



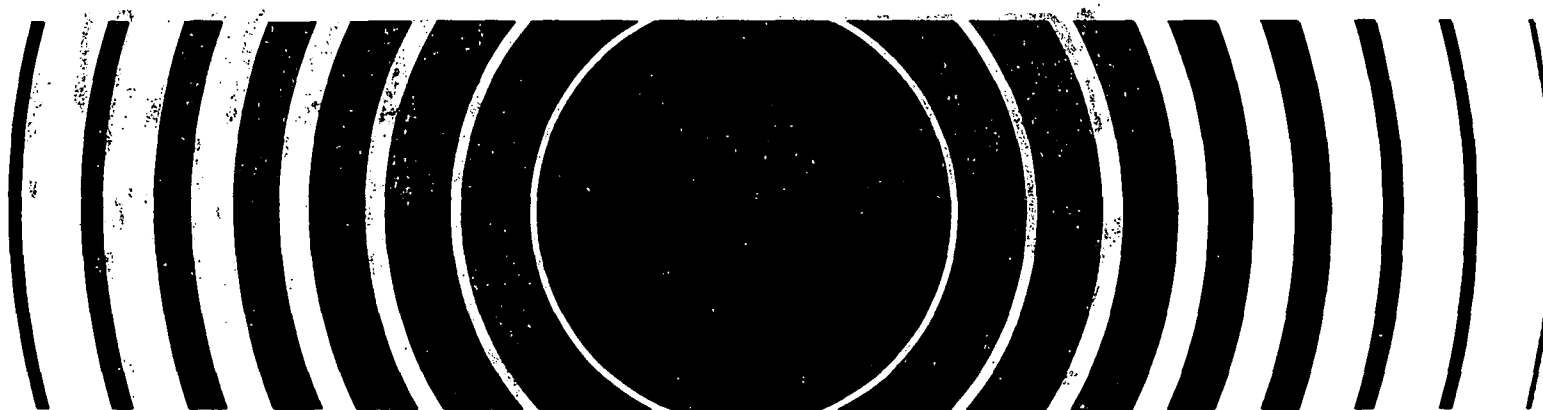
---

Radiation

---

# User's Guide for AIRDOS-PC

## Version 3.0



USER'S GUIDE FOR AIRDOS--PC  
VERSION 3.0

U.S. ENVIRONMENTAL PROTECTION AGENCY  
Office of Radiation Programs  
Las Vegas Facility  
P.O. Box 98517  
Las Vegas, NV 89193-8517

December 1989

## USER'S GUIDE

### TABLE OF CONTENTS

	<u>Page</u>
Figures.....	iii
1. INTRODUCTION.....	1
1.1 Background.....	1
1.2 Purpose.....	1
1.3 AIRDOS-EPA: An Overview.....	2
1.4 Limitations of the AIRDOS-PC Software Package.....	5
1.4.1 Source Term.....	5
1.4.2 Transport.....	6
1.4.3 Doses.....	7
1.5 Hardware Environment.....	8
1.6 User Profile.....	9
1.7 Typographic Conventions.....	9
2. SYSTEM SUMMARY.....	10
2.1 Summary of System Components.....	10
2.2 The Distribution Diskettes.....	11
2.3 Installing the System.....	12
2.3.1 Before Use.....	12
2.3.2 Installation For a High-density (1.2 megabyte) Diskette Drive.....	13
2.3.3 Installation For Two Low-density Diskette Drives.....	15
2.3.4 Hard Disk Installation.....	18
2.4 Initiating the System.....	19
3. SYSTEM OPERATIONS.....	21
3.1 Entering File Names.....	21
3.2 Create and Restore Options.....	22
3.3 Execute Option.....	24
3.4 Quit Option.....	24
3.5 Error Messages.....	25
3.5.1 Errors Produced While Restoring, Creating or Saving a File.....	25
3.5.2 Errors Produced While Executing.....	27
3.6 What to do if Something Goes Wrong.....	30
4. INTERACTIVE SCREENS.....	32
4.1 Common Screen Features.....	32
4.1.1 Predefined Keys.....	32
4.1.2 Entering Data.....	33

4.1.3	Recalling a Value.....	33
4.1.4	Types of Screen Fields.....	33
4.2	Site Parameter Screen.....	36
4.2.1	Screen Summary.....	36
4.2.2	Input Description.....	37
4.3	Release Rate Screen.....	42
4.3.1	Screen Summary.....	42
4.3.2	Input Description.....	43
4.3.3	Deleting an Input Line.....	44
4.4	Report Screen.....	45
4.4.1	Screen Summary.....	45
4.4.2	Report Descriptions.....	46
5.	UTILITIES.....	48
5.1	Summary of the Utility Programs.....	48
5.2	COLORS.....	49
5.2.1	What the Program Does.....	49
5.2.2	Defined Keys.....	50
5.2.3	Using the COLORS Program.....	51
5.3	GETWIND.....	53
5.3.1	What the Program Does.....	53
5.3.2	Program Input.....	53
5.3.3	Program Output.....	55
5.3.4	Using the GETWIND Program.....	55
5.3.5	Error Messages.....	56
6.	TEST CASE.....	58
6.1	Input Screens.....	58
6.2	Sample Reports.....	61
APPENDIX A:	VALID RADIONUCLIDES.....	73
APPENDIX B:	METEROLOGICAL DATA FILES, IDENTIFICATION.....	74
APPENDIX C:	STAR FILE FORMAT.....	76

## USER'S GUIDE

### LIST OF FIGURES

<u>Number</u>		<u>Page</u>
4.2-1	Default Site Parameter Screen.....	36
4.2-2	Stack Source with PLUME RISE = ENTERED.....	38
4.2-3	Wind File Window.....	40
4.2-4	Area Source.....	41
4.3-1	Initial Release Rate Screen.....	42
4.3-2	Example of the Release Rate Screen.....	44
4.4-1	Default Report Screen.....	45
6.1-1	Testcase Site Parameter Screen.....	58
6.1-2	Testcase Release Rate Screen.....	59
6.1-3	Testcase Report Screen.....	60
6.2-1	Meteorological and Plume Parameter Data.....	62
6.2-2	Compliance Report.....	66
6.2-3	Dose Table by Max Distance / Organ.....	68
6.2-4	Dose Table by Max Distance / Pathways.....	69
6.2-5	Dose Table by Max Distance / Nuclide.....	70
6.2-6	Dose Table by Max Distance / Location.....	71
6.2-7	Dose Table for All Distances and All Directions....	72

## USER'S GUIDE

### SECTION 1 - INTRODUCTION

#### 1.1        **BACKGROUND**

On October 31, 1989 the Environmental Protection Agency (EPA) issued final rules for radionuclide emissions to air under 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAPS). Emission monitoring and compliance procedures for Department of Energy (DOE) facilities (40 CFR 61.93(a)) require the use of the CAP-88 or AIRDOS-PC computer models, or other approved procedures, to calculate effective dose equivalents to members of the public.

#### 1.2        **PURPOSE**

This software package is designed to calculate the effective dose equivalent values to maximally exposed individuals, as required by 40 CFR Parts 61.93(a), and to prepare a two-page compliance report suitable for submission to EPA. Organ dose equivalents are also calculated. Additional output tables which are produced by AIRDOS-EPA, but not required for determining compliance, may also be printed.

The assessment scenario is designed to reflect the modeling used by EPA in the Background Information Document prepared for the rulemaking (Risk Assessment Methodology: Draft Environmental Impact Statement for Proposed NESHAPS for Radionuclides, Background Information Document, Volume 2, EPA 520/1-89-0005). A copy of this document may be obtained by writing to the Program Management Office, Office of Radiation Programs (ANR-458), U.S. Environmental Protection Agency, Washington, D.C. 20460, or by calling (202) 475-9610.

### 1.3 AIRDOS-EPA: AN OVERVIEW

AIRDOS-EPA is one component of the CAP-88 computer model specified in 40 CFR 61.93(a). The original AIRDOS-EPA computer code is a methodology, designed for use on IBM-360 computers, that estimates radiation doses to man from airborne releases of radionuclides. The code computes air concentrations, ground surface deposition, and intake rates for the inhalation and ingestion pathways. A modified Gaussian plume equation is used to estimate both horizontal and vertical dispersion of radionuclides released from one to six stacks or area sources.

Radionuclide concentrations in meat, milk, and fresh produce consumed by people are estimated by coupling the output of the atmospheric transport models with the U.S. Nuclear Regulatory Commission Regulatory Guide 1.109 terrestrial food chain models.

Dose conversion factors are input to the code, DARTAB, which estimates doses to individuals at specified distances and directions for selected organs through the following exposure modes: (1) immersion in air containing radionuclides, (2) exposure to ground surfaces contaminated by deposited radionuclides, (3) immersion in water containing radionuclides, (4) inhalation of radionuclides in air, and (5) ingestion of food produced in the area.

The following references on AIRDOS-EPA, DARTAB, and supplementary computer codes are available from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. Phone (703) 487-4650.

ORNL-5532 / PB80147838 AIRDOS-EPA: A Computerized Methodology for Estimating Environmental Concentrations and Dose to Man from Airborne Releases of Radionuclides.

ORNL-5692 / DE81030434 DARTAB: A Program to Combine Airborne Radionuclide Environmental Exposure Data With Dosemetric Health Effect Data to Generate Tabulations of Predicted Health Impact.

ORNL-5952 / DE84016731 PREPAR: A User-Friendly Preprocessor to Create AIRDOS-EPA Input Data Sets.

ORNL-7745 / DE82002486: Estimates of Health Risk From Exposure  
to Radioactive Pollutants.

ORNL/TM-7105: A Combined Methodology for Estimating Dose Rates  
and Health Effects From Exposure to Radioactive Pollutants.

#### 1.4            LIMITATIONS OF THE AIRDOS-PC SOFTWARE PACKAGE

AIRDOS-PC is designed to reflect the modeling used in the NESHAPS Background Information Document mentioned earlier. In order to satisfy this criteria and to allow the code to fit in the memory constraints of a personal computer, a number of options that are available on the mainframe version of AIRDOS-EPA are not available on AIRDOS-PC. Also, there are a number of significant limitations in the original mainframe AIRDOS-EPA code that are also present in AIRDOS-PC. It is important to be aware of the limitations of this code so that it is not used to model a scenario for which it is not appropriate. This section groups the limitations in three categories: source term, transport, and dose calculation.

##### 1.4.1        Source Term

While up to six (6) stacks or area sources can be modeled, all the sources are treated as collocated at the same point. Also, no correction for the errors introduced by building wake effects can be made; so the model is restricted to distances of 300 meters or greater.

Source terms are for annual averages only and cannot be modeled for short-term accidental releases. Only 18 (eighteen) radionuclides can be modeled at a time; however, it is

recommended that lesser numbers be run to decrease execution time.

There is also a restriction on which radionuclides can be modeled with this version. See appendix A for a list of these radionuclides.

#### 1.4.2 **Transport**

Calculations are only done for a circular grid of directions and distances; a square grid option is not available. The code calculates dosage at preselected distances between 300 and 80,000 meters. However, the user has the options of starting the assessment at any distance between 300 and 80,000 meters. This is useful for scenarios where the distance to the nearest individual is known.

Meteorological data for selected sites are supplied for use in the dispersion calculations; however, it is possible to upload user-supplied meteorological data for the calculations. See appendix B for a list of the meteorological data file names and the site each represents.

