Doors CS 7.2
Unabridged Manual

DOORS CS 7.2 MANUAL

Kerm Martian and Cemetech
http://dcs.cemetech.net

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CHAPTER 1
QUICK START GUIDE

1.1 | Prerequisites

Before you can install Doors CS, you must first unzip the file you downloaded. If your computer is running Microsoft Windows XP, you can simply double click this file and select the "Extract All" tab on the side of the screen. Once you have done this, proceed to the "Transfer" Section.

If you are not running Microsoft Windows XP, Vista, 7, or 8 (or newer), you may need to use software such as WinZip or 7-zip to unzip the files. Follow the instructions included with your program to extract the files, then proceed to the transfer step. Mac OS X and Linux generally have built-in unzipping tools.

1.2 | Transfer

Once you have unzipped Doors CS, you can begin the transfer. On Windows or Macintosh machines, you will probably do best with TIConnect software, available from Texas Instruments or on the CD that came with your calculator. For Linux based computers, a number of utilities exist and can be found at Ticalc.org.

1.2.1 | TI-Connect Instructions

1. Run TIConnect from your Start menu.
2. Select the "Device Explorer" button.
3. Select the proper device from the list (Calculator should be plugged in)
4. Open the folder to which you extracted Doors CS.
5. Inside this folder, select the appropriate version of DCS, based on your calculator model.
6. Drag and Drop the file DoorsCS7.8xk from the folder to the TIConnect Device Explorer.
7. Follow the TIConnect prompts to send the file to your calculator.

1.2.2 | Alternate Instructions

1. Find the appropriate file inside the ZIP file: DoorsCS7.8xk.
2. Copy it to your desktop
3. Attach calculator and turn it on
4. Right click on file and select Send to TI Device.
5. Select appropriate connection
6. Click on Send to Device to begin transfer

1.3 | First Use

Sending the file to your calculator installs it; no further installation is necessary. To run Doors CS at any time, press the blue Apps key(83+) or purple Apps key(84+) on your calculator, and

either use the arrows to select **DoorsCS7** and press [ENTER] or press the number corresponding to the **DoorsCS7** entry in the menu. The first time that you run Doors CS, it will invisibly install an AppVar that contains default preferences. You can edit these preferences via the submenus of the DCS Menu in the lower left of the Doors CS desktop

1.4 | Usage Overview

1.4.1 | Keys and Shortcuts

To navigate Doors CS, use the mouse cursor, controlled by the four arrow keys on your calculator. To normal or "left" click, press the [TRACE] or [2nd] keys. To secondary or "right" click, press the [GRAPH] or [ALPHA] keys. You can turn your calculator off from Doors CS by pressing the [ON] key; press it again to turn the device back on. [CLEAR] quits immediately back to the TI-OS homescreen from the Doors CS desktop.

Key	Function
Arrows	Move cursor
[Trace] or [2nd]	Left-click
[Graph] or [Alpha]	Right-click
[Clear]	Quit
[+]/[−]	Scroll down/up on the desktop or from any Open File or Save File As… dialog
[*]/[/]	Scroll fast down/up (2, 3, or 4 pages at a time)
[ON]	Turn calc on/off
[4] [5] [6]	Run the programs on the top row of the desktop
[1] [2] [3]	Run the programs on the bottom row of the desktop
[Y=]	Open the DCS Menu
[Window]	Go to parent folder
[STAT]	Tab forward
[XT0n]	Tab backward
Hold [ON], tap [PRGM]	Open DCS (only from TI-OS, if "[ON] hooks" option enabled
Hold [ON], tap [STAT]	Immediately APD (only from TI-OS, if "[ON] hooks" option enabled.

1.4.2 | Areas of the Screen

In the main area of the desktop are up to six icons representing programs or files on your calculator, accompanied by filenames of up to eight characters. You can left-click on any compatible file to run it. If Doors CS cannot run a file for some reason, whether due to incompatibility or corruption, it will alert you to this fact. When you finish using a program, it

should return you to the Doors CS desktop. You can also right-click on files to edit their options or create folders.

At the right side of the screen is the scrollbar. You can expedite scrolling by using the `[-]` and `[+]` keys to go one page up and one page down respectively. You can also click on the bar itself to scroll down one page, or click the arrows at each end of the bar. The lower right of the screen contains, from left to right, the free RAM meter, the battery power meter, and the close button. The close button is equivalent to pressing `[CLEAR]`.

The bottom left of the screen contains the icon seen in the top left of this page, the Doors CS Menu, usually abbreviated as the DCS Menu. This provides access to options and advanced features of Doors CS. Some provide redundant access to features for those familiar with desktop computer interfaces. You can read more about the DCS Menu later in this manual.

1.5 | Quick-Start Conclusion

You now have a working knowledge of utilizing Doors CS and its features. You are welcome to comment, ask questions, suggest features, or just make your voice heard on the Cemetech Forum (http://www.cemetech.net/forum), or send an email to dcs@cemetech.net. Good luck with Doors CS!

