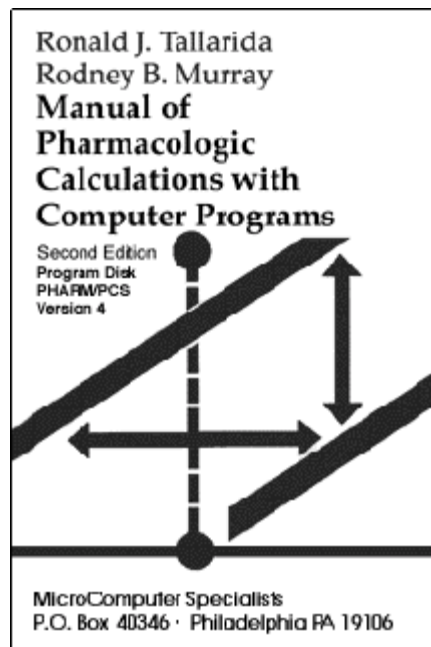


PHARM/PCS Version 4.2

User Guide Supplement

Pharmacologic Calculation System  
based on  
"Manual of Pharmacologic Calculations  
with Computer Programs"  
Second Edition



by R.J. Tallarida and R.B. Murray  
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PHARM/PCS User Guide Supplement  
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# PHARM/PCS Version 4.2 User Guide Supplement

## Contents

I.	Introduction.....	2
A.	System Requirements:.....	2
B.	Program Registration.....	2
II.	Installation.....	3
A.	Floppy Installation .....	3
B.	Hard Disk Installation .....	3
C.	Running PHARM/PCS .....	4
D.	Creating a Data Directory .....	4
III.	Version 4.1 Enhancements.....	5
A.	<V>ersion Maintenance Utility - Color Support.....	5
B.	<E>dit Menu: <T>ransform Data .....	6
IV.	Version 4.2 Enhancements.....	8
A.	Compiled versus Interpreted.....	8
1.	Speed.....	8
2.	Accuracy.....	8
3.	Ease of Use .....	9
B.	<S>ave Configuration Utility [no longer needed].....	9
C.	<S>hell to DOS prompt .....	10
D.	Data Import and Export.....	10
1.	Data File Format.....	11
2.	Using Microsoft Excel with PHARM/PCS.....	12
3.	Using Lotus 1-2-3 with PHARM/PCS .....	12
	Appendix - Error Codes.....	14
	Index .....	15

## **I. Introduction**

PHARM/PCS runs 47 procedures from the book *Manual of Pharmacologic Calculations with Computer Programs, 2nd Edition*. It is assumed that you are familiar with the *Manual*, which details the operations that are necessary to operate individual procedures in PHARM/PCS.

This *User Guide Supplement* covers differences and enhancements to PHARM/PCS that have been added since publication of the *Manual*. (PHARM/PCS Version 4.0).

### **A. System Requirements:**

IBM-PC or compatible computer (including Macintosh running SoftPC)

512K of RAM memory

PC-DOS or MS-DOS, Version 3.1 or later

2 Floppy disk drives (Hard Disk recommended)

Monochrome or Color Monitor

Printer (optional)

### **B. Program Registration**

Before you forget, please take a moment to fill out the enclosed registration card completely and mail it within 30 days to the address on the card. This establishes you as a customer of this product and entitles you to receive upgrade information.

Registered owners of PHARM/PCS will be placed in the MCS database and will be informed of major upgrades, enhancements, and new releases of this program. Owners who do not register their copy of PHARM/PCS will not be entitled to receive technical support.

## **II. Installation**

Please read the `README.PCS` file on your PHARM/PCS diskette. It is a plain text file that contains information that was not available at the time this User Guide was printed. At the DOS prompt type `PRINT README.PCS`.

For safety sake, please make a backup copy of the original PHARM/PCS diskette. Label the copy "PHARM/PCS Master Disk" and file the original diskette in a safe place.

### **A. Floppy Installation**

If you have 2 floppy drives (and no hard disk), first make a system disk. Place a new unformatted disk in Drive B. At the DOS prompt, type...

```
A> FORMAT B: /S
```

Label the new system disk "PHARM/PCS System Disk" and insert it in Drive A. Insert the PHARM/PCS Master Disk in Drive B, move to Drive B and install PHARM/PCS by typing ...

```
A> B:  
B> INSTALL
```

### **B. Hard Disk Installation**

If you have a hard disk, move to the drive where you placed the PHARM/PCS Master Disk and install by typing (assuming you are installing on Drive C) ...

```
C> A:  
A> INSTALL
```

Follow the instructions that appear on the screen. PHARM/PCS installs files on the disk and subdirectory of your choosing. The installation program will also modify your `AUTOEXEC.BAT` file or create one if needed.

