# WELCOME TO PGSS™

• **What is PGSS™?**

PGSS™ is a personal golf score management program, designed to provide an informative statistical record of your performance on the links. Once a PGSS™ file for a course has been created, you just enter your scores and PGSS™ does the rest.

In addition to allowing you to save, sort, and view individual scorecards (up to 500 per course file), PGSS™:

— Compiles and displays a distribution of your scores in terms of eagles, birdies, pars, bogeys, double bogeys, triple bogeys, and others. It does this for each hole, the front and back nines, and the entire course.

— Calculates and displays your scoring average for each hole, the front and back nines, and the entire course.

— Determines and displays your high and low scores for each hole, the front and back nines, and the entire course.

— Computes and displays the amount by which you play each hole, the front and back nines, and the whole course over or under par.

By selecting items from the PGSS™ menu bar, you can also get the following information:

— An index of the scorecards in your course file, based on the order in which they are currently sorted.

— An analysis of an individual round, broken down in terms of the number of eagles, birdies, pars, bogeys, double bogeys, triple bogeys, and others you scored on par 3s, par 4s, and par 5s.

— An analysis of your scoring on the course, broken down in terms of the number and percentage of eagles, birdies, pars, bogeys, double bogeys, triple bogeys, and others you scored on par 3s, par 4s, and par 5s. In addition, the amount by which you play each kind of hole over or under par is calculated and displayed.

— A distribution of your scores for individual holes, the front or back nines, or the entire course, including the dates on which you last shot a particular score.

— A sorted ranking of the holes of a course in terms of their difficulty, i.e., how much you play them over or under par.

— A sorted ranking of the holes of a course in terms of the percentage with

which you eagle, birdie, par, bogey, double bogey, triple bogey, or other them.

— A summary of up to fifty of your previous rounds on a course, displaying your scoring distribution, scoring average, high and low scores, and par differential on a hole-by-hole and total basis.

To assist you in finding a particular scorecard, PGSS™ allows you to sort your cards by entry order, by date, or by your score on individual holes, the front nine, the back nine, or the entire course. In addition, other menu items let you quickly find the following:

— The scorecards containing your high and low scores for the front nine, back nine, or entire course.

— The scorecards for the rounds in which you scored the most eagles, birdies, pars, bogeys, double bogeys, triple bogeys, or others.

— The scorecards for the rounds in which you scored the most consecutive eagles, birdies, pars, bogeys, double bogeys, triple bogeys, or others.

— The scorecards for the rounds in which you had the most holes over eagle, birdie, par, bogey, double bogey, or triple bogey.

— The scorecards for the rounds in which you had the most holes under birdie, par, bogey, double bogey, or triple bogey.

— The scorecards for the rounds in which you had the most consecutive holes over eagle, birdie, par, bogey, double bogey, or triple bogey.

— The scorecards for the rounds in which you had the most consecutive holes under birdie, par, bogey, double bogey, or triple bogey.

— The scorecards which match a particular pattern of scoring you select and enter.

PGSS™ will also allow you to print your scores, along with your distribution and scoring averages.

**• What are the system requirements of PGSS™?**

PGSS™ was written using THINK Pascal™ on a beige-colored Macintosh Plus with 4MB of RAM, using Systems 6.0.5 through 6.0.8. It is now running without incident on a cache-enabled Quadra 610 with 12MB of RAM, using System 7.5.1 in 32-bit mode. I am aware of no reason why it shouldn't operate on any intermediate configuration. If problems are experienced, however, please contact me and — if you are a registered owner — I will do my best to correct them. Aw, hell, I'll try and fix 'em even if you aren't registered.

There are two versions of PGSS™ available. The first — PGSS 68K™ — has been compiled into 68000 code. Hence, it can be used on any Macintosh™. The other version — PGSS 030™ — has been compiled into 68020/68030 code and, as a result, can only be used on Macintoshes with a 68020, 68030, or 68040 CPU. If your copy of the program has had the name changed, do a "Get Info" and check the version number. If you have PGSS 68K™, the version number will read "1.0 (68K)." If you have PGSS 030™, it will read "1.0 (030)." If you have one version and need the other, let me know.

Since PGSS™ needs at least 500K to operate, a Macintosh with more than 1MB of RAM will be needed. A hard drive is recommended, although not necessary.

**IMPORTANT NOTE:** PGSS™ is, as of this release, a monochrome (black-and-white) program. I have tried to spruce it up with color icons, but no amount of fiddling with your monitor or Control Panel will produce color. One sure way to turn PGSS™ into a vibrant, eye-pleasing, color experience, though, would be for about ten thousand — or, better yet, a *hundred* thousand — people to become registered owners at the low, low price of ten bucks a head.