CHAPTER 2
INTRODUCTION & INSTALLATION

2.1 | A Brief Introduction to Doors CS

Doors CS is a shell and GUI for TI graphing calculators, namely the TI-83, TI-83+, TI-83+ Silver Edition, TI-84+, and TI-84+ Silver Edition. It also has been tested and optimized to work on the TI-84+ keypad for the TI-Nspire calculator. Put simply, Doors CS lets you run any kind of program on your calculator, whether it is written in z80 Assembly or TI-BASIC, or meant for a shell like MirageOS or Ion, or to use libraries from xLib, Celtic III, or PicArc. Doors CS is built to be extremely user-friendly, using a mouse-based interface to appeal to users used to using computers who are frustrated by the infinite menus one must navigate on a TI calculator. On the opposite end of the user spectrum, it includes myriad keyboard shortcuts so that those who prefer to use a keyboard to a mouse can quickly and efficiently move through Doors CS.

Doors CS 7 is among the larger Apps for TI calculators, weighing in at three "pages" or 48KB, but it packs together the features of many other apps:

- The program execution capabilities of Doors CS 6, Ion, and MirageOS
- The assembly libraries of Doors CS 6, Ion, and MirageOS
- The BASIC libraries of xLib, Celtic III, and PicArc
- The homescreen execution features of Noshell

And many others. I hope that you will get plenty of good use out of Doors CS, and that you'll stop by http://www.cemetech.net/forum to chat, ask questions about Doors CS, learn about programming for it, and check in for new versions of Doors CS. You can also find information on Doors CS at http://dcs.cemetech.net.

2.2 | Installing Doors CS

Installation of Doors CS is as simple as sending DoorsCS7.8xk to your calculator. However, feel free to read on for more detailed instructions if you need them. Also note that you can just as easily get Doors CS 7 from a friend or classmate's calculator over a calculator-to-calculator transfer cable. However, it is recommended that you download your own copy from http://dcs.cemetech.net to be sure you're getting the latest version.

2.2.1 | What Do I Need to Install Doors CS?

First and foremost, you'll need a TI-83+, TI-83+ Silver Edition, TI-84+, TI-84+ Silver Edition, or TI-Nspire with a TI-84+ keypad. You will also need at least 48KB of archive free for Doors CS itself, as well as 80 bytes of RAM for its AppVar. Finally, you'll need transfer software like TIConnect or TiLP II, plus a transfer cable to connect to your calculator. If all you have is the cable that connects your calculator to another calculator, you'll need to get a friend to load Doors CS 7 on his or her calculator, then get it from them.

TIConnect and TiLP each have their own manuals for installation. They're both fairly straightforward, although installing them on Windows 7 and on 64-bit machines is known to be somewhat tricky. You can get TIConnect for Windows and for Mac OS on Texas Instruments' website. If you have Linux/Unix, or you have Windows or Mac OS and you prefer an open-source software alternative, you can try TiLP II at ticalc.org.

If you are reading this document, chances are that you successfully unzipped the Doors CS zip that you downloaded. If not, you'll need software such as WinZip or 7-zip to unzip the files. Follow the proper steps for your program to extract at least DoorsCS7.8xk, then proceed onwards.

2.2.2 | Installing Doors CS On Your Calculator

If you are using, TIConnect, follow the section immediately after this paragraph. You can also follow the second set of instructions, which are slightly faster but more confusing for the novice TIConnect user. If you are using TiLP II or other third-party transfer software, please follow your software's manual for transferring a program to your calculator.

TI-Connect Instructions

1. Run TIConnect from your Start menu.
2. Select the "Device Explorer" button.
3. Select the proper device from the list (Calculator should be plugged in)
4. Open the folder to which you extracted Doors CS.
5. Inside this folder, select the appropriate version of DCS, based on your calculator model.
6. Drag and Drop the file DoorsCS7.8xk from the folder to the TIConnect Device Explorer.
7. Follow the TIConnect prompts to send the file to your calculator.

Alternate TI-Connect Instructions

1. Find the appropiate file inside the ZIP file: DoorsCS7.8xk.
2. Copy it to your desktop
3. Attach calculator and turn it on
4. Right click on file and select Send to TI Device.
5. Select appropriate connection
6. Click on Send to Device to begin transfer

CHAPTER 3
USAGE OVERVIEW

3.1 | Running Doors CS

Launching Doors CS is easy, and can happen one of three ways. The standard way to run Doors CS is to press the [APPS] key on your calculator, then either use the arrows to scroll down to **DoorsCS7** and press enter, or press the number next to **DoorsCS7**, in this case the [2] key (although that may be different on your calculator depending what other applications you have installed). Doors CS will start executing and bring you to the DCS desktop.

Figure 1: *Running Doors CS from the Apps menu*

Once you have set up your Doors CS settings, you have the option of running Doors CS from the TI-OS by holding [ON] and tapping the [PRGM] button. You can also choose to make Doors CS start automatically when your calculator turns on. See 3.4.4, The Options Menu, for more information.

Note that if your calculator has reset since the last time that you used Doors CS, or the **DCS7** AppVar has been deleted for some reason, Doors CS will attempt to rescue your settings from the **DCS7b** AppVar. It will also try to use the **FLDSV7** AppVar to rebuild your folder structure and put your programs back into their folders, a feature called FolderRestore.