The food source is assumed to be 100% locally grown. There is no provision for build-up of decay products in soil for the uranium and thorium decay series; this may be included in future

versions. However, the decay product build-up of Cs-137, Ba-140, and Mo-99 is included in this version. The environmental decay constant has been set to 2% per year.

Population assessments are not an option and unique agricultural arrays cannot be supplied. Directions and distances to locations of maximum doses are not supplied in the compliance report.

#### 1.4.3 Health Effects

Calculations for risks or genetic effects are not an option. Dose conversion factors are not available for all combinations of particle size and solubility classes for some radionuclides.

## 1.5        **HARDWARE ENVIRONMENT**

The following is a description of the hardware which will be required to use this software system.

### Computer:

- DOS ( Disk Operating System ) version 2.0  
or higher
- IBM PC, XT, AT or compatible
- 640 kilobytes RAM (500k free)
- parallel communications for a printer
- Intel math coprocessor chip compatible  
with the system \*\*
- Two floppy drives (Two 360k or a 360k  
and a 1.2mb), or a Hard (fixed) disk  
storage system (this is the recommended  
system)

### \*Display:

- Color or monochrome monitor

### Printer:

- Any printer compatible with the system

\*If using a color monitor, the Enhanced Graphics Adapter (EGA) card is recommended (but not necessary) for its higher resolution and color capabilities.

\*\* An error code 4001 will result if a coprocessor is not installed.

## 1.6 USER PROFILE

Users of this package should have some familiarity with personal computers and DOS (Disk Operating System). They should understand basic DOS commands such as DIR (Directory), CD (Change directory), and COPY and know how to format and use diskettes. For more information on these topics consult a DOS user's manual. It is assumed that users have a working knowledge of AIRDOS-EPA. For a list of references on AIRDOS-EPA, refer to pages 3 and 4.

## 1.7 TYPOGRAPHIC CONVENTIONS

Throughout this manual the following conventions are used:

<>: Bold text inside angle brackets signifies a keyboard key. For example, <enter> refers to the return key, <up>, <down>, <left>, and <right> refer to the respective cursor keys on the keyboard.

## SECTION 2 - SYSTEM SUMMARY

### 2.1 SUMMARY OF SYSTEM COMPONENTS

The following is a list of programs in the system and the functions which they provide:

All three of the following make up AIRDOS-PC:

AIRDOSSC.EXE                    -menu driver for AIRDOS-PC, processor  
for user input

ARDOSPC.EXE                    -calculates the air concentrations,  
ground deposition rates, and  
environmental concentrations.

DARTABPC.EXE                   -calculates the maximum dose rates based  
on location of the maximum risk.  
Prints out the compliance report and  
other tables requested.

The following are miscellaneous utilities:

COLORS.EXE                    -allows the user to customize the  
default colors of the input screens.

GETWND.EXE                    -converts user-supplied meteorological  
data into AIRDOS-PC wind formatted  
data.

## 2.2 THE DISTRIBUTION DISKETTES

The distribution diskettes contains the files needed for system operation. Some programs require the presence of special files called support files during operation. Below is a list of the program files, support files, miscellaneous utility files, and data files which are included on the distribution diskettes.

### FILES ON THE DISKETTES

	<u>File name</u>	<u>Required support file</u>
Startup	AIRDOS.BAT	AIRDOSSC.EXE*
Program	AIRDOSSC.EXE	wind file(s)* (all of the wind files end with a file extension of '.wnd'), risk.tog*, dose.tog*, info*, extern.dat*, tmplt.rad*, header*, defaults*, doecity.cat*, ARDOSPC.EXE, DARTABPC.EXE
	ARDOSPC.EXE	specified wind file, airdospc.inp
	DARTABPC.EXE	compli.dat, dartabpc.inp, dartab.inp
Miscellaneous	COLORS.EXE	defaults*
	GETWND.EXE	user-supplied meteorological data file*
Data	SCREEN.INP	
	WIND FILES (All files with .WND extension)	

\* Support file must be on the same diskette if AIRDOS-PC is being run on 1 or 2 diskettes or it must be in the same directory if you're running AIRDOS-PC on a hard disk.

## 2.3        **INSTALLING THE SYSTEM**

### 2.3.1     Before Use

Before using AIRDOS-PC you should, for your own protection, make a backup of all distribution diskettes. You should use the backup that you create and keep the original distribution diskettes in a safe place. If anything happens to the backup you are using you can make another one from the original distribution diskettes. If you desire, all the programs on the distribution diskettes can fit onto one high-density (1.2 megabyte) diskette and the program can be run from this single high-density diskette.

The backup procedure you use depends on the kind of system you have: two-disk system with two low-density (360 kilobytes) diskette drives; two-disk system with one high-density (1.2 megabyte) diskette drive and one 360k floppy diskette drive; or a hard-disk system (this is the recommended system for running AIRDOS-PC). Follow the instructions for your type of system.

It is important to have the following lines in your  
CONFIG.SYS:

Files = 20

Buffer = 20

### 2.3.2      Installation For a High-density (1.2 megabyte)                  Diskette Drive

IF YOU HAVE A TWO-DISK SYSTEM WITH A HIGH-DENSITY (1.2 megabyte)  
DISKETTE DRIVE

    You will need:

        Your DOS diskette

        The original distribution diskettes in your  
        package (2)

        One high-density diskette

All of the files can reside on one 1.2 mb diskette and therefore, the AIRDOS-PC can be run from one diskette. However, care should be taken when running the program from one high-density diskette. Delete any old input files that you are no longer using (they can be copied onto another floppy diskette for future use). If too many accumulate you may not be able to save an input file to the diskette. If this occurs a message will be output informing you of the problem.

You may also customize your startup diskette by deleting any of the wind files that came on your distribution diskettes that you will never use. This will give you more space on the diskette for saving files. All of the wind data files have the file extension '.wnd'. Be careful not to delete any of the program files or their required support files. See Subsection 2.2 for a list of the program files and their required support files.

Format a new 1.2 megabyte diskette or reformat a used 1.2 megabyte diskette. Formatting a used diskette erases any information on it. The diskette to be formatted must be in the high density diskette drive and the DOS diskette must be in the 360k diskette drive. For more information on formatting diskettes refer to your DOS user's manual.

You can now make a backup copy by copying the original AIRDOS-PC diskettes onto the formatted blank diskette. Remove the DOS diskette and make sure the blank formatted high-density diskette is in the high density drive. Copy the two distribution diskettes onto the 1.2 megabyte floppy diskette. Make sure you label the backup diskette you just created. Use this copy to run AIRDOS-PC. For more information on copying files from a diskette onto a another diskette refer to your DOS user's manual.

**WARNING:** If you choose to execute AIRDOS-PC using two low-density (360k) diskettes on a system with both a high-density and a low-density disk drive, be sure too place diskette 1 in the low-density disk drive and make it the default drive. Input files saved by AIRDOS-PC are written to diskette 1, and only low-density disk drives may write to low-density diskettes. Executing AIRDOS-PC with diskette 1 in a high-density drive will result in a write error when an input file is saved. This is not a problem when using the recommended procedure of copying both distribution diskettes to one high-density diskette.

Now, turn to Subsection 2.4.

### 2.3.3 Installation For Two Low-density Diskette Drives

IF YOU HAVE A TWO-DISK SYSTEM WITH TWO LOW-DENSITY (360 kilobyte)  
DISKETTE DRIVES

You will need:

Your DOS diskette

The original distribution diskettes in your  
package (2)

Two low-density diskettes (360 kilobyte)

Format two new or used diskettes; formatting a used diskette erases any information on it. Make sure the DOS diskette is in one drive and the diskette to be formatted is in the other drive. For more information on formatting diskettes refer to your DOS user's manual. After formatting your disks remove the DOS diskette.

You can now make backup copies by copying the original AIRDOS-PC diskettes onto these formatted blank diskettes. Copy the distribution diskette labeled disk 1 of 2 (the startup diskette) to one of the formatted diskettes. Make sure you label this backup diskette so that you know it's the startup diskette. Then copy the distribution diskette labeled disk 2 of 2 to the other formatted diskette and label this diskette also.

The fact that all the files cannot reside on one low-density diskette has several implications. Since several programs

require the presence of support files to operate correctly, it is important that some of the programs and support files reside on the same diskette (reference Subsection 2.2). For example, the file AIRDOS.BAT requires that AIRDOSSC.EXE be present on the same disk. The original distribution diskettes are configured so that the required support files are located on the same diskette as their respective programs with the exception of some of the wind files. The Department of Energy (DOE) site wind files (extension .wnd) are located on distribution diskette 1 of 2 (startup diskette) and are therefore ready to be used. The remaining wind files (extension .wnd) are city files and are located on diskette 2 of 2. Since the city wind files are located on a separate diskette, for a two-disk system you may need to customize your startup diskette. If the wind files that you need to use are on diskette 2, you will need to copy them from diskette 2 to diskette 1 and remove an equal number of DOE wind files. Due to space limitations approximately 30 wind files can reside on the startup diskette. You can always copy additional wind files to the startup diskette as they are needed, but be sure to remove an equal number of wind files. Be sure to leave enough space for any input files you will create during an AIRDOS-PC run.

Use the customized backup copies of diskettes 1 and 2 to run AIRDOS-PC. To assure enough space on your diskettes for the files you may create and save, delete any old input files that you are no longer using (they can be copied onto another diskette

for future use). If too many input files accumulate you may not be able to save an input file to the diskette. If this is the case a message is output informing you of the problem. When deleting wind or input files be careful not to delete any of the program files or their required support files. Refer to Subsection 2.2 for a list of the program files and their required support files.

Now, turn to Subsection 2.4.

#### 2.3.4 Hard Disk Installation

##### IF YOU HAVE A HARD DISK SYSTEM

This is the recommended system for running AIRDOS-PC. Running AIRDOS-PC from your hard disk is much faster than running it from diskettes. Also, storage space for the data files is not as critical as it is on a diskette.

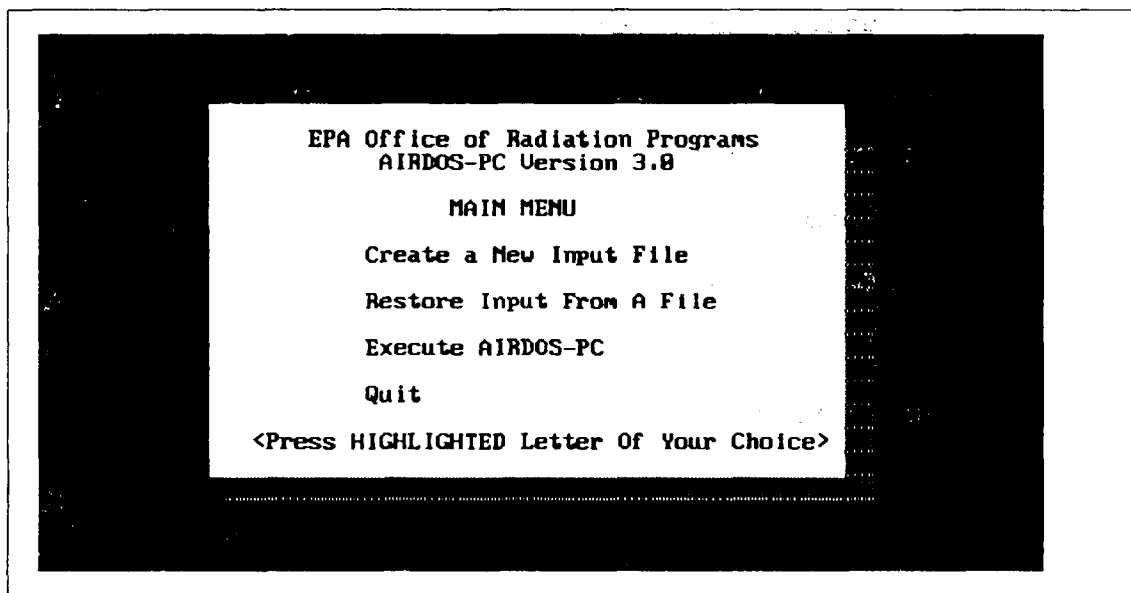
A subdirectory should first be created. Subdirectories let you organize the files on your hard disk in groups. It's a good idea to have a subdirectory that contains just the AIRDOS-PC files. Copy all files from the two distribution diskettes into this subdirectory you've created. For information on creating subdirectories and on copying files from a diskette into a subdirectory, refer to your DOS user's manual.

