following subsections.

Load option

To access the Load option either type the L key or use the up or down cursor key to position on the Load option and hit the ENTER key. Figure 4-23 shows an example of the screen display for the Load option. By default all OZIPM-4 input files will have a filename extension of ".INP". It is recommended that the user follow this convention to organize the various input and output files used in the OZIPM-4 system. To load an existing input file, type the name of the file (without the ".INP" extension) and hit the ENTER key. An alternative method of loading an input file is to hit the ENTER key before typing a name. This will produce a directory list of all files with names ending with ".INP" (Figure 4-24). With the arrow keys, position to the desired input file and hit the ENTER key to load the selected input file.

Save option

To access the Save option either type the S key or use the up or down arrow keys to position on the Save option and hit the ENTER key. Figure 4-25 shows an example of the screen display for the Save option. The display screen for the Save option is similar to the Load option discussed above. If the user wishes to overwrite the original file, then just hit the ENTER key. To save an input file with a different filename, type the name of file to write and hit the ENTER key. An alternative method of saving an input file is to hit the ENTER key before typing a name. This will produce a directory list of all files with names ending with ".INP" (Figure 4-26). With the arrow keys, position to the desired input file and hit the ENTER key to save into the selected input file.

View option

The View option can be used to view an existing file (either an input or an output file). To access the View option either type the V key or use the up or down arrow

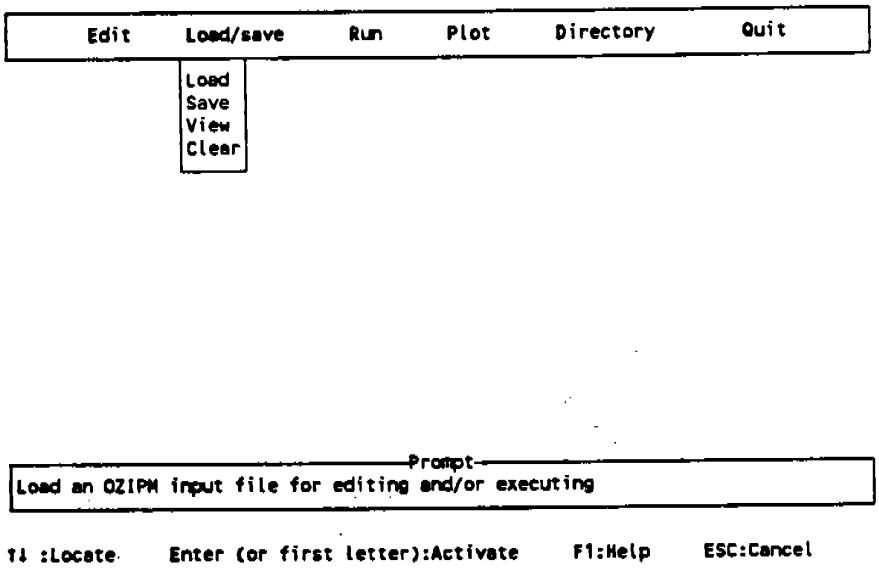

Figure 4-22. Example screen display of the Load/save option menu.

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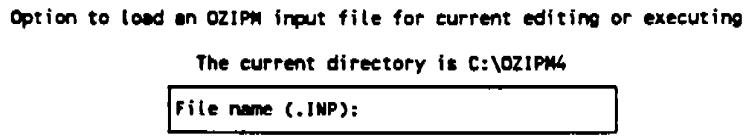

Figure 4-23. Example screen display of the Load option menu.