3.1.1 | First Use

The first time that you run Doors CS 7, you will be presented with a window similar to the following, introducing Doors CS, its author, the website to get help, and the version of the Doors CS install that you have on your calculator.

Figure 2: *First-time use splash screen*

3.2 | The Doors CS Desktop

The Doors CS desktop is where most of your time will be spent while using Doors CS, other than in running programs that Doors CS has launched directly or indirectly. It follows a straightforward layout centered around one to six files, folders, or programs at a time, and includes a scrollbar on the right side of the screen and a taskbar at the bottom of the screen.

Figure 3: *Sample Doors CS desktop*

3.2.1 | Areas of the Desktop

The Doors CS desktop is navigated using a mouse cursor; the arrows move it around, **[TRACE]** or **[2nd]** acts like a left-click, and **[GRAPH]** or **[ALPHA]** acts like a right-click. For users who prefer not to use a mouse, there are plenty of shortcuts, as well as a feature called TabFuncs. To use TabFuncs, press **[XT⊙n]** and **[STAT]** to move around the desktop, and **[2nd]** or **[ALPHA]** to left-click or right-click, respectively. You can click on any program, file, or folder to launch it, or right-click on any program, file, or folder to open the Properties menu.

Click either of the arrows on the scrollbar to scroll up and down, or in the middle of the scrollbar to scroll down. If you are in a folder, you can click on the taskbar to go up to the parent folder. You can hover over the Memory Meter to view the RAM and ROM levels of the calculator, or hover over any program to see its size and description.

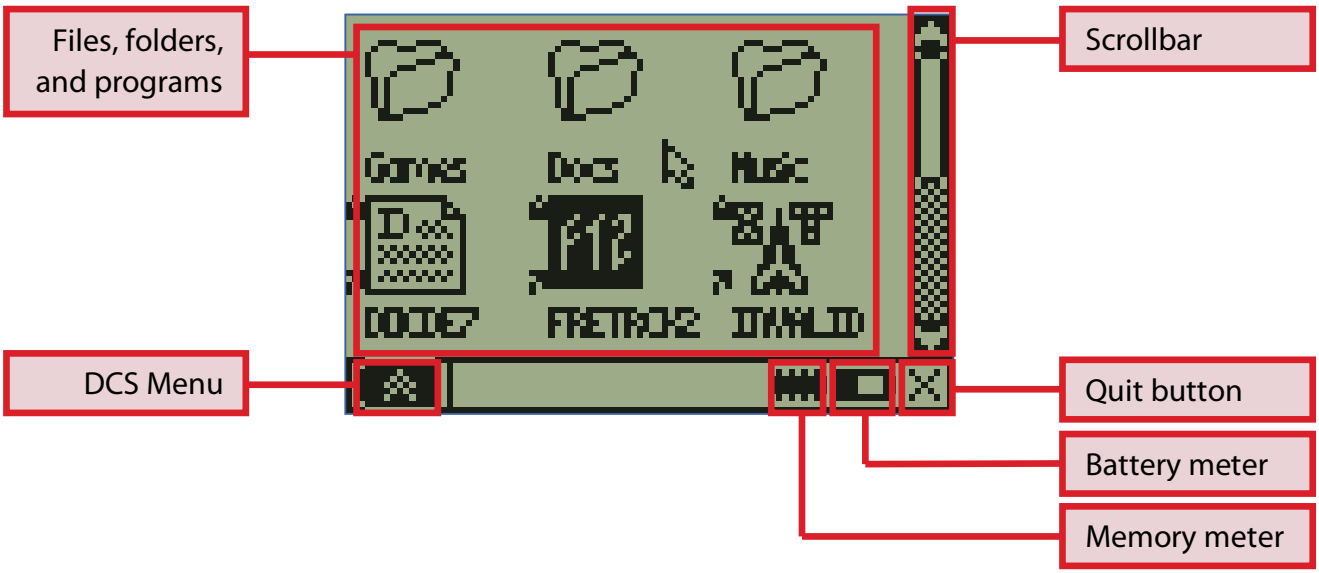

Figure 4: *Detailed DCS desktop view*

3.2.2 | Files and Programs

Doors CS displays programs and folders in alphabetically-sorted order, up to six at a time. You can click on any folder to enter it, and program to run it, and right-click on any file or folder to bring up the properties menu for that item. If a program has a small lock icon at the upper-left of its icon, it is edit-locked (although you can still open it with Doors CS' Edit feature). If it has a small arrow at the lower-left of its icon, it is stored in ROM or Archive; otherwise, it is in RAM. You can use the Properties menu to lock or unlock programs, and to archive or unarchive programs. Edit-locking or archiving folders has no effect. You can also hide programs from the TI-OS with the Hide feature; if a program is hidden, a small H appears next to its icon in Doors CS.