• **What is the history (and future) of PGSS™?**

This is probably not a question you are asking, but one for which you will get an answer anyway. Two years and a couple of thousand man-hours ago, I got tired of trying to use spreadsheets to keep track of golf scores. Being an inveterate and impenitent hacker of both Macintoshes and little white balls, I thought there had to be a better way. And, from that tiny acorn sprung a mighty oak…

Even though what you see now is labeled as version 1.0, nothing could be further from the truth. Calling this program "1.0" is just a convenience to keep people from asking what the first seventy-four versions were like. PGSS™, like its creator, has just gotten better with age, and with a little help from the people who use it, it (and he) will continue to do so.

That was the wind-up. Here's the pitch. For the exceedingly reasonable sum of ten dollars ($10.00 US), you can become a registered owner of this program. In addition to the warm and fuzzy feeling you will get from the guilt-free possession and use of PGSS™,  I will keep your name and address on file and notify you of updates, bug fixes, and other relevancies, as they become available.

If you decide to keep and use PGSS™, please send your ten-spot (or a check or money order in that amount), along with your name, address, and telephone number to:

Jack Browning
210 McKnight Road
Fairview Heights, Illinois  61920

In return for your consideration and support, I will do my best to insure that your money is well-spent.
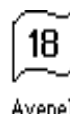
# CREATING A PGSS™ COURSE FILE

The basic component of PGSS™ is the course file. It contains the information about a course (the yardage and par of each of its holes) and, among other things, holds all of a player's scores for that course. For ambitious folks who would like to write programs that access the information contained in their PGSS™ course files, I have provided a Pascal **record** declaration for the files in the technical appendix.

PGSS™ lets you create separate course files for 9- and 18-hole courses. Each file can hold up to 500 scorecards. For an 18-hole course file, half of a round (i.e., playing only the front or back nine) counts as a single scorecard. PGSS™ course files look like this on the desktop:

Rolling Hills                                            Avenel

**9-Hole Course**          **18-Hole Course**

On color desktops, 9-hole icons are red with a light gray number and 18-hole icons are light gray with a red number.

To create a PGSS™ course file, select **Eighteen…** or **Nine…** from the **New** hierarchical menu item in the **File** menu and a new course dialog will appear. The 18-hole new course dialog looks like this:

Enter the par and yardage in the appropriate text edit boxes. When you are finished entering the information for a hole, press the "Next" button. This will add the hole's data to the par and yardage columns in the left portion of the new course dialog. To go backwards through the holes, hit the "Previous" button. To enter the data for a hole without moving to another one, press the "Enter" button. When you are done entering the course information, press the "OK" button. Pressing "Cancel" at any time will leave the new course dialog, and any data you've entered will be lost.

To edit information you've already entered for a hole, use the "Next" or "Previous" buttons to move to that hole, or click on the par or yardage cells for that hole in the columns on the left side of the dialog box. Clicking on a cell will transfer

the data for that hole to the text edit boxes and select the text in either the par or yardage edit box.

### *Features of the New Course Dialog*

Like every dialog in PGSS™ which has a title bar, the new course dialog can be dragged around the desktop. It is, however, a modal dialog. This means that you won't be able to select menu items or click in any other windows or the desktop until you dismiss the new course dialog. In that sense, it is not a "movable modal dialog" as defined by Apple. If you want to give it a name, call it a "mutant movable modal dialog" or "MMMD."

Also, like every dialog in PGSS™, all the buttons in the new course dialog have keyboard equivalents. Unlike the keyboard equivalents for menu items, you do not have to hold down the command key to use the button equivalents — you simply press the key you want. The button equivalents for the new course dialog are:

| Button | Equivalents |
|---|---|
| OK | "O" or "o" |
| Cancel | "C", "c", Return, or Esc |
| Next | "N", "n", or "+" (plus |
| Previous | "P", "p", or "-" (minus |
| Enter | "E", "e", or Enter |

In addition to using the Tab key to move between text edit fields in the new course dialog, you can also hit the period or decimal point ("." ) key.

Using the keyboard equivalents and your Macintosh™ keypad, entering course data becomes very quick and easy. The keying sequence for that operation works like this:

| *par* | Type in par |
|---|---|
| "." | Tab to yardage field |
| *yardage* | Type in yardage |
| "+" | Enter data and move to |

### *Note For Those Who Play On Courses With Par 6 Holes*

Par 6 holes are not supported by PGSS™. The only acceptable values for par are 3, 4, and 5. In addition, the yardage for a hole must fall between 1 and 999 yards. The management is sorry for any inconvenience this causes.