Now, turn to Subsection 2.4.

## 2.4 INITIATING THE SYSTEM

A program has been provided on the 'Startup' distribution diskette which allows access to the Main menu for using AIRDOS-PC. This file is named AIRDOS.BAT. To access the menu go to the directory in which AIRDOS.BAT is located (on a two disk system with two 360k diskettes it is on the Startup diskette) and type AIRDOS <enter>.

The Main Menu will appear on the screen as follows:



Press the highlighted letter of your choice. To quit the program press <Q>. A short description of each follows. A more complete description can be found in Subsections 3.2 through 3.6.

Create a New Input File: Choose this option to create a new input file for an AIRDOS-PC run. See Subsection 3.2 for more details.

Restore Input from a File: Choose this option to restore a previously saved input file for viewing and/or modification. See Subsection 3.2 for more details.

Execute AIRDOS-PC: Choose this option to run AIRDOS-PC. See Subsection 3.3 for more details.

Quit: Choose this option to exit the program and return to DOS. See Subsection 3.4 for more details.

## SECTION 3 - SYSTEM OPERATIONS

### 3.1 ENTERING FILE NAMES

Create, Restore, and Execute require the specification of a file name for retrieving data and/or saving data. Whenever you are prompted for the name of a file a default file is displayed. The default file is 'SCREEN.INP' if no other file name has been entered or it is the most recently entered file name. If you want to use this default file simply press <enter>. If you want to use another file, type in the name of that file. As soon as you type the first letter of the new file name the default file disappears. You can bring this default file name back by backspacing to the beginning of the file name you are entering.

It is recommended that file naming conventions be established for the three character file extensions. For example, use '.inp' for all input files. For more information on DOS file naming conventions refer to the DOS user's manual.

Press <enter> when you have finished typing in the file name. It is assumed the user knows how to specify a valid DOS file name. If the file name is too long it is truncated to a valid length. For more information on file names refer to your DOS manual.

Choose option (C) to enter all new data for an AIRDOS-PC run, or choose option (R) to restore a previously saved input file for editing. If you are restoring a file you are prompted for the name of the input file you want to restore.

Restoring file  
<ESC> to abort

File name ? **SCREENLINE**

If you don't want to restore a file press <ESC> to abort and return to the Main Menu.

There are three interactive input screens in which data can be entered or edited: Site Parameters, Release Rates, and Reports. See Subsections 4.2, 4.3, and 4.4 for a more complete description of each interactive screen.

When you exit the interactive screens you will be prompted to enter the name of the file where the data will be saved.

Saving to file  
<ESC> to abort

File name ? **SCREEN.INP**

File exists. Do you want to overwrite it ? (Yes/No):

If the name of the file entered already exists, the following message is displayed:

File exists. Do you want to overwrite it? (Yes/No):

Enter <Y> or <y> to overwrite or <N> or <n> if you don't want to overwrite the file (both upper and lower case is acceptable). If you no longer need the data in this file you may want to overwrite it. This will save room on the disk, and it will also be easier to remember the name of your input file if you always use the same name. If you don't want to save the data press <ESC> to return to the Main Menu. If you are restoring an input file and you press <ESC> the old data will not be overwritten.

### 3.3 EXECUTE OPTION

Choose this option (E) to run AIRDOS-PC. You will be prompted for the name of the input file to use.

Execute file  
<ESC> to abort

File name ? SCREEN.INP

If you don't want to execute AIRDOS press <ESC> to abort and return to the Main Menu. Upon completion of the run the user is returned to the main menu. If certain information cannot be found an appropriate error messages is displayed, execution is stopped, and the user is returned to the main menu.

### 3.4 QUIT OPTION

Choose this option (Q) to exit the program and return to DOS.

### 3.5 ERROR MESSAGES

The following is a list of the possible error messages that can be displayed and the reason for each. Whenever an error occurs a beep is emitted and a message is displayed. By default this message is flashing and yellow, but it can be customized to be any color and/or nonflashing (see Subsection 5.2). There are two categories of error messages: errors produced while creating, restoring, or saving a file and those produced while executing. Go to the correct section to find the error message you are looking for.

#### 3.5.1 Errors Produced While Restoring, Creating or Saving a File.

##### **No Radionuclides Entered !!**

If you are saving an input file and no radionuclides have been entered, the above warning message is displayed. You can still save the file but you will not be able to execute AIRDOS-PC with this input file. For more information on entering radionuclides refer to Subsections 4.1.2, 4.3, and to APPENDIX A.

##### **Not a valid AIRDOS-PC file. Hit any key to continue**

If you are restoring an input file and it's not a valid AIRDOS-PC file the above message is displayed. You will not be able to modify or view the file, and you will be returned to the main menu. A valid AIRDOS-PC input file is one that has been created and saved by AIRDOS-PC. A code is embedded in these files. If this code cannot be found it is assumed to be an invalid file. Make sure you have spelled the input filename correctly.

##### **Unable to open file (filename). Hit any key to continue**

If you are restoring an input file and it cannot be found, the above error message is displayed. You will not be able to

restore the file, and you will be returned to the main menu.  
Make sure you have spelled the input filename correctly.

Unable to save [entire] file. Out of DISK SPACE!  
Hit any key to continue.

If you are saving an input file and there is not enough room for the entire file or part of it to be written to disk, the above error message is displayed. If this happens you will need to delete some of your old input files or some of the wind files that you will never use. Be careful not to delete any of the program files or their required support files. Do not delete any files from the original distribution diskettes. Refer to Subsection 2.2 for a list of these files.

ERROR cannot find any wind files.  
Press any key to continue <ESC> to return to main menu.

If you are entering the interactive screens for the first time and no wind files can be found, the above message is displayed. The wind files must be located in the same directory in which you invoked AIRDOS-PC and a wind file must have the extension '.wnd'. If you are generating your own wind files be sure you give them an extension of '.wnd'.

ERROR cannot find the wind file filename that was saved.  
Press any key to continue <ESC> to return to Main Menu.

If you are restoring an input file and the wind file saved in this file cannot be found, the above message is displayed. The wind file has probably been deleted from the directory in which you invoked AIRDOS-PC. You can still restore the input file but the above filename will not be in the selection of wind files to choose from.

ERROR the wind file being restored (filename)  
is not a valid AIRDOS-PC wind file. It cannot be restored.  
Press any key to continue <ESC> to return to Main Menu.

If you are restoring an input file and the wind file specified is not a valid AIRDOS-PC wind file, the above message is displayed. All AIRDOS-PC wind files have a code embedded in them. If this code cannot be found it is assumed to be an invalid file. You can still restore the input file but the above filename will not be in the selection of wind files to choose from.

**WARNING: Cannot find any valid wind files.**  
**Press any key to continue <ESC> to return to Main Menu.**

If you are creating or restoring an input file and none of the files found in the current directory are valid AIRDOS-PC wind files the above message is displayed. All AIRDOS-PC wind files have a code embedded in them. If this code cannot be found then it is assumed to be an invalid file. You will not be able to select any wind files for the wind data and you will not be able to execute with this file until a wind file is specified. You need to copy the original wind files to the directory or diskette that AIRDOS was initiated from.

### 3.5.2 Errors Produced While Executing

**Cannot find file (filename). Execution aborted. Hit any key to continue.**

If the files DARTABPC.EXE or AIRDOSPC.EXE cannot be found the above message is displayed. Execution is stopped and you are returned to the main menu. These files must be present in order to run AIRDOS-PC. If you are running AIRDOS-PC on two 360k diskettes make sure the file mentioned is on one of the diskettes. If you are running AIRDOS-PC from a 1.2Mb diskette make sure the file is on the diskette you are running AIRDOS-PC on. If you are running AIRDOS-PC from a hard disk make sure the file is in the current directory. If the file has been deleted recopy the above file from the original distribution diskettes.

**No Radionuclides in file. Execution aborted. Hit any key to continue.**

If the input file you want to use contains no radionuclides the above message is displayed. Execution is aborted and you are returned to the main menu. There must be at least one radionuclide specified in order to execute AIRDOS-PC. For more information on entering radionuclides see Subsections 4.1.2, 4.3, and APPENDIX A.

**Not a valid AIRDOS-PC file. Execution aborted.**  
**Hit any key to continue.**

If the input file you want to use is not a valid AIRDOS-PC file the above message is displayed. Execution is aborted and you are returned to the main menu. You cannot execute AIRDOS-PC with an invalid input file. A valid AIRDOS-PC input file is one that has been created and saved by AIRDOS-PC. A code is embedded in these files. If this code cannot be found then it assumed to be

an invalid file. Make sure you have spelled the input filename correctly.

**No WIND file specified. Execution aborted. Hit any key to continue.**

If the input file you want to use does not specify a wind file the above message is displayed. Execution is aborted and you are returned to the main menu. You cannot execute AIRDOS-PC without specifying a file that contains wind data. For information on selecting a wind file see Subsections 4.1.4 and 4.2.2.

**\*Printer is out of Paper. Hit any key to continue.**

If the printer connected to your PC is out of paper, the above message is displayed. Execution is aborted and you are returned to the main menu. Put paper in the printer and try executing again.

**\*Printer is not ready. Hit any key to continue.**

If the printer connected to your PC is not ready for printing, the above message is displayed. Execution is aborted and you are returned to the main menu. Check the printer to make sure that it is turned on and on line. Then try executing again.

\*If the printer port has been rerouted to COM1 or COM2, these checks will not indicate any errors, unfortunately.

**Unable to open input/output file (filename). Execution aborted. Hit any key to continue.**

Several input and output files need to be opened for reading and writing to before executing AIRDOS-PC. If an error occurs while opening any of these files the above message is displayed. Execution is aborted and you will be returned to the main menu. Make sure the file displayed is in the current directory. If it's missing, copy the file from the original distribution diskette to the appropriate place for your system.

**ERROR cannot find the wind file filename that was saved. Execution aborted. Hit any key to continue.**

If the wind file specified in the input file you want to use cannot be found the above message is displayed. Execution is aborted and you are returned to the main menu. The wind file has

probably been deleted from the directory in which you invoked AIRDOS-PC.

ERROR invalid wind file ... (filename). Execution aborted.  
Press any key to continue.

If the wind file specified in the input file you want to use is not a valid AIRDOS-PC wind file the above message is displayed. Execution is aborted and you are returned to the main menu. All AIRDOS-PC wind files have a code embedded in them. If this code cannot be found then it is assumed to be an invalid file.