3.2.3 | Keyboard Shortcuts

Doors CS has an extensive set of keyboard shortcuts to make it easier to use, as enumerated in the table below. The mouse is moved using the arrows, **[2nd]** or **[TRACE]**/**[F4]** left-click, and **[ALPHA]** or **[GRAPH]**/**[F5]** right-click. You can run the onscreen programs or files or folders using the **[1]** to **[6]** numbers (see below for details). **[+]** and **[−]** are used to scroll one page at a time down or up, while **[*]** and **[/]** scroll two, three, or four pages at a time, depending on how many programs are in the current folder (two pages if fewer than 36 programs, three pages if fewer than 60 programs, four pages if at least sixty programs). **[Y=]**/**[F1]** opens the DCS Menu at lower-left, and **[WINDOW]**/**[F2]** goes up to the parent folder from a subfolder. You can quit from anywhere in the Doors CS desktop instantly using **[CLEAR]**. **[XT⊙n]** and **[STAT]** are used to tab around if you prefer not to use the mouse, you can use **[ON]** anywhere there's a mouse to turn the calculator off and on. If you have the "[ON] hooks" option in the Options window checked, you can hold **[ON]** and tap **[PRGM]** to launch DCS from the TI-OS, or hold **[ON]** and tap [STAT] to APD.

Key	Function
Arrows	Move cursor
[Trace] or [2nd]	Left-click
[Graph] or [Alpha]	Right-click
[Clear]	Quit
[+]/[−]	Scroll down/up
[*]/[/]	Scroll fast down/up (2, 3, or 4 pages at a time)
[ON]	Turn calc on/off
[4] [5] [6]	Run the programs on the top row of the desktop
[1] [2] [3]	Run the programs on the bottom row of the desktop
[Y=]	Open the DCS Menu
[Window]	Go to parent folder
[STAT]	Tab forward
[XTΘn]	Tab backward
Hold [ON], tap [PRGM]	Open DCS (only from TI-OS, if "[ON] hooks" option enabled
Hold [ON], tap [STAT]	Immediately APD (only from TI-OS, if "[ON] hooks" option enabled.

3.3 | The Properties Menu

The Properties menu, as its name implies, lets you modify the properties of files, programs, and folders, as well as delete items, create folders, edit programs, and copy and paste. If you right-click on any file or folder, you will be presented with the following menu:

Figure 5: *The Properties menu*

The items in the Properties menu can be used as follows:

- **Delete:** Delete the specified file or folder. If you delete a folder, all of its contents are moved to that folder's parent. Please note: there is NO confirmation. Files are deleted permanently!
- **Lock:** Toggle the current file or program's edit-lock status.
- **Archive:** Move a file or program from RAM to Archive or Archive to RAM.
- **Copy:** Create a duplicate of the current program in this folder. Doors CS will prompt you for the name of the new program, which must be unique.

Figure 6: *Filename input box for copying programs*

- **Cut:** Cut the current folder or program so it can be pasted into another folder. The program or folder will stay put until you paste it.
- **Paste:** Paste the file, folder, or program that you cut into the current folder. Note that right-clicking on a folder and choosing Paste will **NOT** paste into that folder! It will paste into the current folder.
- **Folder:** Create a new folder in the current folder. A folder name input box will pop up as per Figure 6.
- **Rename:** Rename the current program.
- **Hide:** Hide the current program or file from the TI-OS.
- **Edit:** Open the current program in an 8-line editor, regardless of edit-lock status or archive status.

3.4 | The DCS Menu

The Doors CS Menu or DCS Menu lets you modify common Doors CS settings or access help on using Doors CS. When you click on the DCS Menu icon in the lower-left of the Doors CS desktop, the DCS Menu will appear. Click on the icon again or anywhere outside of the menu to collapse it again.

Figure 7: *The DCS Menu*

Click any item to open the window for that item. You can also press **[CLEAR]** to immediately quit from Doors CS, just as if you were on the desktop.

3.4.1 | The Display Menu

The display menu lets you change the contrast of the calculator's LCD by moving the Contrast slider to the left or right. You can also choose whether or not Doors CS sorts your programs alphabetically; if you disable alpha sorting, programs will be displayed in VAT order. Finally,

TI-84+ and TI-84+ Silver Edition users can benefit from the Retune button, which will automatically fix the display if it appears skewed, corrupted, or out of sync.

Figure 8: *The Display menu*

When you have finished editing Display options, click OK to return to the DCS menu, or Cancel to undo your changes (except for Retuning, which cannot and should not be undone).

3.4.2 | The About Window

The About window is a duplicate of the window shown when Doors CS first launches. It contains the author's name, the current DCS version, and the URL of Cemetech, to which you should go if you need help with Doors CS.

Figure 9: *The About Window*

3.4.3 | The Help Menu

By popular demand from users and beta-testers, Doors CS 7 contains a Help Menu with information on keyboard shortcuts, BASIC library support, the URL for full DCS documentation, and the URL to ask for help with Doors CS.

Figure 10: *The Help Menu*

3.4.4 | The Options Menu

Other than display options, most of the Doors CS settings and options can be modified from the Options menu. Click any checkbox to toggle its status, the arrows in the spinner boxes to

change the number in the box, the OK button to store your changes, or the Cancel button to revert you changes. You can reset the DCS cursor to the default with the Default button, or use the Cursor... button to bring up the cursor editor.