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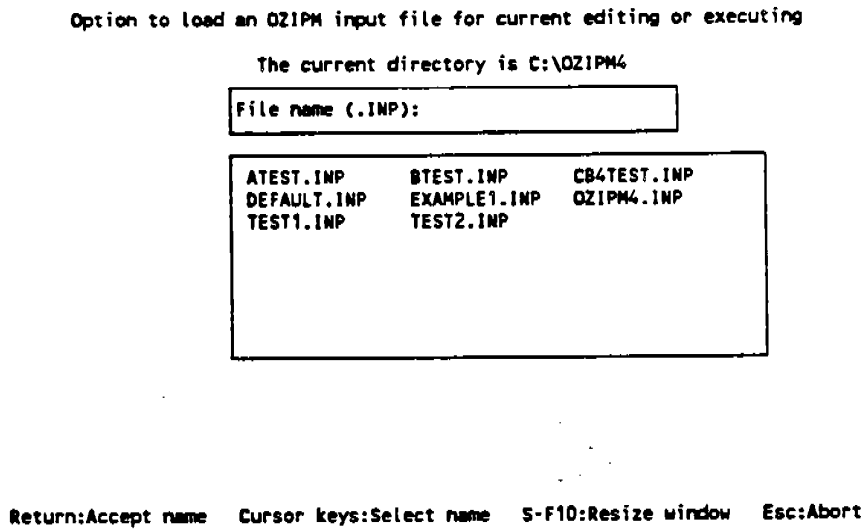

Figure 4-24. Example screen display of the Load option menu with a directory list of the input files.

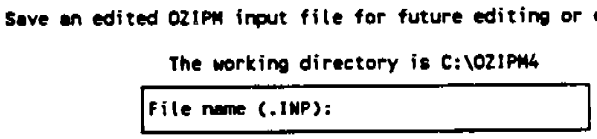

Figure 4-25. Example screen display of the Save option menu.

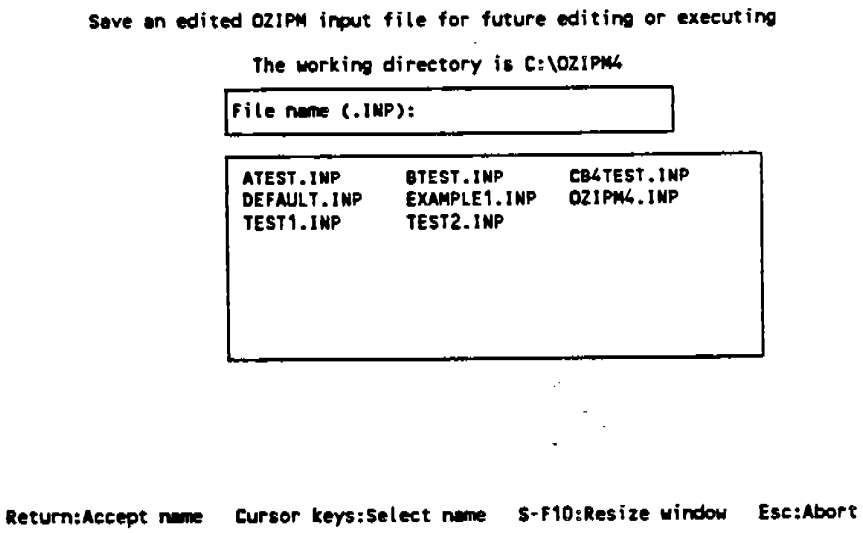

Figure 4-26. Example screen display of the Save option menu with a directory list of the input files.

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keys to position on the View option and hit the ENTER key. Enter the name of the desired file to view. If the ENTER key is hit before typing a filename, a directory list will be produced showing the names of the files in the current directory. With the arrow keys, position to the desired file and hit the ENTER key to select the file. The first 24 lines of the file will be displayed on screen. The Page-up and Page-down keys can be used to move backwards and forwards through the file. The up and down arrow keys will move through the file line by line. The F3 key can be used to search for specific text strings. To search for a string, hit the F3 key followed for the search string. Hitting the F3 key again will begin the search. After viewing the file, hit the F10 key to return to the primary menu.

Clear option

The OZIPM-4 system has the capability to edit multiple sets of input files during a single interactive session through the Load and Save options. After saving an edited input file, the user can clear the memory space to start a new edit session with the Clear option. After clearing the memory space, the user can create a new input file or load an existing input file. To access the Clear option either type the C key or use the up or down arrow keys to position on the Clear option and hit the ENTER key. The memory space will automatically clear. If any edit changes were performed in the current session and the changes have not been saved, the OZIPM-4 system will prompt the user to verify clearing the memory space.