ERROR...CANNOT FIND WIND FILE SPECIFIED. VALUES WILL BE SET TO ZERO

During the process of calculating concentrations the data in the wind file is read. If the file cannot be found the above message is displayed. Execution is not aborted but all values that should have been read in will be set to zero.

ERROR...CANNOT FIND INPUT FILE...EXECUTION ABORTED

If DARTAB or AIRDOS cannot find an input file required, the above message is displayed. Execution is aborted and you are returned to the main menu. If this should happen please contact the U.S. Environmental Protection Agency, Office of Radiation Programs.

ANY ERROR MESSAGES OF THE FOLLOWING FORM:

Error at line # in (some name) Error number #### Called at  
DARTABPC/AIRDOSPC + address

The programs that perform the calculations and generate reports are written in FORTRAN 77 and compiled with Ryan McFarland's PROFORT. If a runtime system error occurs, PROFORT outputs a message in some form of the above. There could be a number of reasons for this type of error to occur. If it does please keep a copy of the input file used for the execution and contact U.S. Environmental Protection Agency, Office of Radiation Programs.

Error 4001 - There is no coprocessor

There must be a Intel math coprocessor chip compatible with the computer system.

**A Program Pauses Indefinitely or Freezes.**

When this situation occurs the program is said to be 'hanging'. There are several reasons why this might occur. The most common cause is trying to print a report when the printer is not ready. The printer must be turned on, on-line, and have paper in it or the program may hang. Although this is checked before starting execution, the printer may accidentally be turned off. DOS usually responds with a message. If this is the case check the printer, fix the problem, and try again.

Another problem occurs when a diskette drive is accessed which has no diskette. In some cases DOS may respond with a message: **Device not Ready (Abort,Retry, Ignore)**. Insert a diskette and press the <R> key (for Retry). A third possible cause is due to undiscovered internal program errors. If the screen freezes a program error has most likely occurred. In any case, if the system is not responding you will probably need to re-start the computer. For more information on starting or 'booting' the computer, see your DOS user's manual.

**The Reports Are Not Output**

This sort of situation may happen. In most cases it is a program error or 'bug'. Usually error messages are displayed before

returning to the main menu. Refer to Section 3.5.2 for the exact message and cause. If the problem was due to a program 'bug', the same input will cause it to reoccur. At this time no known bugs remain in the program; however, it is possible that some may be discovered. If this should occur please make note of all the input field values and contact U.S. Environmental Protection Agency, Office of Radiation Programs.

#### Any Other Unknown Errors

If any other problems occur please make note of all the input field values and contact U.S. Environmental Protection Agency, Office of Radiation Programs.

## SECTION 4 - INTERACTIVE SCREENS

There are three screens that the user can use to enter and select input data for AIRDOS-PC: the Site Parameters Screen, the Release Rate Screen, and the Report Screen.

### 4.1 COMMON SCREEN FEATURES

#### 4.1.2 Predefined Keys

<enter>	moves from one field to the next.
<up>, <down>, <left>, <right>	allows you to move freely around the screen from field to field.

The following keys are displayed and defined at the bottom of each screen:

<Ins>	allows you to change the toggle field values among the preset choices. If its the wind field, it brings up windows of all wind files located in the current directory.
<F1>	allows you to bring up the City Wind Files windows.
<F2>	allows you to bring up the User Wind Files windows if you have created your own wind files.
<F3>	allows you to return to the DOE Wind Files window.
<PgUp>, <PgDn>	allows you to page between the three different screens.
<Esc>	allows you to exit the screens.

#### 4.1.2 Entering Data

To enter data simply type in the correct information for that field and press <enter> or use the arrow keys to move to the next field. Your input is automatically checked for validity as it is being typed. The screens will respond to any erroneous data or keystrokes with a high-pitched error tone.

#### 4.1.3 Recalling a Value

Once you begin entering data in an input field that has a value displayed it erases this value. If you want to bring this value back simply backspace to erase the new data and the old data will appear.

#### 4.1.4 Types of Screen Fields

There are several types of fields. Below is a list of these types and an example of each field type.

##### **Alphanumeric Fields**

These fields contain character strings of alphabetic or numeric characters. Only printable alphanumeric characters may be

entered into these fields. The 'Facility' and 'Name' fields in the Site Parameter Screen are alphanumeric fields.

### **Numeric Fields**

Only numeric data may be entered into these fields. Some numeric fields will only accept integer (non-decimal) numbers. An example of an integer field is 'Phone Number' and 'Zip Code' in the Site Parameter Screen. Other numeric fields will accept integers, decimal numbers, and numbers in valid E notation. An example of this type of field is 'Release Rate' in the Release Rates Screen.

### **Toggle Fields**

A toggle field is a special type of field which contains a list of two or more preset choices. Only one of these choices is displayed in the field. The <Ins> key is used to change the displayed choice. For monochrome monitors the toggle field is highlighted. For color monitors the default for the toggle fields is yellow, but the user can change this. See Subsection 5.2 for more information on changing the colors in the screens. Two examples of toggle fields are the ISOL field in the Release Rate Screen and the wind data file field in the Site Parameter Screen. Once a radionuclide has been specified the ISOL field is displayed. By pressing <Ins> you can display the other valid

ISOL values for that radionuclide. The wind data file field is an example of a special toggle field. Pressing <Ins> causes the first of three possible wind file windows to appear. All of the files in the current directory with the extension '.wnd' are displayed in one of the three possible windows. You can then use the arrow keys to highlight the wind data file of your choice. Press <enter> to select this file and to exit from the window.

\* All units of measurement are toggle fields.

## 4.2 SITE PARAMETER SCREEN

### 4.2.1 Screen Summary

Information on the site and on the person entering the data is input here. Meteorological and stack (or area) data are also input from the this screen. Figure 4.2-1 is the initial Site Parameter Screen showing the defaults for each field. Section 4.2.2 gives a brief description of each input field in the site parameters. Figures 4.2-2 through Figure 4.2-4 are examples of the Site Parameter screen. The toggle fields are highlighted. The alphanumeric and numeric fields will appear as boxed areas on the screen (a different color than the background).

SITE PARAMETERS									
Facility:									
Address:									
City:				State:		Name:			
Zip Code:						Title:			
For Year:						Phone #:			
Comment:									
Distance to Nearby Individuals: (between 300 and 80,000 meters)				Annual Average Temperature:		21	°C		
				Rainfall Rate:		100	cm/y		
Wind Data to Use <INS> for selection:				TEST.WND		Lid Height:	1200	meters	
Source: Stack Count: 6									
Stack Identifier:	01	02	03	04	05	06	07	08	09
Height (meters):	100	150	200	250	300	350	400	450	500
Diameter (meters):	100	150	200	250	300	350	400	450	500
<PLUME RISE>									
BUOYANT (cal/s):	100	150	200	250	300	350	400	450	500
 <Ins> to toggle HIGHLIGHTED fields <Esc> to MAIN MENU      <PgUp> to REPORTS      <PgDn> to RELEASES									

Figure 4.2-1. Default Site Parameter Screen.

#### 4.2.2 Input Description

##### ALPHANUMERIC AND NUMERIC FIELDS

Facility - Name of facility. This field is for the EPA compliance report.

Address, City, State, Zip Code - self-explanatory information on the site. The Zip code can contain a '-' for 9 digit zip codes. All of these fields are for the EPA compliance report.

Year - Year that the radionuclides were emitted into the air. This field is used in the EPA compliance report.

Name, Title, Phone Number - self-explanatory information on the person who prepared the input file for the AIRDOS-PC run. Phone Number is integer only. All these fields are for the EPA compliance report.

Comment - Any comment the user wishes to have printed on the EPA compliance report.

Distance to Nearby Individuals - Starting distance from the source (300 to 80,000 meters). The default value is 300 meters.

Annual Average Temperature - Average air temperature. Only an integer can be entered in this field. The default value is 20 C.

Rainfall Rate - Annual average rainfall rate. Only an integer can be entered in this field. The default value is 100 cm/yr.

Lid - Height of lid; i.e., depth of tropospheric mixing level. Only an integer can be entered in this field. The default value is 1000 meters.

Stack or Area Identifier - Name given to identify each stack, or

area, depending on source chosen. The default values are #1, #2, etc.

Height or Total Area - height of stack if stack source chosen, or total area of each circular source if area chosen. The default value is 10 meters or 10 m\*\*2.

Diameter - Diameter of the stack if stack source chosen. The default value is 0 meters.

Plume Rise (values) - velocity of the stack gases or the heat released from the stack depending on the type of Plume Rise chosen. These values are used to compute the plume rise based on the velocity or on the buoyancy of the stack gases, respectively. The default for each source is 0 m/s or 0 cal/s, respectively.

Pasquill Categories - The specific rise for each Pasquill atmospheric stability category. These values are only entered if

SITE PARAMETERS									
Facility:	[REDACTED]								
Address:	[REDACTED]				Prepared By:				
City:	[REDACTED]			State:	[REDACTED]	Name:	[REDACTED]		
Zip Code:	[REDACTED]				Title:	[REDACTED]			
For Year:	[REDACTED]				Phone #:	[REDACTED]			
Comment:	[REDACTED]								
Distance to Nearby Individuals:	[REDACTED] meters				Annual Average Temperature:	[REDACTED] °C			
(between 300 and 86,000 meters)					Rainfall Rate:	[REDACTED] cm/y			
Wind Data to Use <INS> for selection:	TEST.WND				Lid Height:	[REDACTED] meters			
Stack Identifier:	[REDACTED]	[REDACTED]	[REDACTED]	Source:	Stack	Count:	3		
Height (meters):	[REDACTED]	[REDACTED]	[REDACTED]						
Diameter (meters):	[REDACTED]	[REDACTED]	[REDACTED]						
<PLUME RISE>									
ENTERED (meters):	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Pasquill Categories	A	B	C	D	E	F	G		
<Ins> to toggle HIGHLIGHTED fields <Esc> to MAIN MENU      <PgUp> to REPORTS      <PgDn> to RELEASES									

Figure 4.2-2. Stack Source with PLUME RISE = ENTERED.

ENTERED is chosen for Plume Rise. The default value for each category is 0 meters. See Figure 4.2-2.

#### TOGGLE FIELDS

All Units of Measurements are toggle fields.

Wind Data to Use - File containing AIRDOS-EPA format wind data for a specified area. This is a special toggle field. When the <INS> key is pressed the first of three possible wind file windows appears. The three wind file windows are as follows:

- |                       |   |
|-----------------------|---|
| DEPT. OF ENERGY SITES | This window will normally come up first and lists all the wind files for Department of Energy facilities. Pressing <F3> when in another window will bring back the DOE window.  |
| CITY WIND FILES       | This window can be selected when the <F1> key is pressed. If there are more city files than will fit in one window, the remaining files can be brought to the screen by pressing the <F1> key again.  |
| USER WIND FILES       | This window will only be available if the users supply their own meteorological data in the proper format and use the .wnd extension (reference 5.3 GETWIND). If user files are available this window can be selected when the <F2> key is pressed. |

All of the files that meet the defined file specifications are displayed (all files in the current directory with the extension '.wnd'). The files will be listed alphabetically by file name. You can use the arrow keys to highlight the wind file of your choice. Press <enter> to select the file and exit the window. If the file is not valid a beep is sounded and an appropriate error message will be displayed. The file name will be erased if it's an invalid wind data file. If there are no files that meet

the defined file specifications a beep is sounded and an appropriate message is displayed. The wind file window will not appear. See Figure 4.2-3 for an example of the wind file window.