Figure 11: *The Options Menu*

- **Accelerate:** If checked, the cursor will accelerate to make moving around the screen both fast and precise. The first number changes the delay before acceleration; higher makes the mouse more precise, while lower makes it faster. The second number sets the acceleration rate; if you set it to its maximum, then the mouse will jump immediately to top speed. The default is 9@3, which provides a good balance between speed and accuracy.
- **Back up folders:** If checked, Doors CS will use the FolderRestore feature to automatically back up your folders and their contents. If your calculator crashes, Doors CS will recreate your folders and repopulate them. Only disable this if you have many programs and backups are slow.
- **Back Up:** If you have disabled automatic backups, click this button to manually create a backup of the current folder structure, including folders, hierarchy, and contents.
- **Launch DCS at Startup:** If this box is checked, Doors CS will launch immediately when you turn on your calculator.
- **Enable TI-OS Lowercase:** If this checkbox is enabled, you can press **[ALPHA]** twice while in the TI-OS to type lowercase letters.
- **XLib/Celtic III Compatibility:** Doors CS contains full support for xLib/Celtic III/PicArc libraries. If checked, this functionality will be enabled while running BASIC programs.
- **[ON] Hooks:** If checked, you can hold **[ON]** and tap **[PRGM]** from the TI-OS to quickly launch Doors CS. You can also hold **[ON]** and tap [STAT] from the TI-OS to immediately APD: in other words, you will be exactly where you were when you turn the calculator back on. This is useful, for example, if you are editing a long BASIC program and don't want to lose your place.
- **HomeRun Hook (Parser Hook) :** This checkbox enables Doors CS' Homerun feature, which lets you run ASM and BASIC programs of any type, including archived programs, from the TI-OS homescreen just by executing prgmNAME.

3.4.5 | The Cursor Editor

The Doors CS cursor editor lets you modify your cursor. Black is black, white is white, and gray is transparent. Use the arrows to move, **[2nd]** to set a pixel to black, **[ALPHA]** to set a pixel

to white, and **[DEL]** to set a pixel to transparent. Press **[ENTER]** to save your changes. You can reset the default cursor with the Default button.

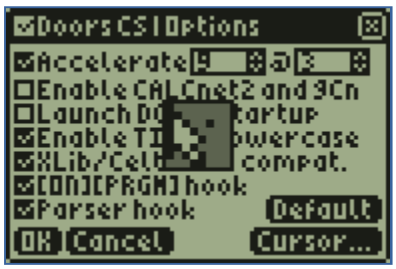

Figure 12: *The cursor editor*

3.5 | Running Programs from the TI-OS Homescreen

Doors CS 7 contains a feature called Homerun that lets you run BASIC and ASM programs of any type, including MirageOS, Doors CS, nostub, and Ion, and any status, including archived or locked, directly from the TI-OS homescreen. The feature is enabled if you check the Parser Hook option in the Options menu. Simply go to the Program menu of the TI-OS and run a program as if it was an unarchived BASIC program, regardless of its type and status, and Doors CS will take care of the rest.

3.6 | Interacting with DCS GUI Program

Assembly programs (since Doors CS 6) and BASIC programs (starting in Doors CS 7) can interact with and use Doors CS' powerful GUI API that lets programmers create and populate windows and invite users to interact with such GUIs. Using these GUIs is as simple as using Doors CS itself. The same keyboard shortcuts apply, including the keys to move the mouse and click, **[CLEAR]** to exit any small window, and interactions with text input boxes. The following three screenshots are examples from the ASM text editor Document DE 7, available at Cemetech. The middle screenshot shows the Save File As... dialog, while the rightmost shows the Open File... dialog.

Figure 13: *Sample DCS GUI API interfaces*

3.6.1 | Text Editing

Doors CS lets you input text in three ways: single-line text input boxes, password input boxes, and multiline text input boxes. For each of these, you can click inside the box to move from mouse mode to text-editing mode, then click again to return to mouse mode. Typing is

intuitive; press any key to type its corresponding alpha character. The **[ALPHA]** key switches between three input modes: uppercase letters, lowercase letters, and numbers and symbols. These are represented respectively by a small **A**, **a**, or **1** that will appear in the upper-right of the screen.

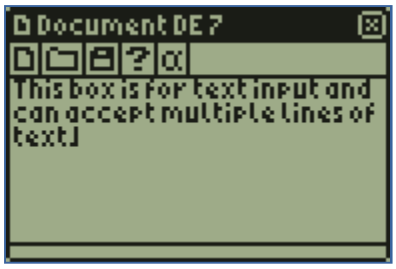

Figure 14: *Sample multiline text input box*

The following are the characters that can be entered in each mode:

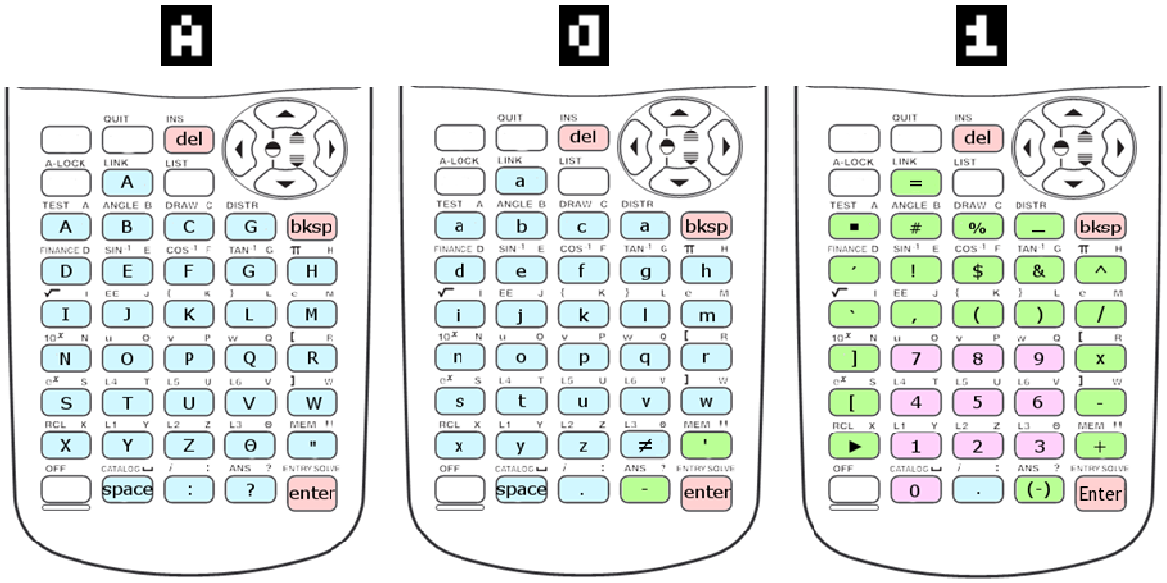

Figure 15: *Text input characters in each mode*

3.7 | Easter Egg

Did you really expect me to reveal it? Happy hunting.

Chapter 4
Frequently-Asked Questions

What does DCS / Doors CS stand for?

DCS or Doors CS stands for "Doors Calculator Shell." Many other TI shells call themselves "OS", such as MirageOS and CrunchyOS, but this is a misnomer. When you use any Application, the TI-OS is still the operating system, and Doors CS or MirageOS or CrunchyOS is the shell, hence Calculator Shell.

Where can I get more information/help with Doors CS?

You can read more documentation as well as access the full Doors CS Software Developers' Kit at http://dcs.cemetech.net. You can ask questions and get help at http://www.cemetech.net/forum.

Doors CS should have [feature]. Why doesn't it?

Because you didn't come to the Cemetech forum and suggest it. http://www.cemetech.net/forum should be your next destination.

I want to make programs for Doors CS.

Great! Whether you're a BASIC or assembly programmer, Doors CS has tons of features to offer you over programming with just the TI-OS or for another shell like MirageOS or Ion. Doors CS lets BASIC programmers add icons, hide subprograms, automatically unarchive subprograms, use the DCS GUI API and other DCSB Libs, and access all of the functionality of xLib, Celtic III, and PicArc without needing any of those applications on the user's calculator. Doors CS offers ASM programmers all the functions available in Ion and MirageOS plus a powerful GUI API, an Associated Program system to connect files with their reader/editor program or levels and save files with their associated game, the capabilities to create Shell Expansions to extend Doors CS itself, and much much more.

You can read about all the different programming features that Doors CS offers at http://dcs.cemetech.net. You can ask questions about writing programs on the Cemetech forum at http://www.cemetech.net/forum.

Where can I download games and programs?

You can get tons of programs at games for Doors CS at http://www.cemetech.net/programs. However, the largest repository of programs and games for TI calculators is at ticalc.org: http://www.ticalc.org/pub/83plus.

CHAPTER 5
FEATURES AND SPECIFICATIONS

5.1 | Supported Filetypes

	TI-83	TI-83+/SE	TI-84+/SE/Nspire
Doors CS 5-6 ASM Programs[1]	(5 only)	•	•
Ion 1.0-1.6 ASM Program	•	•	•
TI-OS ASM Program	•	•	•
TI-OS BASIC Program	•	•	•
SOS ASM Program	•		
AShell ASM Program	•		
MirageOS ASM Programs[1]		•	•
MirageOS BASIC Programs	•	•	•
(Varies) Doors CS 4-5 BASIC Programs	•	•	•
(Varies) Doors CS 6 BASIC Programs		•	•
xLib/Celtic III/PicArc Programs		•	•
Axe Source File		•	•

5.2 | Specifications

- **Source Language** z80 assembly for TASM/Brass
- **Compiled Format** z80 machine language
- **Total Size (Unassembled)** ~665KB, 47 source files
- **Total Size (Assembled)** 48KB, 1 8xk Intel-coded hex file
- **Total App Size (Used/Free)** 48,465 bytes / 687 bytes

5.3 | Tools for Programmers

Doors CS contains myriad features for both ASM and BASIC programmers, in terms of editing tools, icons, descriptions, libraries, and much more. You can learn all about the SDK in the included dcs_sdk.zip file that should have come with this zip and manual. If you didn't get the SDK with Doors CS, go to You can also visit http://dcs.cemetech.net for more information, or stop by http://www.cemetech.net for programming help.