### C. Running PHARM/PCS

The installation process also copies the PHARM/PCS loader program, `PCS.BAT`, onto your disk. Run PHARM/PCS by typing:

```
C> PCS
```

or

```
C> PCS 8
```

to run procedure 8 (or any of the other 47 procedures) immediately (New feature in Version 4.2).

PHARM/PCS knows where to look for its files - in the subdirectory you specify during the installation process (`C:\PCS` by default). You don't have to move into this directory to run PHARM/PCS, in fact, it's best to be in a directory where you would like to store your data and report files. See the next section to learn how to create your own *data* directory.

### D. Creating a Data Directory

PHARM/PCS saves data files, and `REPORT.TXT` (p. 214 in the *Manual*) in the *current* directory. You may want to create a special directory for PHARM/PCS *data* files. Move to that directory, then type "PCS".

```
C> MKDIR DATA (make new directory)
C> CHDIR DATA (move to data directory)
C> PCS (execute PHARM/PCS)
```

Note: The directory name, `DATA`, is for illustration purposes. You may select any valid directory name. In fact, you may want to create several different data directories for handling different kinds of data.

### **III. Version 4.1 Enhancements**

Version 4.0 is the version of PHARM/PCS illustrated in the *Manual*. Since its publication, several new enhancements have been added. The following were added with Version 4.1.

#### **A. <V>ersion Maintenance Utility - Color Support**

PHARM/PCS supports color monitors. You have the option to change the background screen color, the color of the text, the color of the prompts, and the prompt highlight color. The default colors are white (color #7) text on a black (color #0) background and black prompts highlighted with white. These defaults will normally be used by those with monochrome monitors.

Choose the <V>ersion Maintenance Utility at the main "Procedure:" menu to change the default colors. The following illustrates changing the background color to blue (# 1 ) and the prompt background color to yellow (#6).

```
Procedure: <##>, <E>xit, <?>, or <RETURN> for next screen ? Y
```

The Version Maintenance screen will appear ...

```

                                <V>ersion Maintenance Utility
          Pharmacologic Calculation System - Version 4.2    09/07/1990

Enter new variable or press <RETURN> to leave current value
unchanged. See 'Manual' for explanation of variables.

Description          (Min,Max) Current      New Value
Number of Files      (2,25)    10          .<RETURN> 10
Number of Items/File (5,1024)  20          .<RETURN> 20
Left Margin          (0,20)    0           .<RETURN> 0

Enter Monitor Type: Color or Monochrome (C/M) ? C
Do you want to change colors (Y/N) ? Y
```

A "color map" aids in selecting the desired colors. There are 8 background colors and 16 foreground colors for text. The map displays all possible combinations, showing asterisks in the 16 foreground colors against 8 different bands of background color. The screen will clear and the color map will appear (in color, of course) ...

```

Color Map:
                                T E X T
B                                1 1 1 1 1 1
A                                0 1 2 3 4 5
C 0 * * * * * * * * * * * * * *
K 1 * * * * * * * * * * * * * *
G 2 * * * * * * * * * * * * * *
R 3 * * * * * * * * * * * * * *
O 4 * * * * * * * * * * * * * *
U 5 * * * * * * * * * * * * * *
N 6 * * * * * * * * * * * * * *
D 7 * * * * * * * * * * * * * *

Background Color   (0,7)    0 [ Backgr ] ? 1
Text Color        (0,15)   15 [ Text   ] ? 15 [ Text   ]
Prompt Background (0,7)    7 [ Prompt ] ? 6
Prompt Color      (0,15)   0 [ Prompt ] ? 0 [ Prompt ]

Do you want to change any system variables (Y/N) ? N
    
```

If you answer "Y" to the "change system variables" prompt, you again have the opportunity to change the variables starting with the "Number of Files" prompt.

**B. <E>dit Menu: <T>ransform Data**

PHARM/PCS also allows you to transform your data using several common functions. Several procedures automatically convert dose to log(dose) data when required. This may be sufficient when you are dealing with dose-response curve analysis, but not in other circumstances. For example, you may want to run Procedure #5, "Analysis of the Regression Line," on log data without first having to use a calculator to convert from your raw data to logs.