RUN OPTION

Running the OZIPM-4 main program is the heart of the OZIPM-4 system. At this point the user is ready to submit an input file to the OZIPM-4 program and begin EKMA analyses. When the Run option is chosen (either by moving the cursor with the left or right arrow keys or by hitting the ESC key followed by hitting the R key), the screen will display the menu as shown in Figure 4-27. The OZIPM-4 main program requires one input file and as many as five output files to execute. In general, only the input and output files are required. The Run option allows the user to specify the names of the input and output files before executing the main program. To display the names of the input and output files to be used in the run, hit the G key or use the up or down arrow keys to position to the Go option. The names of the input and output files will be displayed as shown in Figure 4-28. If the filenames are correct, then type "Y" to begin execution of the main program. If any names must be modified, then type "N" and choose the filename to modify by hitting the first letter of the option or by using the up or down arrow keys and positioning to the filename to be modified.

Figure 4-29 shows the screen display when the input filename option is chosen. The user would enter the desired input filename and hit the ENTER key. An alternative

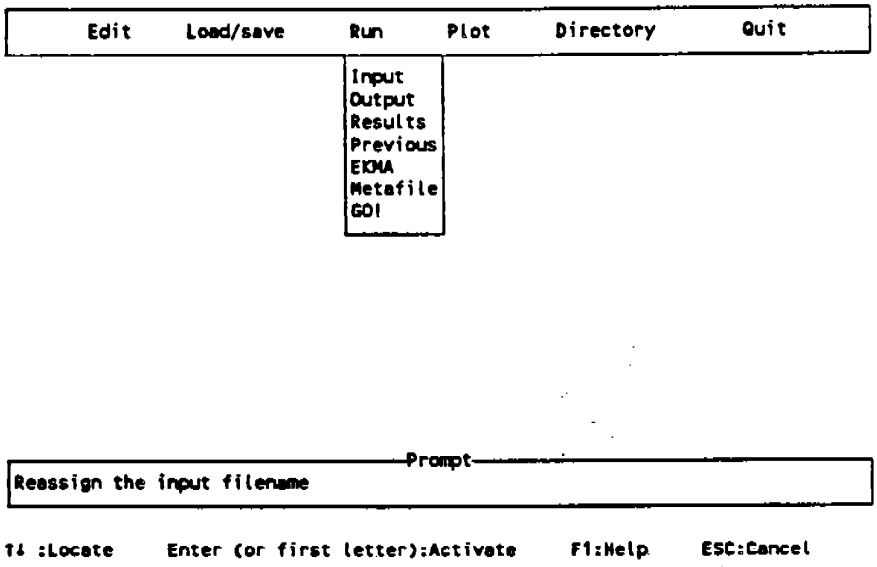

Figure 4-27. Example screen display of the Run option menu.

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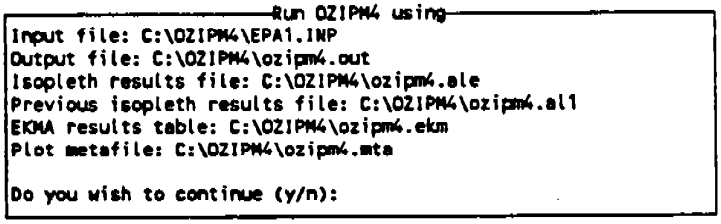

Figure 4-28. Example screen display of the input and output files prompt message.

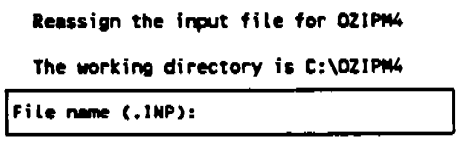

Figure 4-29. Example screen display of the Input filename data field.

method to enter the desired input filename is to hit the **ENTER** key before typing the name. A directory list of the input filenames will be displayed. Use the arrow keys to position to the desired filename and hit the **ENTER** key to accept the selection. Follow the same steps to change the name of the output files.