5.4 | List of Features

5.4.1 | General Doors CS 7.0 Shell Features

- Shell and GUI for managing and running any available BASIC and ASM program on TI graphing calculators
- Mouse-based interface is intuitive for modern computer users and calculator enthusiasts alike.
- Rock-solid stability from months of community beta-testing.
- Powerful built-in libraries for ASM and BASIC programmers.
- Folder-based organization system lets you find programs quickly and easily.
- Built-in file management tools make renaming, copying, deleting, locking, archiving, and hiding a breeze.
- Built-in 8-line BASIC editor can even edit archived and locked BASIC programs
- Extensive keyboard shortcuts for power users.
- Rendundancy and backup systems restore your folder organization and preferences should your calculator crash.
- TI-OS integration adds features like running any program directly from the homescreen, keyboard shortcuts to APD or launch Doors CS, and more.
- Wide compatibility with existing MirageOS, Ion, xLib, Celtic III, PicArc, Omnicalc, Doors CS 5/6, and TI-OS programs and features.
- In-shell battery and memory meter as well as low RAM/battery warnings.
- Hover over programs to see their size and description with the InfoPop feature.
- MemoryPop lets you see your RAM and ROM usage in Doors CS by hovering over the memory meter.

5.4.2 | Program-Related Features

- Intelligent Writeback extends your flash ROM's lifetime and reduces Garbage Collect messages by only overwriting archived programs after execution if they have changed.
- Doors CS' Associated Program feature lets you open files with their viewer, like clicking a document to open it with a word processing program, or a game level to open it in its game.
- HomeRun feature can run any BASIC or ASM program, archived, locked, or otherwise, from the TI-OS homescreen simply by executing prgmNAME.

- Instant Goto replaces the TI-OS' slow Goto feature, and uses Doors CS' 8-line BASIC editor.
- Archived programs are kept in ROM during execution, so ASM program crashes will not delete the program.

5.4.3 Customization Features

- Users can modify their mouse cursor, acceleration speed, folder backup preferences, and many other options and settings.
- Rename any program, including ASM programs, from within Doors CS
- Supports custom backgrounds on the Doors CS desktop
- Users can easily add an icon and description to any existing BASIC program
- Shell Expansions provide additional functionality to Doors CS, such as password protection or a clock.

5.4.4 Compatibility

- Runs MirageOS ASM programs and displays their icons
- Runs MirageOS BASIC programs; InfoPop recognizes MirageOS program descriptions
- Runs nostub (TI-OS) ASM programs and Ion ASM programs
- Has built-in BASIC libraries for BASIC programs using xLib, Celtic III, PicArc, Omnicalc, and DCSB Libs.

5.4.5 Features for ASM Programmers

- Full set of Ion and MirageOS libraries to support new and existing programs.
- Extensive GUI system allows stacked windows, mouse input, text input, forms, and more for DCS7 ASM programs in an extremely simple API.
- Associated Program functionality seamlessly passes files to their respective viewer programs, and handles archiving/unarchiving and cleanup.
- Built-in FileOpen, FileSave, and FileSaveAs GUIs make the creation of small, powerful AP programs possible.
- Shared libraries called Appended Library Extensions can be used to provide networking, 3D graphics, and grayscale support.

5.4.6 Features for BASIC Programmers

- Full compatibility with popular xLIB library without needing to keep the 16KB app on your calculator. Doors CS versions of xLIB routines are faster, safer, and more optimized
- Full compatibility with popular Celtic III, PicArc, and Omnicalc libraries, also built-into Doors CS 7 and optimized for speed and stability.
- Powerful DCSB Libs introduced in Doors CS 7 provide access to advanced features, the Doors CS GUI system, stack structures for the Ans variable, and more.
- Simple addition of icons and descriptions to programs without breaking compatibility or functionality
- Hide programs from Doors CS, or specify a set of subprograms that are automatically unarchived when a BASIC program is run.

CHAPTER 6
FURTHER READING

The most important place to get information about Doors CS is the Doors CS Wiki, http://dcs.cemetech.net/. The second most important place is the Cemetech website and the Cemetech forums, where news about new versions, features, and programs is posted, and where users and programmers alike can ask questions about the shell. The front page is http://www.cemetech.net, and the Doors CS subforum can be found at http://www.cemetech.net/forum/viewforum.php?f=9. General information about programming in z80 ASM and in TI-BASIC can be found at http://www.ticalc.org, and programmers are encouraged to ask programming questions and request advice on tutorials, project ideas, etc on the Cemetech forum.

As a last resort, you may hunt down my email address and drop me a line, but be advised that I will answer questions much faster when they're posted on the Cemetech forum, as I keep my eye on that much more frequently than I do my email.

Thanks for browsing this document, good luck with your TI programming endeavors, and I hope I get to hear from you on the Cemetech forum (http://www.cemetech.net/forum). Cheers!