At the "Edit:" menu, you may elect to <T>ransform your data before

further analysis. The following transforms are available:

<1> log(number) - returns common logarithm of number

<2> 10<sup>number</sup> - returns antilog

<3> ln(number) - returns natural logarithm of number

<4> exp(number) - returns natural exponent of number

<5> 1/number - returns reciprocal of number

Remember, if you elect to save the data file using the same name after transformation, your original file will be replaced with the transformed data.

The following illustrates converting the X values in a file with log(X) ...

```

Edit: <C>hange, <D>elete, <I>nsert, <L>ist, <R>ename, <T>ransform? L

File name: EXAMPLE.XY
Variable:      X          Y

# 1:          3          4
# 2:          5          6
# 3:          8          7
# 4:         10         10
# 5:         15         12

Edit: <C>hange, <D>elete, <I>nsert, <L>ist, <R>ename, <T>ransform? T

Transform <X>-X, <Y>-Y? X

Transform: <1> log(X), <2> 10^X, <3> ln(X), <4> exp(X), <5> 1/X ? 1

X ---> log(X)

Edit: <C>hange, <D>elete, <I>nsert, <L>ist, <R>ename, <T>ransform? L

File name: EXAMPLE.XY
Variable:      log(X)     Y

# 1:          .4771213   4
# 2:          .69897    6
# 3:          .90309    7
# 4:          1         10
# 5:          1.176091  12
    
```

## **IV. Version 4.2 Enhancements**

Version 4.2 is a major upgrade to PHARM/PCS. The following describes the enhancements over Version 4.1.

### **A. Compiled versus Interpreted**

PHARM/PCS Version 4.2 is a compiled program, i.e., an executable program (.EXE file). Previously, owners of PHARM/PCS were required to own a copy of a BASIC interpreter (BASIC, BASICA, or GWBASIC). The main advantages of this compiled version are speed, accuracy and ease of use.

#### **1. Speed**

A high level language such as BASIC must be converted to machine code for the program to operate. An interpreter (e.g., your copy of BASICA) takes this English-like code and "interprets" it into machine code each time the program is run. In fact, code within program loop (sections of code that are repeated over and over) must be re-interpreted each time instructions within the loop are encountered. This takes time! Compiled programs only interpret this code once - at compile time, before the disk is published. This results in speed increases of up to ten times or more.

#### **2. Accuracy**

Interpreted BASIC typically use the binary number system to represent numbers internally in the computer's memory. Binary numbers, however, cannot precisely represent decimal numbers in all cases. For example, entering "0.009" returns "8.999999E-03" in a system using binary math.

The compiled language used for PHARM/PCS Version 4.2 uses binary-coded decimal (BCD) to represent numbers. This system represents accurately (entering "0.009" returns "0.009") any decimal number to 7 places . Most programs used for financial calculations (e.g., Lotus 1-2-3) use BCD math.

NOTE: Results obtained from Version 4.2 may differ slightly and are more accurate than those of earlier versions (i.e., examples in the *Manual*), but these differences are in the fifth or higher decimal place and are most likely insignificant.

### **3. Ease of Use**

The major change with Version 4.2 that improves ease of use regards the <S>ave Configuration Utility - it is no longer needed (see below). Another improvement is the ability to immediately run a particular procedure without having to view the Main Menu screen - at the DOS prompt, just type 'PCS *nn*' where *nn* is the number of the procedure you want to use (see page 4). Version 4.2 is also more flexible regarding its placement on your hard disk. During the installation process you decide where the PHARM/PCS files go and what to call the subdirectory where they reside. Also, data may now be imported from and exported to other programs, e.g., Lotus 1-2-3 and Microsoft Excel.

#### **B. <S>ave Configuration Utility [no longer needed]**

The <S>ave Configuration Utility is no longer needed. Previous versions of PHARM/PCS were written in interpreted BASIC. Because of memory limitations, sections of program code were "merged" into the main program when procedures were run for the first time. You could then elect to save "configurations" of commonly used procedures so that the merging would be minimized in future PHARM/PCS sessions.

Now, selecting a procedure from the Main Menu or from the DOS prompt will load and run the proper PHARM/PCS module quickly, without merging.