SITE PARAMETERS																																	
Facility:																																	
Address:																																	
City:	State:	Name:	Prepared By:																														
Zip Code:		Title:																															
For Year:		Phone #:																															
Comment:																																	
Distance to Nearby Individuals: (between 300 and 80,000 meters)		Annual Average Temperature: °C																															
300 meters		Rainfall Rate: cm/y																															
Wind Data to Use <INS> for selection: ABQ0202.WND		Lid Height: 1000 meters																															
<table border="1"> <tbody> <tr> <td>ABQ0202.WND</td> <td>DEN0618.WND</td> <td>PIT1448.WND</td> </tr> <tr> <td>AGS1018.WND</td> <td>ERI0610.WND</td> <td>SAF1184.WND</td> </tr> <tr> <td>ALB0523.WND</td> <td>HTS0019.WND</td> <td>SUU0316.WND</td> </tr> <tr> <td>ALO0729.WND</td> <td>LEA0435.WND</td> <td>TPA0662.WND</td> </tr> <tr> <td>AMA0621.WND</td> <td>MDW0675.WND</td> <td>TYS1328.WND</td> </tr> <tr> <td>BDL1262.WND</td> <td>MJH0486.WND</td> <td>UCC1026.WND</td> </tr> <tr> <td>BUR1051.WND</td> <td>OAK0319.WND</td> <td></td> </tr> <tr> <td>CMH0243.WND</td> <td>ORD0452.WND</td> <td></td> </tr> <tr> <td>CUE0403.WND</td> <td>PAH0479.WND</td> <td></td> </tr> <tr> <td>DAY1502.WND</td> <td>PIH0359.WND</td> <td></td> </tr> </tbody> </table>				ABQ0202.WND	DEN0618.WND	PIT1448.WND	AGS1018.WND	ERI0610.WND	SAF1184.WND	ALB0523.WND	HTS0019.WND	SUU0316.WND	ALO0729.WND	LEA0435.WND	TPA0662.WND	AMA0621.WND	MDW0675.WND	TYS1328.WND	BDL1262.WND	MJH0486.WND	UCC1026.WND	BUR1051.WND	OAK0319.WND		CMH0243.WND	ORD0452.WND		CUE0403.WND	PAH0479.WND		DAY1502.WND	PIH0359.WND	
ABQ0202.WND	DEN0618.WND	PIT1448.WND																															
AGS1018.WND	ERI0610.WND	SAF1184.WND																															
ALB0523.WND	HTS0019.WND	SUU0316.WND																															
ALO0729.WND	LEA0435.WND	TPA0662.WND																															
AMA0621.WND	MDW0675.WND	TYS1328.WND																															
BDL1262.WND	MJH0486.WND	UCC1026.WND																															
BUR1051.WND	OAK0319.WND																																
CMH0243.WND	ORD0452.WND																																
CUE0403.WND	PAH0479.WND																																
DAY1502.WND	PIH0359.WND																																
<F1> CITY FILES		<ENTER> to select a file																															
		<F2> USER FILES																															

Figure 4.2-3. Wind File Window.

Source - STACK for point-source atmospheric dispersion calculations. AREA for a uniform circular area source. The default is stack, source. See Figure 4.2-4 for an example of an AREA source.

Count - Number of stacks or release areas. The default is 6. Figures 4.2-1, 4.2-2, and 4.2-4 are examples of different counts.

Plume Rise (type) - the equation to use for calculating plume rise is based on the method in which the gases rise above the stack or roof vent. There are three different methods to choose from:

1. ENTERED - the user supplies his own values for the specific rise for each Pasquill atmospheric stability category.
2. MOMENTUM - plume rise is computed for the momentum type emissions using Rupp's equation.
3. BUOYANT - plume rise is computed for buoyant plumes using Briggs' equations. This is the default.

See AIRDOS manual for reference.

SITE PARAMETERS			
Facility:			
Address:		State:	Prepared By:
City:		Name:	
Zip Code:		Title:	
For Year:		Phone #:	
Comment:			
Distance to Nearby Individuals:	Annual Average Temperature:	24	°C
(between 300 and 80,000 meters)	meters	Rainfall Rate:	100 cm/y
Wind Data to Use <INS> for selection:	TEST.WND	Lid Height:	1000 meters
Area Identifier:	Source:	Area	Count: 2
Total Area (n**2 ):			
<p>&lt;Ins&gt; to toggle HIGHLIGHTED fields            &lt;Esc&gt; to MAIN MENU      &lt;PgUp&gt; to REPORTS      &lt;PgDn&gt; to RELEASES</p>			

Figure 4.2-4. Area Source.

#### 4.3.1 Screen Summary

RELEASE RATES (Ci/y):

RADIO NUCLIDE	CLASS	AMAD	#1	#2
[REDACTED]				

<Ins> to toggle HIGHLIGHTED fields  
<Esc> to MAIN MENU      <PgUp> to SITE PARAMETERS      <PgDn> to REPORTS

42

#### 4.3.2 Input Description

**Radionuclide:** Name of the nuclide emitted, i.e., U-234. A total of 18 radionuclides can be entered per run.

**Class:** Solubility class for the nuclide entered, i.e., D = days; W = weeks; Y = years; \* = gas. This is a toggle field.

**Amad:** Activity median aerodynamic diameter of nuclide. There are four possible values: 0.0, 0.3, 1.0, and 3.0. This is a toggle field.

**Release Rates:** Release rate of radionuclides from the stack or area. The default is 0 Ci/y.

- \*NOTE:
1. The toggle values of CLASS and AMAD depend on the radionuclide entered. The user will be able to toggle and select only the values valid for that particular nuclide.
  2. The defaults for CLASS and AMAD also vary depending on the radionuclide entered. The CLASS default is the nuclide's clearance class. The AMAD default is 1.0 if the nuclide is not a gas or 0.0 if the nuclide is a gas.
  3. For CS-137, BA-140, and MO-99, their daughters (BA-137M, LA-140, and TC-99M, respectively) and their build-up factors will be included automatically. CLASS and AMAD will be set to their respective defaults. User specified daughters will be considered parent nuclides.
  4. If an invalid radionuclide is entered, a beep is sounded. See appendix A for a list of valid radionuclides.

#### 4.3.3 Deleting an Input Line

If you've made a mistake and want to delete an entire line of input, position the cursor in the radionuclide name field and press:

space bar followed by <enter>.

RELEASE RATES (Ci/y):				
RADIO NUCLIDE	CLASS	AMAD	#1	#2
TH-234	W	3.		
U-235	*	0.		
U-238	Y	1.		

<Ins> to toggle HIGHLIGHTED fields  
<Esc> to MAIN MENU      <PgUp> to SITE PARAMETERS      <PgDn> to REPORTS

Figure 4.3-2 Example of the Release Rate Screen.

#### 4.4 REPORT SCREEN

##### 4.4.1 Screen Summary

The reports the user wants output are selected from this screen. All reports go directly to the printer. Figure 4.4-1 is the initial report screen with the default for each option. The default is "N" for all of the reports except the Compliance Page which is always printed. Subsection 4.4.2 describes each report. Section 6.2 has examples of the reports for the test case (Figures 6.2-1 through 6.2-7). The print field is a toggle field and is highlighted.

REPORTS	
	PRINT (Y/N) ?
Meteorological and Plume Parameter Data	N
Dose Table by Max Distance / Organ	N
Dose Table by Max Distance / Pathways	N
Dose Table by Max Distance / Nuclide	N
Dose Table by Max Distance / Location	N
Dose Table for All Distances and All Directions	N
Compliance Page will be printed	
<Ins> to toggle HIGHLIGHTED fields	
<Esc> to MAIN MENU	<PgUp> to RELEASES
	<PgDn> to SITE PARAMETERS

Figure 4.4-1. Default Report Screen.

#### 4.4.2 Report Descriptions

Meteorological and Plume Parameter Data: Contains information on temperature, wind direction, and atmospheric stability classes. This report also generates a table of plume depletion and deposition parameters. It is four pages.

Dose Table By Max Distance / Organ: Dose Equivalent Rate to each organ for the maximally exposed individual. It is one page.

Dose Table By Max Distance / Pathways: Effective Dose Equivalent and Dose Equivalent Rate to the organ with the highest dose for the maximally exposed individual by pathway for all radionuclides. It is one page.

Dose Table By Max Distance / Nuclide: Effective Dose Equivalent and Dose Equivalent Rate to the organ with the highest dose to the maximally exposed individual by radionuclide for all pathways. It is one page.

Dose Table By Max Distance / Location: Effective Dose Equivalent as a function of Distance in the directions of the maximally exposed individual for all radionuclides and all pathways. It is one page.

Dose Table for All Distances and All Directions: Effective Dose Equivalent as a function of all distances and all directions for all radionuclides and all pathways. It is one page.

Compliance Page: A brief synopsis of the site parameters and maximum dose equivalent (mrem/year) to the whole body and critical organ for nearby individuals. This report includes a cover page and one summary page. It is meant to be sent to the EPA.

## SECTION 5 - UTILITIES

### 5.1 SUMMARY OF THE UTILITY PROGRAMS

There are two utility programs that allow the user to customize AIRDOS-PC.

1. COLORS allows the user to customize the colors of the screens (located on the distribution diskette 2 of 2).
2. GETWIND allows the user to supply their own meteorological data when running AIRDOS-PC (wind data that was not provided on the AIRDOS-PC distribution diskettes). This program is located on distribution diskette 2 of 2 with the city wind files (GETWIND.EXE).

## 5.2 COLORS

### 5.2.1 What the Program Does

COLORS is a utility program that allows the user to customize AIRDOS-PC by specifying their own screen colors. You can change the color of each of the following parts of the screens:

Toggle fields : fields which contain a list of two or more preset choices. The default is yellow on black. In this document the toggle fields are shown in darker letters.

Labels : describe the input fields. The default is light cyan on black.

Input fields : fields where data can be entered. The default is white on blue.

Error messages: informative messages displayed when an error has occurred. The default is flashing yellow.

Wind files : the file names displayed in the wind file window when selecting a wind file. The default is white on cyan.

Highlight bar : initially the highlight bar is over the wind file name that is displayed in the wind field. As you scroll through the files listed using the arrow keys, the highlight bar will always identify the current wind data file in the wind file window. The default is cyan on blue.

#### EXAMPLES:

Label	Input field	
Annual Average Temperature:	<div style="border: 1px solid black; padding: 2px; display: inline-block;">0</div>	C <==== toggle field
Wind Data to Use <INS> for selection:	ABQ0282.WND	<=== toggle field
highlight bar ==>	ABQ0282.WND DEN0618.WND PIT1440.WND	<=== wind file
	AGS1018.WND ERI0610.WND SAF1184.WND	
	ALB0523.WND HTS0019.WND .....etc	

### 5.2.2 Defined Keys

<F1> thru <F6>: These function keys allow you to select which part of the screen you want to change. The part currently selected for change is highlighted. To change a different part of the screen, press the desired function key.

<F7>: This function key is used to set the part of the screen currently selected for change to either normal (nonblinking) or blinking. The current setting is highlighted. To toggle between the settings press the <F7> key.