When you've completely entered your course information and checked it, press the "OK" button. If all the values you entered were acceptable, an empty PGSS™ window — like the one shown in the next section — will appear. It will be named

"Untitled • 1" (or "2" or "3", etc.).

At this point, you might want to check your course information one more time. If it's correct, select **Save** from the **File** menu and use the standard Macintosh™ file dialog box to save the course file under any name you choose. If you think you might be using the same course information for other course files, you may want to save your empty window as a template. You could then use the **Save As...** item from the **File** menu to save copies of the template as specific course files.

# THE PGSS™ COURSE WINDOW

A PGSS™ course window is where the basic information about a course and its scores is displayed. Every open course file will have its own window. You may have up to eight course file windows open at the same time.

For an 18-hole course, an empty course file window looks like this:

| # | YDG | P | SCR | -- | - | E | + | ++ | +++ | !!! | Mean | Lo | Hi | +/- |
|---|-----|---|-----|----|---|---|---|----|-----|-----|------|----|----|----|
| **0** | ----- | | | **DISTRIBUTION** | | | | | | | **AVERAGES** | | | **ENTRY** |
| 1 | 156 | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 | 452 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| 3 | 525 | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 | 395 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 | 286 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| 6 | 198 | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| 7 | 401 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 | 479 | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| 9 | 412 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| F | 3304 | 36 | - | - | - | - | - | - | - | - | - | - | - | - |
| 10 | 288 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| 11 | 595 | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| 12 | 201 | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| 13 | 385 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| 14 | 355 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| 15 | 499 | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| 16 | 152 | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| 17 | 410 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| 18 | 325 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| B | 3210 | 36 | - | - | - | - | - | - | - | - | - | - | - | - |
| T | 6514 | 72 | - | - | - | - | - | - | - | - | - | - | - | - |

The title bar, of course, tells you the name of the file associated with the window. It also contains the close and zoom boxes for the window.

Clicking in the close box of a PGSS™ window works as you might expect — it closes the window and its file.

Clicking in the zoom box, however, *iconizes* a PGSS™ window — converts it into a small iconic representation of the window. To expand an iconized window, just click in the zoom box again and the window grows to its original size. All of your data will be in exactly the same state as you left it.

Iconized windows can be selected and moved around the desktop by their title bars. While they are iconized, however, only PGSS™ file operations (saving, printing, etc.) can be performed on them. Iconized windows look like this:

**9-Hole Window**          **18-Hole Window**

Since the titles for iconized windows disappear when the windows are shrunk, if you need to identify or select a particular iconized window, use the window list appearing at the end of the **View** menu. Iconized windows will have a hollow diamond to the left of their name in that list.

The content region of a PGSS™ window is divided into four parts. The part farthest to the left is the **scorecard area**. This is where the course information and your scorecards are displayed. Directly above the column headings in the scorecard area, on the same level as the titles for the distribution and averages areas, are two boxes. The left box of this pair will display the number of the scorecard you are viewing — in the illustration above, since it's an empty PGSS™ window, that number is "0". The right box will show you the date of the scorecard currently being displayed.

Next to the scorecard area is the **distribution area**. This is where the distribution of your scores is displayed. The column headings for this area are as follows:

| Heading | Meaning |
|---------|---------|
| -- | Eagles and double eagles |
| - | Birdies |
| E | Pars |
| + | Bogeys |
| ++ | Double bogeys |
| +++ | Triple bogeys |
| !!! | Quadruple bogeys and above |

As you can see from the table, scores better than eagle are put in the eagle column, and scores worse than quadruple bogey are put in the quadruple bogey column. If you need to view the complete distribution of scores for a certain hole, you can, as we shall see later, obtain that information very easily.

To the right of the distribution area is the **averages area**. This is where scoring averages, low and high scores, and par differential are displayed. The column headings for this area are self-explanatory.

Finally, to the right of the averages area is the **button area**. This is literally where the action is in a PGSS™ window. When all of its buttons are enabled, the button area of a window looks like this:

The top button is the "New Card" button. As its name implies, you press it when you want to add a new card to your course file. Directly below the "New Card" button is the "Trash" button. You press it when you want to delete a card from your course file.

The two arrow buttons move you through your cards. You can use the up arrow to move forward and the down arrow to move backward. Every time you click in an arrow a new card is shown in the "SCR" column of the scorecard area, along with its number and date. In addition, the appropriate cells in the distribution area are highlighted to display the scoring distribution for that card. To browse through your cards, click and hold the mouse down on an arrow button. PGSS™ will continue to cycle through your cards until you release the mouse button.