The three execution options available in OZIPM-4 (**CALC**ulate, **EKMA**, and **ISOP**leth) require different number of output files. All three options require an input file and an output file. However, the **EKMA** option may also require an output file for a tabular report if the tabular report flag is declared. The **ISOP**leth option requires an output file called a "metafile". This file contains the information necessary to draw the isopleth diagram. The **ISOP**leth option also requires the results file. The results file contains the simulation results from an isopleth run. If isopleth simulations results from a previous OZIPM-4 run are to be used, then the name of the file containing the previous results must be specified. When executing OZIPM-4 the default filenames can be used. The user can rename the output files using the DOS "RENAME" command.

When all filenames are selected hit the G key or position to the Go option and answer "Y" to execute the OZIPM-4 program. Typical CPU execution times varies among different PCs. For reference purposes, to execute a single calculation on an IBM PC/XT running at 8 MHz with a 8 MHZ math coprocessor takes about 110 secs. The same computer without a math coprocessor requires over 500 secs. A single calculation on an IBM AT computer running at 6 MHz with a math coprocessor requires about 90 secs. A single calculation on an IBM 386 AT running at 16 MHz with a 16 MHz math coprocessor takes about 26 secs. Typical EKMA calculations requires about 8 to 10 single calculations. Therefore, to perform an EKMA calculation on an IBM PC/XT with a math coprocessor would take about 15 to 20 mins. It takes about 4 to 5 hours to generate an isopleth diagram (which requires 121 single calculations) on an IBM PC/XT running on 8 MHz with a math coprocessor.

As the OZIPM-4 performs the simulation, it will print the current simulation time in minutes from the start of simulation. The time should always be changing. If the simulation time is not progressing, the program has "hung" for some reason. Hit the **ESC** key to abort the run and check the input data for abrupt changes in hourly emissions or temperature, or the simulation time period. Report the problem to the U.S. EPA if the problem persists. When the OZIPM-4 main program finishes executing the input options, the user is prompted to hit any key to return to the menu system. At any time during the execution of the main program, the user may hit the **ESC** key to abort the run. Control will return to the OZIPM-4 system.

PLOT OPTION

The Plot option allows the user to view isopleth diagrams generated from an OZIPM-4 run either on the display screen (if a graphics card is installed) or on an Hewlett-

Packard (HP) pen plotter. A metafile generated from the OZIPM-4 program must be available to use the **PLOT** option. If a metafile has been deleted, it can be recreated using the **ALREady** input option available in the OZIPM-4 system assuming the results file has not been deleted. Load the input file and add the **ALREady** option to the input file using the Edit primary option. Execute the OZIPM-4 main program with Run primary option. Don't forget to check the input and output filenames before executing the OZIPM-4 main program, especially the name of the file containing the previous results. After executing the main program, choose the Plot option by using the left or right arrow keys or hitting the **ESC** key and the **P** key. The Plot menu will be displayed as shown in Figure 4-30.

Display option

To display the isopleth diagrams on the monitor screen, a graphics card must be installed. If one is installed, then hit the **D** key or use the up or down arrow keys to position on the Display option and hit the **ENTER** key. The OZIPM-4 system will for the name of the metafile to be plotted. Enter the name of the metafile leaving off the default extension **".MTA"** if it is used. Upon hitting the **ENTER** key to accept the selected filename, the OZIPM-4 system will execute the plotting program **"OZPLOT"**. Each isopleth diagram will be displayed on the monitor screen. After viewing the isopleth diagram, hit the **ENTER** key to view another diagram if more than one is generated or to return control to the OZIPM-4 system.