<F9>: This function key can be used to reset the colors of the screens back to the default settings. The default colors are the following:

Toggle fields	yellow on black
Labels	light cyan on black
Input fields	white on blue
Error messages	yellow
Wind files	white on cyan
Highlight bar	cyan on blue

The <F9> key will not cause you to exit the program.

<F10>: This function key will save the selected colors and EXIT the COLORS program. You are returned to DOS. The AIRDOS-PC screens will now display the newly selected colors.

<esc>: This key allows you to EXIT the COLORS program. You are returned to DOS. Changes made during the session will not be saved. The old color settings for the screens will still be in effect.

### 5.2.3 Using the COLORS Program

If you are using a two 360k diskette system, insert diskette 2 of 2 and run the program as described below. After running COLORS copy the DEFAULTS file (no extension) from diskette 2 to the startup diskette (diskette 1).

To run the program type:

**COLORS <enter>**

A display of all the possible color choices will appear. The foreground color is shown (in writing) on the background color. Initially, the cursor is located on the color choice white on black. The cursor can be located by finding the flashing white first letter of a foreground colors name. It is the flashing white 'W' of the foreground color White. Use the arrow keys to move the cursor to other color combinations. The bottom half of the screen looks like the following:

<F1> = <b>Toggle fields</b>	Yellow	<F5> = Wind files	White
<F2> = Labels	Lt. Cyan	<F6> = Highlight bar	Cyan
<F3> = Input fields	White	<F7> = <b>Normal</b> / Blinking	
<F4> = Error messages	Yellow		

<enter> to accept color for chosen field

<F9> = Reset to default settings    <F10> = Save Values and End    <ESC> = Abort

The color setting for each part of the screen is displayed next to it. The part of the screen that has been selected for change is highlighted in cyan. To change the color of any parts of the screen described, press the desired function key (<F1>..<>F6>). Make sure your selection is highlighted. Use the arrow keys to move to the desired color combination. Press <enter>. The color combination selected will be displayed next to the highlighted selection.

When you have finished making changes press either <F9>, <F10>, or <esc>, depending on the desired action you want. See Subsection 5.2.2 for a more complete description of each.

## 5.3 GETWIND

### 5.3.1 What the Program Does

GETWIND is a utility program that allows the user to customize AIRDOS-PC by supplying their own meteorological data to the selection of wind data files provided with AIRDOS-PC. The distribution diskettes come with a total of 62 wind data files. If none of these files meet the needs of the user, GETWIND can be used to convert STAR formatted meteorological data into a valid AIRDOS-PC wind file. See Appendix C for an example of the STAR format. On distribution diskette 2 of 2 the file SAMPLE.STR contains a copy of this STAR format file. This file can be used as a guide for creating a meteorological file in star format.

### 5.3.2 Program Input

The user must supply the program with the name of the file that contains the STAR formatted meteorological data and the name of the file that will contain the converted STAR data (the AIRDOS-PC wind data file).

It is assumed that all the data files used by this program reside in the same directory as GETWIND. For this reason space is provided for only 12 characters when a file name is entered. This leaves enough room for the 8 character file name with a

three character extension. If you are running on a two 360k floppy system, GETWIND will be on diskette 2 of 2 with the city wind files. Create or copy your file containing the STAR formatted meteorological data to your backup diskette 2 and run GETWIND. Then copy the file created by GETWIND to diskette 1.

\* All valid DOS file names are accepted by the program, subject to the length restriction, and to the following restriction when naming the AIRDOS-PC wind data file that is being created: it must end with the three character file extension of '.wnd' (demowind.wnd). For more information on valid DOS file names refer to the DOS user's manual.

### 5.3.3 Program Output

Converted STAR wind data is written to the file specified. It is a valid AIRDOS-PC wind file and can be chosen as the wind data file for AIRDOS-PC. Make sure the file you have created is located in the same directory or on the same floppy as AIRDOSSC.EXE. If it's not you must copy it into the same directory in order to use it.

### 5.3.4 Using the GETWIND Program

To run the program type:

GETWIND <enter>

The following screen appears:

```
THIS PROGRAM CONVERTS STAR FORMAT WIND DATA
      TO AIRDOS-EPA FORMAT

FILE WHICH CONTAINS THE WIND DATA TO BE CONVERTED

      <CNTRL> BREAK    TO ABORT
```

enter the name of the file and press <enter>. If you have entered a valid DOS file name and the file can be found in the current directory the following message is then displayed:

FILE TO CONTAIN THE AIRDOS FORMATTED WIND DATA  
MUST HAVE THE EXTENSION .WND

Enter the name of the file that will contain the converted meteorological data. This is the file that you will be able to select in the wind file window located in the site parameter screen. If the file name already exists the following message is displayed on the screen:

**WARNING OUTPUT FILE ALREADY EXISTS**  
DO YOU WANT TO OVERWRITE IT ? (Y/N):

Enter <Y> or <y> to overwrite the file, any other key to enter another file name.

While the data is being read and converted, informative messages are displayed on the screen. When the program is finished you will be returned to DOS.

\* Pressing <cntrl> <break> at any time will cause the program to abort, and you'll be returned to DOS.

#### 5.3.5 Error Messages

**FILE NAME CANNOT BE GREATER THAN 12 CHARACTERS**  
PRESS ANY KEY TO CONTINUE

If you type in a file name that has more than 12 characters in it, the above message is displayed. A DOS file name can only have eight characters followed by a '.' and a three character extension. Think of a shorter file name and enter it again.

**ERROR INPUT FILE DOES NOT EXIST...**  
PRESS ANY KEY TO CONTINUE

If the name of the input file which contains the meteorological data cannot be found in the current directory, the above message is displayed. Make sure you have spelled the name of the file correctly and that it is located in the current directory.

**FILE EXTENSION MUST BE .WND**  
**PRESS ANY KEY TO CONTINUE**

If the name of the file entered that is to contain the converted meteorological data does not end in .wnd the above message is displayed. All AIRDOS-PC wind data files must have the file extension .wnd. These are the only files that will be displayed for selection in the wind files window located in the site parameter screen. Retype the file name and make sure the file extension is '.wnd' .

## SECTION 6 - TEST CASE

### 6.1 INPUT SCREENS

Figure 6.1-1 is the Site Parameter Screen, Figure 6.1-2 is the Release Rate Screen, and Figure 6.1-3 is the Report Screen. These figures show the input used for the test case (test case filename is SCREEN.INP).

SITE PARAMETERS			
Facility:	[REDACTED]		
Address:	[REDACTED]	Prepared By:	[REDACTED]
City:	[REDACTED]	State:	Name: [REDACTED]
Zip Code:	[REDACTED]	Title:	[REDACTED]
For Year:	[REDACTED]	Phone #:	[REDACTED]
Comment:	[REDACTED]		
Distance to Nearby Individuals:	Annual Average Temperature:	[REDACTED]	°C
(between 300 and 80,000 meters)	[REDACTED] meters	Rainfall Rate:	[REDACTED] cm/y
Wind Data to Use <INS> for selection:	BTM0357.WND	Lid Height:	[REDACTED] meters
Stack Identifier:	[REDACTED]	Source:	Stack Count: 2
Height (meters):	[REDACTED]	[REDACTED]	
Diameter (meters):	[REDACTED]	[REDACTED]	
<PLUME RISE>	[REDACTED]		
MOMENTUM (N/s ):	[REDACTED]	[REDACTED]	
 <Ins> to toggle HIGHLIGHTED fields <Esc> to MAIN MENU      <PgUp> to REPORTS      <PgDn> to RELEASES			

Figure 6.1-1. Testcase Site Parameter Screen.

RELEASE RATES (Ci/y):				
RADIO NUCLIDE	CLASS	AMAD	#1	#2
U-235	Y	1.		
U-238	Y	1.		
Th-232	Y	1.		
Pa-231	W	1.		
U-234	Y	.3		
Th-230	Y	.3		

<Esc> to MAIN MENU      <Ins> to toggle HIGHLIGHTED fields  
 <PgUp> to SITE PARAMETERS      <PgDn> to REPORTS

Figure 6.1-2. Testcase Release Rate Screen.

## REPORTS

PRINT (Y/N) ?

Meteorological and Plume Parameter Data	Y
Dose Table by Max Distance / Organ	Y
Dose Table by Max Distance / Pathways	Y
Dose Table by Max Distance / Nuclide	Y
Dose Table by Max Distance / Location	Y
Dose Table for All Distances and All Directions	Y

Compliance Page will be printed

<Ins> to toggle HIGHLIGHTED fields

<Esc> to MAIN MENU

<PgUp> to RELEASES

<PgDn> to SITE PARAMETERS

Figure 6.1-3. Testcase Report Screen.

## 6.2            **SAMPLE REPORTS**

The following are the reports output from the test case:

Figure 6.2-1 is the Meteorological and Plume Parameter Data

Figure 6.2-2 is the Compliance Report

Figure 6.2-3 is the Dose Table by Max Distance / Organ

Figure 6.2-4 is the Dose Table by Max Distance / Pathways

Figure 6.2-5 is the Dose Table by Max Distance / Nuclide

Figure 6.2-6 is the Dose Table by Max Distance / Location

Figure 6.2-7 is the Dose Table for All Distances and All  
Directions

METEOROLOGICAL AND PLANT INFORMATION SUPPLIED TO PROGRAM----

AVERAGE VERTICAL TEMPERATURE GRADIENT OF THE AIR (DEG K/METER)

IN STABILITY CLASS E	0.0728
IN STABILITY CLASS F	0.1090
IN STABILITY CLASS G	0.1455

PLUME DEPLETION AND DEPOSITION PARAMETERS

NUCLIDE	GRAVITATIONAL FALL VELOCITY (METERS/SEC)	DEPOSITION VELOCITY (METERS/SEC)	SCAVENGING COEFFICIENT (1/SEC)	EFFECTIVE DECAY CONSTANT IN PLUME (PER DAY)
U-238	0.000	0.00180	0.380E-05	0.000E+00
U-234	0.000	0.00180	0.380E-05	0.000E+00
TH-230	0.000	0.00180	0.380E-05	0.000E+00
RA-226	0.000	0.00180	0.380E-05	0.000E+00
PB-210	0.000	0.00180	0.380E-05	0.000E+00
PO-210	0.000	0.00180	0.380E-05	0.000E+00

Figure 6.2-1. Meteorological and Plume Parameter Data (1 of 4).

# FREQUENCY OF ATMOSPHERIC STABILITY CLASSES FOR EACH DIRECTION

SECTOR	FRACTION OF TIME IN EACH STABILITY CLASS						
	A	B	C	D	E	F	G
N	0.0030	0.0285	0.0440	0.2285	0.1527	0.5433	0.0000
NNW	0.0028	0.0463	0.0548	0.3032	0.1202	0.4727	0.0000
NW	0.0049	0.1031	0.1179	0.3428	0.1072	0.3241	0.0000
WNW	0.0231	0.1366	0.1262	0.4590	0.0497	0.2055	0.0000
W	0.0226	0.2512	0.0945	0.3662	0.0616	0.2040	0.0000
WSW	0.0241	0.3131	0.1657	0.2869	0.0350	0.1752	0.0000
SW	0.0410	0.3242	0.1436	0.2372	0.0427	0.2113	0.0000
SSW	0.0081	0.1874	0.1525	0.4319	0.0554	0.1647	0.0000
S	0.0210	0.1835	0.1366	0.4390	0.0711	0.1488	0.0000
SSE	0.0076	0.0930	0.1182	0.5609	0.0847	0.1356	0.0000
SE	0.0067	0.0769	0.0904	0.6141	0.0870	0.1250	0.0000
ESE	0.0073	0.0501	0.0841	0.6618	0.0838	0.1128	0.0000
E	0.0083	0.0768	0.0788	0.6130	0.0913	0.1318	0.0000
ENE	0.0110	0.0400	0.0752	0.7052	0.0654	0.1031	0.0000
NE	0.0174	0.0348	0.0816	0.5126	0.0947	0.2589	0.0000
NNE	0.0123	0.0395	0.0542	0.3380	0.1372	0.4189	0.0000

Figure 6.2-1. Meteorological and Plume Parameter Data (2 of 4).