### C. <S>hell to DOS prompt

In 4.2, you may now temporarily suspend PHARM/PCS and return to the DOS prompt by typing 'S' at the Main Menu ....

```
Procedure: <##>, <E>xit, <?>, or <RETURN> for next screen ? S
```

The screen will clear and you are reminded to type "EXIT" to return to PHARM/PCS.

```
<S>hell to DOS Prompt
Pharmacologic Calculation System - Version 4.2(A) - 10-05-1990

Type 'EXIT' to return to PHARM/PCS.

Microsoft(R) MS-DOS(R) Version 3.30
(C)Copyright Microsoft Corp 1981-1987

C:\
```

You may want to use this option to change directories or perform other DOS commands while keeping PHARM/PCS ready to resume.

### D. Data Import and Export

PHARM/PCS creates two kinds of files - report files and data files. Both types of files are plain text files (ASCII), and so may be used by other programs. As mentioned in the *Manual*, PHARM/PCS creates a text file each time you run a procedure. The name for this file is REPORT.TXT, and may be viewed, printed or renamed at the end of a procedure (to prevent it from being overwritten next time). Of course, you may *import* this text file into any word processor you desire for producing your final report.

## 1. Data File Format

Data files take any valid DOS filename (8 characters followed by a period and a 3 character extension). Most procedures use either a 1, 2 or 3 variable data file and the *Manual* recommends that you label data files using the extension: ".Y", ".XY" and ".XYZ."

Version 4.2 uses a new format for its data files - comma delimited ASCII. Of course, it still reads data files created by earlier versions of PHARM/PCS. Commas are used to separate variables for each data item (x,y pair or x,y,z triplet) and each data item is followed by a carriage return (ASCII 13). In addition, each file begins with a special identifier line:

Y data header: "Y,"

XY data header: "*x name*", "*y name*"

XYZ data header: "*x name*", "*y name*", "*z name*",

where, the *names* are assigned by the procedure and describe the variable.

The three types of data files are shown below. You can use the PHARM-/PCS <R>eport <V>iew command or the DOS TYPE command to view data files.

```
C:\>type file1.y
"Y,"
1
2
3
4
5
```

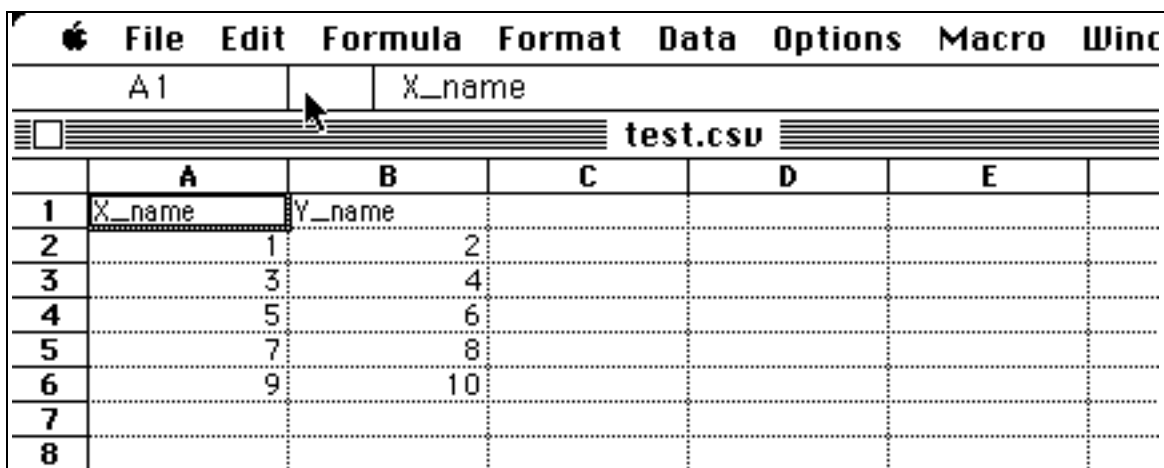
```
C:\>type testxy.csv
"X_name", "Y_name"
1 , 2
3 , 4
5 , 6
7 , 8
9 , 10
```

## PHARM/PCS Version 4.2 User Guide Supplement

```
C:\>type file3.xyz
"Time (hr)","Cp (mg/l)","Amount (mg)"
1 , 100 , 5
2 , 85 , 6
3 , 55 , 4
4 , 30 , 2
C:\>
```

### 2. Using Microsoft Excel with PHARM/PCS

You may import PHARM/PCS data files into Excel (PC or Macintosh). However, you must rename your files with the ".CSV" (comma separated values) extension. Just select Open under the File menu and select your PHARM/PCS file. The TESTXY.CSV file will appear....