Plotter option

The Plotter option allows the user to plot isopleth diagrams on hardcopy pen plotters. Pen plotters currently supported are the Hewlett-Packard 2-pen (model 7470A), 6-pen (model 7475A), and 8-pen (model 7550A) plotters. If the user does not have a pen-plotter attached to the computer, the Plotter option can still be used. The OZPLOT plotting program will prompt the user to save the plot in a diskfile which can be taken to a computer with an attached pen plotter. In either case, before one can generate a hardcopy plot, the system must be configured such that the plotter is attached to the printer port (usually LPT1). Hewlett-Packard pen plotters are generally configured to operate from the serial (or COM) port. So, the COM port must be redirected to LPT1. This can be accomplished using the DOS "MODE" command. To redirect output to LPT1 from a COM port, the following DOS commands must be entered:

MODE LPT1:=COM@: where @ is 1,2,3, or 4, and

MODE COM@:*baudrate*,*parity*,*databits*,*stopbits*,P

where ***baudrate***, ***parity***, ***databits***, and ***stopbits***, are set for the specific computer system. To facilitate entering the above commands, a batch file (called

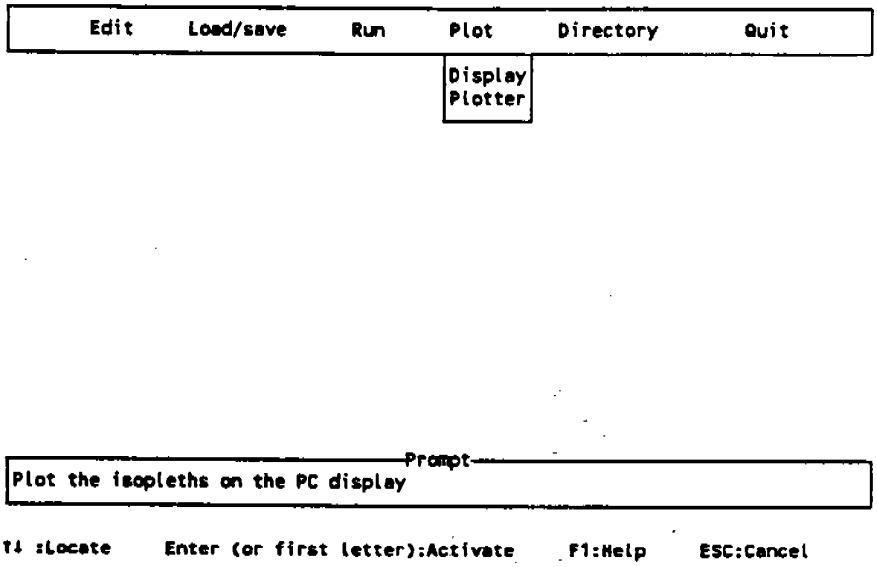

Figure 4-30. Example screen display of the Plot option menu.

PCONFIG.BAT) is provided to automatically redirect the COM port. The settings used in the batch file must be changed for the specific system configuration. Lines 36 and 37 of the batch file can be modified using any text editor such as "EDLIN". To execute the batch file, type "PCONFIG". After the hardcopy plots are generated, reset the redirection by typing:

MODE LPT1:

To generate a hardcopy plot, type the P key or use the up or down arrow key to position to the Plotter option and hit the ENTER key. The user will be warned to verify that the plotter has been appropriately configured before continuing. Type "Y" to continue or "N" to return to the primary option and leave the OZIPM-4 system to configure the plotter. Once the plotter has been configured, return to the OZIPM-4 system and answer "Y" to the warning message. A list of the pen plotters will be displayed on the screen. Choose the appropriate plotter using the up or down arrow keys and hit the ENTER key to accept the selection. Make sure the paper is properly loaded before hitting the ENTER key. The OZPLOT plotting program will be executed and the isopleth diagram will be generated on the pen plotter. After each isopleth diagram has been plotted, hit the ENTER key to either return control to the OZIPM-4 system or to begin plotting the next isopleth diagram.

If the plot is saved in a diskfile, then the file can be copied onto a floppy diskette along with the PCONFIG.BAT file. The floppy diskette is then taken to a computer system with an attached pen-plotter. Follow the instructions for executing PCONFIG.BAT as described above. To plot the file, type "PRINT *filename*". NOTE: This method can only do one plot. Multiple plots invoked with the SPECies options cannot be done using this method. To plot multiple species follow the procedures outlined in chapter 5 on using the OZPLOT program in stand-alone mode.