# FREQUENCIES OF WIND DIRECTIONS AND RECIPROCAL-AVERAGED WIND SPEEDS

WIND TOWARD	FREQUENCY	WIND SPEEDS FOR EACH STABILITY CLASS (METERS/SEC)						
		A	B	C	D	E	F	G
N	0.108	0.77	0.89	1.15	2.29	3.37	1.06	0.00
NNW	0.118	0.77	0.90	1.43	2.93	3.31	0.96	0.00
NW	0.067	0.91	0.94	1.52	2.49	3.08	0.96	0.00
WNW	0.029	0.83	0.94	1.86	2.84	2.85	0.95	0.00
W	0.015	0.91	0.96	1.52	1.96	2.95	0.96	0.00
WSW	0.014	0.91	1.01	1.45	1.84	2.92	0.86	0.00
SW	0.024	0.77	0.97	1.43	1.42	2.72	0.91	0.00
SSW	0.041	0.91	0.94	1.38	1.78	3.16	0.88	0.00
S	0.064	0.87	0.96	1.55	2.11	3.03	0.94	0.00
SSE	0.089	0.90	1.00	1.79	2.38	3.23	0.91	0.00
SE	0.100	0.90	0.96	1.93	3.08	3.38	0.98	0.00
ESE	0.091	0.83	1.02	1.92	3.50	3.49	0.94	0.00
E	0.040	0.91	1.08	2.14	2.94	3.26	0.88	0.00
ENE	0.061	0.90	1.00	2.16	3.99	3.36	0.90	0.00
NE	0.058	0.86	1.04	1.78	2.80	3.11	0.94	0.00
NNE	0.081	0.81	0.99	1.55	2.52	3.38	1.00	0.00

Figure 6.2-1. Meteorological and Plume Parameter Data (3 of 4).

# FREQUENCIES OF WIND DIRECTIONS AND TRUE-AVERAGE WIND SPEEDS

WIND TOWARD	FREQUENCY	WIND SPEEDS FOR EACH STABILITY CLASS (METERS/SEC)						
		A	B	C	D	E	F	G
N	0.108	0.77	1.22	2.07	4.71	3.61	1.46	0.00
NNW	0.118	0.77	1.21	2.70	5.16	3.55	1.28	0.00
NW	0.067	1.15	1.36	2.95	5.14	3.29	1.28	0.00
WNW	0.029	0.96	1.31	3.24	5.60	3.00	1.25	0.00
W	0.015	1.15	1.31	2.60	3.89	3.13	1.27	0.00
WSW	0.014	1.15	1.52	2.47	3.76	3.10	1.03	0.00
SW	0.024	0.77	1.38	2.39	2.51	2.82	1.16	0.00
SSW	0.041	1.15	1.34	2.34	3.29	3.39	1.08	0.00
S	0.064	1.05	1.35	2.51	4.05	3.23	1.24	0.00
SSE	0.089	1.15	1.49	3.05	4.39	3.46	1.15	0.00
SE	0.100	1.15	1.45	3.31	5.35	3.62	1.31	0.00
ESE	0.091	0.96	1.67	3.56	5.83	3.72	1.24	0.00
E	0.040	1.15	1.74	3.66	5.06	3.49	1.08	0.00
ENE	0.061	1.15	1.44	4.02	6.12	3.60	1.15	0.00
NE	0.058	1.02	1.64	3.35	5.29	3.32	1.24	0.00
NNE	0.081	0.90	1.50	3.02	4.90	3.62	1.35	0.00

Figure 6.2-1. Meteorological and Plume Parameter Data (4 of 4).

40 CFR Part 61  
National Emission Standards  
for Hazardous Air Pollutants

CLEAN AIR ACT COMPLIANCE REPORT  
(Version 3.0 November 1989)

Facility: Facility Name  
Address: Your Address  
          Your City/Location , ST. 12345-0001  
Annual Assessment for Year: 1989  
Date Submitted: 11/30/89  
  
Comments: Test Case

Prepared By:

Name: Your Name  
Title: Your Title  
Phone #: (123) 456-7890

Prepared for:  
U.S. Environmental Protection Agency  
Office of Radiation Programs  
Washington, D.C. 20460

Figure 6.2-2. Compliance Report (1 of 2).

# CLEAN AIR ACT COMPLIANCE REPORT

11/30/89 8:14 AM

Facility: Facility Name  
Address: Your Address  
Comments: Test Case  
Year: 1989

City: Your City/Location State: ST

Effective Dose Equivalent  Highest Organ Dose is to LUNGS	Dose Equivalent Rates to Nearby Individuals (mrem/year)	
	1.5	
	8.9	

## -----EMISSION INFORMATION-----

Radio-nuclide	Class	Amad	Stack #1 (Ci/y)	Stack #2 (Ci/y)
U-238	Y	1.0	0.0E-01	1.6E-03
U-234	Y	1.0	0.0E-01	1.6E-03
TH-230	Y	1.0	0.0E-01	1.6E-03
RA-226	W	1.0	0.0E-01	1.6E-03
PB-210	Y	0.3	1.1E-02	1.4E-03
PO-210	Y	0.3	1.1E-02	2.1E-03
Stack Height (m)			27.00	29.00
Stack Diameter (m)			1.20	5.00
Momentum (m/s)			15.0	10.0

## -----SITE INFORMATION-----

Wind Data	BTM0357.WND	Temperature (C)	5
Food Source	LOCAL	Rainfall (cm/y)	38
Distance to Individuals (m)	750	Lid Height (m)	1700

\*NOTE: The results of this computer model are dose estimates.  
They are only to be used for the purpose of determining  
compliance and reporting per 40 CFR 61.93 and 40 CFR 61.94.

Figure 6.2-2. Compliance Report (2 of 2).

## ORGAN DOSE TO THE MAXIMALLY EXPOSED INDIVIDUAL

ORGAN	DOSE EQUIVALENT RATE TO THE ORGAN (mrem/y)
-----	-----
GONADS	4.0E-02
BREAST	4.0E-02
RED MARROW	4.1E-01
LUNGS	8.9E+00
THYROID	4.0E-02
ENDOSTEUM	5.5E+00
REMAINDER	6.0E-01
EFFECTIVE	1.5E+00

Facility Name

Figure 6.2-3. Dose Table by Max Distance / Organ.

DOSE TO THE MAXIMALLY EXPOSED INDIVIDUAL  
BY PATHWAY FOR ALL RADIONUCLIDES

	EFFECTIVE DOSE EQUIVALENT (mrem/y)	DOSE EQUIVALENT TO THE ORGAN WITH THE HIGHEST DOSE LUNGS (mrem/y)
	-----	-----
INGESTION	3.4E-01	3.7E-02
INHALATION	1.1E+00	8.8E+00
AIR IMMERSION	5.3E-09	3.7E-09
GROUND SURFACE	1.9E-04	1.1E-04
	-----	-----
TOTAL:	1.5E+00	8.9E+00

Facility Name

Figure 6.2-4. Dose Table by Max Distance / Pathway

DOSE TO THE MAXIMALLY EXPOSED INDIVIDUAL  
BY RADIONUCLIDE FOR ALL PATHWAYS

RADIONUCLIDE	EFFECTIVE DOSE EQUIVALENT (mrem/y)	DOSE EQUIVALENT TO THE ORGAN WITH THE HIGHEST DOSE LUNGS (mrem/y)
U-238	4.6E-02	3.5E-01
U-234	5.1E-02	3.9E-01
TH-230	9.1E-02	3.8E-01
RA-226	8.6E-03	2.3E-02
PB-210	1.1E+00	6.6E+00
PO-210	2.1E-01	1.1E+00
<hr/>		
TOTAL :	1.5E+00	8.9E+00

Facility Name

Figure 6.2-5. Dose Table by Max Distance / Nuclide.

EFFECTIVE DOSE EQUIVALENT AS A FUNCTION  
OF DISTANCE IN THE DIRECTIONS OF THE  
MAXIMALLY EXPOSED INDIVIDUAL FOR  
ALL RADIONUCLIDES AND ALL PATHWAYS

DIRECTION : SOUTH-SOUTHEAST

DISTANCE (meters)	EFFECTIVE DOSE EQUIVALENT (mrem/y)
-----	-----
750	1.5E+00
1000	1.1E+00
3000	2.9E-01
10000	6.4E-02
80000	2.8E-03

Facility Name

Figure 6.2-6. Dose Table by Max Distance / Location.

EFFECTIVE DOSE EQUIVALENT AS A FUNCTION  
OF ALL DISTANCES AND ALL DIRECTIONS FOR ALL  
RADIONUCLIDES AND ALL PATHWAYS

DIRECTIONS:	N	NNE	NE	ENE	E	ESE	SE	SSE
DISTANCE (METERS):								
750	9.4E-01	8.6E-01	7.4E-01	7.4E-01	5.7E-01	1.2E+00	1.5E+00	1.5E+00
1000	7.6E-01	6.7E-01	5.7E-01	5.6E-01	4.4E-01	9.3E-01	1.1E+00	1.1E+00
3000	4.2E-01	2.9E-01	1.8E-01	1.5E-01	1.2E-01	2.4E-01	2.9E-01	2.9E-01
10000	1.4E-01	9.1E-02	5.0E-02	3.3E-02	2.6E-02	5.4E-02	6.5E-02	6.4E-02
80000	6.3E-03	4.0E-03	2.2E-03	1.5E-03	1.2E-03	2.5E-03	2.9E-03	2.8E-03
	S	SSW	SW	WSW	W	WNW	NW	NNW
DISTANCE (METERS):								
750	1.2E+00	8.1E-01	4.8E-01	2.8E-01	2.7E-01	4.5E-01	9.3E-01	1.1E+00
1000	8.8E-01	6.1E-01	3.5E-01	2.0E-01	2.0E-01	3.3E-01	6.9E-01	8.6E-01
3000	2.2E-01	1.5E-01	8.5E-02	4.4E-02	5.1E-02	8.8E-02	2.3E-01	4.0E-01
10000	4.7E-02	3.3E-02	2.0E-02	9.7E-03	1.2E-02	2.2E-02	6.5E-02	1.4E-01
80000	2.1E-03	1.4E-03	8.8E-04	4.5E-04	5.3E-04	9.6E-04	2.9E-03	5.9E-03

Facility Name

Figure 6.2-7. Dose Table for All Distances and All Directions.

## APPENDIX A

### VALID RADIONUCLIDES

The following is the list of radionuclides that can be entered in the Release Rates Screen for modeling.