APPENDIX A
LICENSE

Doors CS is updated regularly to fix any reported bugs and compatibility issues, optimize size, and add new features. You can find all Doors CS news at the Cemetech homepage, http://www.cemetech.net. If you sign up as a Cemetech user, you can view the project page with beta editions and more at http://dcs.cemetech.net. You can download this and all future editions of Doors CS at the Cemetech file archives or at the link above. If you have any comments, questions, complaints, or compliments on Doors CS, feel free to send me an email at kerm_martian@yahoo.com with the phrase "Doors CS" in the subject line.

The full Doors CS license is reproduced below:

Doors CS 7 End-User & Developer License

A.1| Preamble

This license applies to any and all possible pieces of human- and machine-readable computer data, code, prose, graphics, and other materials in the assembly, basic, and other languages, including associated documentation, ideas, and intellectual property created, designed, and/or written by Christopher Mitchell, programming alias KERM MARTIAN. This document governs the use of the compiled data, code, source, graphics, and other materials and intellectual property of the official Doors CS 7 beta, release candidate, and final releases. Any and all use and reuse of the Doors CS code for any purpose including but not limited to an unofficial release of a compiled version by "Kerm Martian" must follow this agreement. Any attempt to use or reuse the source code or compiled code for release under "Kerm Martian" or another name must be explicitly approved by "Kerm Martian", except if such use or reuse has been previously approved by "Kerm Martian". Previous approval does not guarantee future approval, and "Kerm Martian" may choose to revoke any and all permissions granted to other coders regarding use of the Doors CS code, data, or source including but not limited to circumstances of abuse or misuse.

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A.2| Source Availability

The Doors CS 6 source code shall be openly available to the general public after May 31, 2006. This availability cannot be applied to past or future Doors CS releases, although the author, "Kerm Martian", may choose to make such source code available at his own discretion. A release date, if any, for the Doors CS 7 source code has not yet been set. Appropriate notifications will be made should such a date be selected. Interested community members may request special access to the source code in whole or in part, which Kerm Martian reserves the right to approve or deny. Past access to any source code or subset thereof does in no way guarantee future access. When and if released, the source code may be found on Cemetech, http://www.cemetech.net, or http://dcs.cemetech.net. If the code is not found there, the author may be contacted to obtain the full source code. At any point, "Kerm Martian" may choose to return Doors CS to closed source status, in which state the code would not be released to any programmer, user, or other individual, corporation, or legal body whatsoever. Such a change would be accompanied by an updated license and at least 1-week notification on http://www.cemetech.net. This change would retroactively forbid derivative works based in whole or part on original code taken from Doors CS; in the event of such a move, an author could submit a written request to retain rights to the derivative code.

A.3| Scope

This license covers the electronically-encoded, hardcopy, and any other instance of the source and assembled code for the graphing calculator shell Doors CS, its derivatives, and its modules. This license does NOT cover any program written to work with Doors CS by either "Kerm Martian" or any other user, group, or organization. Certain portions of the code, including routines in whole or in part, have been used with the permission of the original third-party author(s). They may or may not be covered by original licenses. A user wishing to use that code should contact those authors for permission to use their code, or "Kerm Martian" may be able to contact the author on the user's behalf.

A.4| Usage

Under abolutely no circumstances whatsoever may the source code of Doors CS be recompiled in whole or in part and released by an individual, group, or third party other than "Kerm Martian" without express, expicit written permission from "Kerm Martian". Sections of code may be used in other published projects only with the written permission of "Kerm Martian". The source code of Doors CS may be freely examined and reverse-engineered only for constructive purposes. It is explicitly illegal and contrary to this agreement to use any of the information covered directly or indirectly by this agreement for malicious or harmful purposes.

Optimizations, corrections, and bugfixes to this code may be submitted to the author, "Kerm Martian". Such items may be accepted or denied as additions or changes to the official source code maintained by "Kerm Martian" for official releases at "Kerm Martian"'s discretion. As a general rule, good, constructive suggestions will be almost definitely accepted.

Doors CS itself is not for use for academic dishonesty or malicious or illegal activities. Such uses are a violation of this license agreement; such a violation nullifies the user's license to this program and requires its immediate removal as per section A.1 of this agreement.

A.5| Liability

Cemetech and "Kerm Martian" hereby disclaim any and all responsibility for damage and/or injury to persons or property, both tangible and intangible, as a direct or indirect result of using Doors CS 7. Among the implicit areas of non-liability deemed necessary for explicit statement here are "RAM Cleared" events, rendering of a mobile unit nonfunctional ("bricking"), and unwanted additional, removal, or modification of data on a device due directly or indirectly to Doors CS 7, though all reasonable care has been taken to remove instability from this final release.

A.6| Updates

Frequent changes are made to the Doors CS source code as development progresses. These changes are mirrored in the released source code, but there might be a slight delay due to scheduling or "Kerm Martian" forgetting to upload the source on any given week. New source code releases are generally made after major changes or the addition of new features, and do not occur after minor bugfixes. If you need an up-to-date version, contact "Kerm Martian".

No implied or express warranty is provided as to the frequency of updates to Doors CS to add additional features, update existing features, repair bugs, or modify any other aspect or functionality of Doors CS, its documentation, and its developer tools.