DIRECTORY OPTION

The Directory primary option sets the current directory as the working directory for the current session. This option can also be used to save the current directory as the default working directory so that future OZIPM-4 session will automatically set the current directory as the working directory. To access the Directory primary option, hit the ESC key followed by the D key or using the left or right arrow keys, position to the Directory option and hitting the ENTER key. The menu as shown in Figure 4-31 will be displayed.

To set the current directory as the working directory, choose the Working option by hitting the W key or by using the up or down arrow key to position on the Working option and hitting the ENTER key. The OZIPM-4 system will prompt for the name of the working directory. Enter the full pathname of the current directory including the drive specification (e.g. C:\MYDIR). This option allows the user to move to

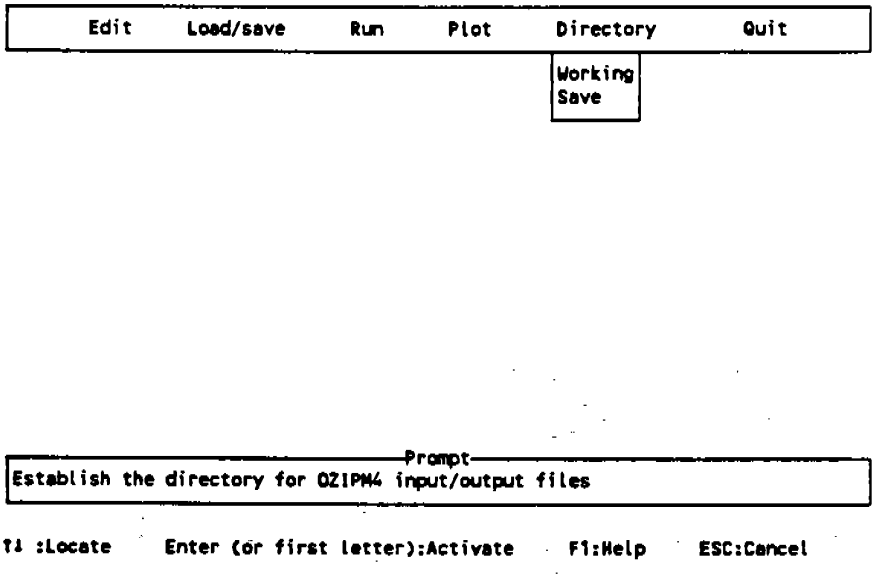

Figure 4-31. Example screen display of the Directory option menu.

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different subdirectories. The working directory is only retained during the current session.

To retain the current directory as the default working directory upon startup of the OZIPM-4 system, choose the Save option by hitting the S key or by using the up or down arrow keys to position to the Save option and hitting the ENTER key. The user will be prompt for the pathname of the current directory to be saved. Enter the full pathname including the drive specification. The pathname will be saved in a file called "OZFRONT.SYS" created in the current directory. This option allows the user to create an "OZFRONT.SYS" file in every subdirectory containing input and output files. Future startup of the OZIPM-4 system in any working directory will automatically set that directory as the default directory.

QUIT OPTION

The Quit primary option is used to exit the OZIPM-4 system. To exit the OZIPM-4 system, hit the ESC key followed by the Q key or use the left or right arrow key to position to the Quit option. If there were no edit modifications performed during the current session, the system will return to the DOS environment. If edit modifications were made to the input file and the input file has not been saved, the OZIPM-4 system will prompt the user for verification that edit changes will not be saved. If the user answers "Y" a second prompt will be displayed to reconfirm the exit. If the user answers N, OZIPM-4 will return to the primary option menu so that the user can save the edited input file.

5. RUNNING OZIPM-4 AND OZPLOT IN "STAND-ALONE" MODE

The previous chapters discussed how to run the OZIPM-4 system in the interactive mode. In some instances, the user may prefer to run the OZIPM-4 main program independent of the interactive program. One example may be the need to submit multiple number of EKMA calculations which may take a total of 3 to 4 hours to execute. Similarly, a pen plotter may not be available on the computer system. Therefore, the OZPLOT plotting program must be executed on another computer system with a pen plotter. This chapter describes how to run the OZIPM-4 main program and the OZPLOT plotting program without accessing the interactive system.