AM-241	P-32
AR-41	PA-234
BA-137M	PB-210
BA-140	PB-214
BI-214	PO-210
C-11	PU-239
C-14	PU-240
CO-60	PU-241
CS-137	RA-226
CS-138	SR-90
H-3	TC-99M
I-125	TH-230
I-129	TH-232
I-131	TH-234
KR-85	U-234
KR-85M	U-235
KR-88	U-238
LA-140	XE-127
MO-99	XE-133
N-33	Y-90
O-15	

## APPENDIX B

The following is a list of the meteorological (wind) data files included with this version of AIRDOS-PC, and the name of the city/site each file represents. The meteorological data file names are listed alphabetically and are separated into Department of Energy (DOE) sites followed by major cities.

### DOE SITES

<u>FILE NAME</u>	<u>CITY</u>	<u>FACILITY NAME</u>
ABQ0282.WND	Albuquerque, NM	Lovelace Research Institute
AGS1018.WND	Augusta/Bush, GA	Savannah River Plant
ALB0523.WND	Albany, NY	Knolls Atomic Power Lab
ALO0729.WND	Waterloo, IA	Kesselring/Knolls
AMA0621.WND	Amarillo, TX	Ames Lab
BDL1262.WND	Hartford/Bradley, CT	Pantex Plant
BUR1051.WND	Burbank, CA	Knolls Atomic Power Lab-Windsor
CMH0243.WND	Columbus, OH	Rockwell International
CVE0403.WND	Cleveland, OH	Battelle Memorial Institute
DAY1502.WND	Dayton, OH	National Lead Company of Ohio
DEN0618.WND	Denver, CO	Mound Facility
ERI0610.WND	Erie, PA	Rocky Flats Plant
HTS0019.WND	Huntington, WV	Reactive Metals, Inc (Ohio)
LEA0435.WND	New York/La Guardia, NY	Portsmouth Gaseous Diffusion Plant (Ohio)
MDW0675.WND	Chicago/Midway, IL	Brookhaven National Lab
MWH0486.WND	Moses Lake/Grant, WA	Argonne National Lab
OAK0319.WND	Oakland, CA	Hanford Reservation
ORD0452.WND	Chicago/O'Hare, IL	Lawrence Berkeley Lab
PAH0479.WND	Paducah, KY	Fermi National Accelerator Lab
PIH0359.WND	Pocatello, ID	Paducah Gaseous Diffusion Plant
PIT1440.WND	Pittsburgh, PA	Idaho National Engineering Lab
SAF1184.WND	San Francisco, CA	Bettis Atomic Power Lab
SUU0316.WND	Fairfield/Travis, CA	Los Alamos National Lab
TPA0662.WND	Tampa, FL	University of CA, Berkeley
TYS1328.WND	Knoxville, TN	Lawrence Livermore Lab
UCC1026.WND	Yucca Flats, NV	Pinellas Plant
		Oak Ridge
		Nevada Test Site

## CITIES

<u>FILE NAME</u>	<u>CITY</u>
ABQ0282.WND	Albuquerque, NM.
AGS1018.WND	Augusta, GA.
ALB0523.WND	Albany, NY.
BATONROU.WND	Baton Rouge, LA.
BI_MT.WND	Billings, MO.
BOS0211.WND	Boston, MA.
BR_FL.WND	Bartow, FL.
BTM0357.WND	Butte, MO.
CLE1140.WND	Cleveland, OH.
CLT0682.WND	Charlotte, NC.
CMH0243.WND	Columbus, OH.
CNM1741.WND	Carlsbad, NM.
CPR0335.WND	Casper, WY.
DAY0404.WND	Dayton, OH.
DCA1047.WND	Washington, DC.
DEN0952.WND	Denver, CO.
FMN0285.WND	Farmington, NM.
FWA1156.WND	Ft. Wayne, IN.
GEG0360.WND	Spokane, WA.
GJT0476.WND	Grand Junction, CO.
GR_NM.WND	Grants, NM.
HAR0631.WND	Harrisburg, PA.
HV40302.WND	Hanksville, UT.
IAG0905.WND	Niagra Falls, NY.
INW0314.WND	Winslow, AZ.
LAX0304.WND	Los Angeles, CA.
LR_AR.WND	Little Rock, AK.
LSV0658.WND	Las Vegas, NV.
MDW0675.WND	Chicago, IL.
MYR1027.WND	Myrtle Beach, SC.
NY_NY.WND	New York City, NY
NZY0380.WND	San Diego, CA.
PIT1427.WND	Pittsburg, PA.
PO_ID.WND	Pocatello, ID.
PVD0560.WND	Providence, RI.
SAT0064.WND	San Antonio, TX.
SFO1122.WND	San Francisco, CA.
SLC1411.WND	Salt Lake City, UT.
SL_MO.WND	St. Louis, MO.
TPA0915.WND	Tampa, FL.
YIP1061.WND	Detroit, MI.

## APPENDIX C

This is a STability ARay (STAR) file. It shows the frequencies of occurrence that the wind is blowing FROM a particular direction, at a particular stability, at a particular speed. GETWIND converts the star array to a WIND file which shows wind blowing TOWARD (not FROM) particular directions. The frequencies are in x.xxxxx format, unspaced. The format is:

column        1: Blank  
              2-4: Wind Direction  
              6: Stability Category  
              8: Start of the Wind Speed Categories (knots)  
              8-14: Wind Speeds 1-3 (knots)  
              15-21: Wind Speeds 4-6 (knots)  
              22-28: Wind Speeds 7-10 (knots)  
              29-35: Wind Speeds 11-16 (knots)  
              36-42: Wind Speeds 17-21 (knots)  
              43-49: Wind Speeds > 21 (knots)

```
N A 0.000080.000660.000000.000000.000000.000000
NNE A 0.000160.000330.000000.000000.000000.000000
NE A 0.000160.000160.000000.000000.000000.000000
ENE A 0.000080.000000.000000.000000.000000.000000
E A 0.000000.000000.000000.000000.000000.000000
ESE A 0.000000.000000.000000.000000.000000.000000
SE A 0.000160.000160.000000.000000.000000.000000
SSE A 0.000410.000490.000000.000000.000000.000000
S A 0.000160.000330.000000.000000.000000.000000
SSW A 0.000330.000410.000000.000000.000000.000000
SW A 0.000740.000410.000000.000000.000000.000000
WSW A 0.000570.000410.000000.000000.000000.000000
W A 0.000570.001070.000000.000000.000000.000000
WNW A 0.000330.000330.000000.000000.000000.000000
NW A 0.000330.000570.000000.000000.000000.000000
NNW A 0.000160.000490.000000.000000.000000.000000
N B 0.001860.001390.000250.000000.000000.000000
NNE B 0.001800.000820.000000.000000.000000.000000
NE B 0.002130.000660.000000.000000.000000.000000
ENE B 0.000410.000160.000000.000000.000000.000000
E B 0.000410.000160.000000.000000.000000.000000
ESE B 0.000330.000820.000080.000000.000000.000000
SE B 0.000740.001880.000000.000000.000000.000000
SSE B 0.001480.002620.000250.000000.000000.000000
S B 0.001560.002460.000080.000000.000000.000000
SSW B 0.001230.001720.000160.000000.000000.000000
SW B 0.001390.001800.000330.000000.000000.000000
WSW B 0.002130.002130.000740.000000.000000.000000
W B 0.003120.002300.000160.000000.000000.000000
WNW B 0.001880.002460.000330.000000.000000.000000
NW B 0.001310.001610.000250.000000.000000.000000
```

NNW B 0.002050.003440.000080.000000.000000.000000  
 N C 0.003440.003280.000900.000080.000000.000000  
 NNE C 0.002620.001480.000080.000000.000000.000000  
 NE C 0.003120.000820.000080.000000.000000.000000  
 ENE C 0.001390.001070.000160.000000.000000.000000  
 E C 0.001070.001310.000250.000000.000000.000000  
 ESE C 0.000570.000820.000900.000000.000000.000000  
 SE C 0.001390.002460.002790.000410.000000.000000  
 SSE C 0.001970.005900.004260.000330.000000.000000  
 S C 0.001390.005740.001880.000330.000000.000000  
 SSW C 0.001390.002790.001310.000080.000000.000000  
 SW C 0.001800.004430.003770.000490.000000.000000  
 WSW C 0.002210.004020.004260.000820.000000.000000  
 W C 0.003940.006310.003360.000330.000000.000000  
 WNW C 0.002700.004840.002380.000080.000000.000000  
 NW C 0.003030.005900.003120.000080.000000.000000  
 NNW C 0.003610.006890.001720.000080.000000.000000  
 N D 0.010000.013360.007300.001070.000000.000000  
 NNE D 0.005570.007300.002870.000250.000080.000000  
 NE D 0.004590.003200.000570.000160.000000.000000  
 ENE D 0.002870.003770.001070.000160.000000.000000  
 E D 0.002210.004430.002460.000660.000000.000000  
 ESE D 0.002790.003280.006560.002950.000570.00008  
 SE D 0.002620.007460.025170.015490.001230.00000  
 SSE D 0.002300.013030.026310.010660.000490.00008  
 S D 0.002300.010580.011310.005490.000490.00016  
 SSW D 0.004100.007130.005820.005250.001070.00016  
 SW D 0.005410.016070.016560.009840.000980.00016  
 WSW D 0.003030.010250.018850.011390.000660.00000  
 W D 0.003850.011230.021310.014020.002210.00016  
 WNW D 0.004100.008940.015830.011230.000740.00016  
 NW D 0.007460.013200.019590.011480.000330.00000  
 NNW D 0.011070.013200.014510.003610.000080.00008  
 N E 0.007460.014180.001150.000000.000000.00000  
 NNE E 0.006070.011480.000330.000000.000000.00000  
 NE E 0.003770.008120.000250.000000.000000.00000  
 ENE E 0.003940.007210.000250.000000.000000.00000  
 E E 0.004670.012460.000330.000000.000000.00000  
 ESE E 0.003770.007050.001880.000000.000000.00000  
 SE E 0.002380.011970.008120.000000.000000.00000  
 SSE E 0.002620.009590.004510.000000.000000.00000  
 S E 0.002380.007130.002460.000000.000000.00000  
 SSW E 0.002460.004260.000980.000000.000000.00000  
 SW E 0.002620.003940.002300.000000.000000.00000  
 WSW E 0.001390.002790.001800.000000.000000.00000  
 W E 0.002790.009020.003610.000000.000000.00000  
 WNW E 0.003770.010410.002130.000000.000000.00000  
 NW E 0.006480.012620.003440.000000.000000.00000  
 NNW E 0.010250.018120.003520.000000.000000.00000  
 N F 0.000410.001070.000000.000000.000000.00000  
 NNE F 0.000570.001970.000000.000000.000000.00000  
 NE F 0.000980.000900.000000.000000.000000.00000

```

ENE F 0.000330.002210.000000.000000.000000.000000
  E F 0.001230.001800.000000.000000.000000.000000
ESE F 0.000660.001480.000000.000000.000000.000000
  SE F 0.000330.000820.000000.000000.000000.000000
SSE F 0.000080.000490.000000.000000.000000.000000
  S F 0.000160.000250.000000.000000.000000.000000
SSW F 0.000160.000000.000000.000000.000000.000000
  SW F 0.000000.000080.000000.000000.000000.000000
WSW F 0.000160.000080.000000.000000.000000.000000
  W F 0.000080.000490.000000.000000.000000.000000
WNW F 0.000740.001230.000000.000000.000000.000000
  NW F 0.000410.001070.000000.000000.000000.000000
NNW F 0.000250.001720.000000.000000.000000.000000

```

SAMPLE.STR is a sample file containing this data which can be found on distribution diskette 2 of 2.