	A	B	C	D	E
1	X_name	Y_name			
2	1	2			
3	3	4			
4	5	6			
5	7	8			
6	9	10			
7					
8					

Exporting Excel data in PHARM/PCS format is simple - just select *Save* under the File menu if you are working on a file loaded as a CSV file. Otherwise, select *Save As* and select the comma separated value format.

### 3. Using Lotus 1-2-3 with PHARM/PCS

You may import PHARM/PCS files into Lotus 1-2-3 using the *File Import Numbers (/FIN)* command. Lotus will list all ".PRN" (print) files, but any ASCII file such as a PHARM/PCS data file may be imported, provided you type the filename. The test "XY" file will appear as follows...

## PHARM/PCS Version 4.2 User Guide Supplement

```
Al: 'X_name'                                READY
Enter name of file to import: C:\LOTUS\*.prn
TEST.PRN
      A          B          C          D          E          F          G
1  X_name      Y_name
2          1          2
3          3          4
4          5          6
5          7          8
6          9         10
7
8
```

You may modify the file and then export it back to the PHARM/PCS file format by using the `Print File (/PF)` command. However, Lotus 1-2-3 does not create the necessary comma delimited format - you have to add the comma yourself. Just insert a new column (`/WIC`) B, add commas, and add quotation marks around the column labels. Your modified file should look like the following before saving it with the `/PF` command...

```
Al: '"X_name"'                                READY
Enter print file name: C:\LOTUS\new.xy
      A          B          C          D          E          F          G
1  "X_name" ,      "Y_name"
2          1 ,          2
3          3 ,          4
4          5 ,          6
5          7 ,          8
6          9 ,         10
7         11 ,         12
8         13 ,         14
9
10
```

You will have to specify the range to "print."

Note: unless you specify the extension, Lotus will save the file with the ".PRN" extension.

## **Appendix - Error Codes**

If you experience an unexpected error message such as the following, refer to the error code list, below. If you are unable to resolve the problem, please mail the "error report" to MCS.

```
*** Error # 53 on Line # 555 *** U%= 0 IZ%= 20 JZ%= 10 L%= 0
FI$=FILE1.XY MEM= 23930 PCS#4250000 12/12/89 C:
PLEASE PRINT THIS SCREEN TO DOCUMENT THIS ERROR.
Press <RETURN> to continue ?
```

You may print the error report by pressing the "print screen" key on your keyboard (refer to your computer's DOS manual). When you press <RETURN> to continue, PHARM/PCS will abort whatever procedure you were in and return to the Procedure menu.

3 Return without GOSUB	54 Bad file mode
4 Out of data	55 File already open
5 Illegal function call	56 Field statement active
6 Overflow	57 Device I/O Error
7 Out of memory	58 File already exists
9 Subscript out of range	59 Bad record length
11 Division by zero	61 Disk full*
14 Out of string space	62 Input past end of file
16 String formula too complex	63 Bad record number
19 No resume	64 Bad file name
20 Resume without error	67 Too many files
24 Device timeout	68 Device unavailable
25 Device fault	69 Comm-buffer overflow
27 Out of paper	70 Permission denied
39 Case Else expected	71 Disk not ready
40 Variable required	72 Disk media error
50 Field overflow	73 Advanced feature unavailable
51 Internal error	74 Rename across disks
52 Bad file name or number	75 Path/File access error
53 File not found	76 Path not found

## **INDEX**

Accuracy, 8-9  
Advantages, 8  
Antilog, 7  
ASCII files, 10-12  
Autoexec.bat, 3  
Backup, 3  
BASIC, 8-9  
Binary coded decimal, 8  
Comma separated values, 11-12  
Configurations, 9  
Directories, 4, 10  
Errors, 14  
Excel, 9, 12  
Export data, 9-10, 12-13  
Extension, 11-13  
Filename, 11-12  
GWBASIC, 8  
Header, 11  
Import data, 9, 12  
Install, 3  
Interpreted BASIC, 8-9  
Logarithm, 6-7  
Macintosh, 2, 12  
Memory, 2, 8-9, 14  
Merging, 9  
MKDIR, 4  
Monitor, color and mono, 2, 5  
Print, 2, 10  
RAM, 2  
README.PCS, 3  
Reciprocal, 7  
Registration, 2  
Save, 4, 7, 9, 12-13  
Softpc, 2  
Subdirectory, 3-4, 9  
Transform, 6-7  
Unexpected error, 14  
Variables, 5-6, 11  
Version Maintenance, 5  
XYZ data, 11-12