RUNNING OZIPM4

The OZIPM4 executable file "OZIPM4.EXE" can be executed independently by typing (in the current working directory):

OZIPM4 *iofiles1* [BATCH]

The OZIPM-4 main program will be invoked with a file containing the names of the input and output files needed to execute the program. In the above command line, the file *iofiles1* contains the names of the input and output files. Note that *iofiles1* is only a generic name. The structure of the *iofiles1* is as follows:

line 1: pathname or filename of the input file

line 2: pathname or filename of the output file

line 3: pathname or filename of the file containing previous results file (needed only if the ALREady option is used).

line 4: pathname or filename of the file containing the current isopleth results (needed only if the ISOPleth option is used).

line 5: pathname or filename of the plot metafile (needed only if the ISOPleth option is used).

line 6: pathname or filename of the file containing the EKMA tabular report (needed only if the report flag of the EKMA option is set).

The first two lines must be entered, the rest are used only if the stated OZIPM-4 options are invoked. The beginning of each statement must contain a one letter identifier followed by a "=". The one letter identifiers are defined as follows:

I - for the Input file

O - for the Output file

P - for the Previous results file

R - for the file containing new Results

M - for the file containing the plots of the isopleth diagrams.

E - for the EKMA report file

Note that the identifies need not be in uppercase.

The *iofiles1* file can be created using a standard text editor such as "EDLIN". An example of the *iofiles1* would be as follows:

```
i=D:\OZIPM4.INP\TEST1.INP
o=D:\OZIPM4.OUT\TEST1.OUT
p=C:\OZIPM4.RES\TEST1.AL1
r=C:\OZIPM4\TEST1.ALR
E=C:\OZIPM4\TEST1.EKM
m=C:\OZIPM4\TEST1.MTA
```

The above example shows the use of the one letter identifier followed by the pathname of the file. Note in this example that the input file is stored in a different directory than the output file and the results file. The use of an *iofiles1* allows the user to enter a very long pathname if needed.

The second parameter on the OZIPM-4 command line is an optional parameter which will switch off user prompts to end the OZIPM-4 program. One can set up a batch file to execute multiple OZIPM-4 runs without user intervention. By using a standard text editor such as "EDLIN", one can create a batch file *RUN.BAT* with the following lines:

```
OZIPM4 iofiles1 BATCH
OZIPM4 iofiles2 BATCH
OZIPM4 iofiles3 BATCH
```

OZIPM4 *iofiles4* BATCH
OZIPM4 *iofiles5* BATCH

The batch file will execute the OZIPM-4 program five times each time with a different set of input and output files. To execute the batch file, type the batch file name. Such batch files can be setup and executed overnight to provide maximum use of the computer.

RUNNING OZPLOT PLOTTING PROGRAM

The OZPLOT plotting program, **OZPLOT.EXE**, provided on the distribution disks can be executed independent of the interactive system by typing:

OZPLOT *iofiles1* [*plotter device*]

NOTE: Make sure that the plotter has been properly configured with **"PCONFIG.BAT"** before executing the plotting program.

The command line is similar to the OZIPM-4 command line discussed above except that the name (or pathname) of the metafile is entered. The second optional argument tells the **OZPLOT** program the model of the Hewlett-Packard pen plotter to be used:

HP2 - Hewlett-Packard 2-pen (HP-7470A)

HP6 - Hewlett-Packard 6-pen (HP-7475A)

HP8 - Hewlett-Packard 8-pen (HP-7550A)

If a pen plotter is not available on the computer system, the files "OZPLOT.EXE", "PCONFIG.BAT", and the metafiles to be plotted, can be copied to a floppy diskette and taken to a computer system with a pen plotter.

REFERENCES

EPA (1987), "User's Manual for Exercising OZIPM4 in Post-1987 O_3 SIP's (Ozone Isopleth Plotting with Optional Mechanisms/Version 4)", Volumes 1 and 2, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina.

Hogo, H., and M. W. Gery (1988), "User's Guide for Executing OZIPM-4 with CBM-IV or Optional Mechanisms", Volume 1, SYSAPP-88/001, Systems Applications, Inc., San Rafael, California.