To move directly to the first card in your course file, hold down the option key and click on the down arrow button. To move to the last card, hold down the option key while clicking on the up arrow button.

Any buttons that are grayed-out are inactive. Pressing on them will have no effect. The "New Card" button is active when a course file has less than 500 cards. The "Trash" button is active when there is at least one scorecard in a file. The arrow buttons are active when there are two or more scorecards in a file.

The window buttons also have keyboard equivalents. They are:

| Button | Equivalent |
|---|---|
| New Card | "N" or "n" |
| Trash | "T" or "t" |
| Up Arrow | "U", "u", "+" (plus), or up arrow |
| Down Arrow | "D", "d", "-" (minus), or down |

The keyboard equivalents will not work with disabled buttons. Holding down the key equivalent for an arrow button is the same as holding down the mouse button. Holding down the option key while typing an equivalent for an arrow button is the same as holding down the option key while clicking on an arrow button.

Just above the button area is a small box to remind you of the order in which your scorecards for that window are sorted. Since every open window in PGSS™ can have its cards sorted in a different order, if you get confused, just check the box. It will

display one the following labels:

| Label | Sort Order |
|---|---|
| ENTRY | By entry order |
| DATE | By date |
| FRONT | By front nine |
| BACK | By back nine |
| TOTAL | By total score |
| 1st, 2nd, | By Nth hole score |

# ADDING A CARD TO A PGSS™ COURSE FILE



After pressing the "New Card" button (or its keyboard equivalent) in a PGSS™ window, the new card dialog box will appear. For an 18-hole course, the new card dialog looks like this:



The new card dialog operates the same as the new course dialog with a few minor differences. The first is that you only enter one value — the score — per hole. By using the keypad and "+" equivalent for the "Next" button, entering scores is fast and easy. The key sequence for that operation is:

| | |
|---|---|
| *score* | Type in score |
| "+" | Enter data and move to |

That's all there is to it. In fact, with just a little practice, the scoring for an entire 18-hole round can be entered in less than twenty seconds.

The keen observer will notice two items in the new card dialog that were not in the new course dialog. The first of these is a box displaying the current date. This box is called the **date box**. PGSS™ assumes that the date for a new card will be the date the card is created. If that is not the case, click on the date box and a smallish dialog box will appear in the lower right-hand corner of the new card dialog. It looks like this:



By clicking on the plus or minus boxes to the right of the numbers, you can set the date to whatever you want. The numbers are ordered in a M/D/Y format — the date shown in the illustration, for example, is February 22nd, 1994. When you have set the appropriate date, press the "OK" button — or type "O" or "o". If you have entered a valid date, the date dialog will disappear and the date you entered will take its place in

the date box of the new card dialog.

PGSS™ checks the date to make sure that the month and day correspond. If the month is February, it will adjust the number of days for leap years. It will also check to see if the date falls within the range that PGSS™ supports: January 1, 1941 to February 6, 2040. If you attempt to enter an invalid date, PGSS™ will beep and the date dialog will not disappear. You can change the date and try again or press "Cancel" — or type "C", "c", Enter, Return, or Esc — to leave the date dialog. "Cancel" will return you to the new card dialog without making any changes to the card's date.

Sorry, there are no keyboard equivalents for the date-setting controls. Management apologizes for any inconvenience this may cause.

The second unique item in the new card dialog is called the **half-round selector**. It looks like this:



You use the half-round selector to tell PGSS™ that you only played the front or back nine of an 18-hole course. By default, the new card dialog box for an 18-hole course sets the selector (as in the illustration above) for a complete 18-hole round. To change that, simply click in the appropriate selector box. Clicking on the first box tells PGSS™ you only played the front nine. Clicking on the second tells it you only played the back nine. In each instance, PGSS™ only allows you to enter scores for holes on the nine you chose. You can change nines or go back to eighteen holes at any time, but if you deselect a nine in which you have already entered scores, those scores will be cleared.

When you've finished entering the scores for a round, press the "OK" button. If the scores you have entered are valid, the new card dialog will disappear and your course file's window will be updated to reflect the new card. PGSS™ will only allow you to enter a score between 1 and 25 for any hole. Any holes zeroed by the half-round selector are taken care of automatically by PGSS™. Hitting "Cancel" at any time will leave the new card dialog. No changes will be made to the course file and and any scores you entered will be lost.

To edit a score you've already entered, use "Next" or "Previous" to move to that hole, or click on the score's cell in the columns on the left side of the dialog box. Clicking on a cell will move the score in that cell to the text edit box and select it for editing.

### *Features of the New Card Dialog*

Like its cousin, the new course dialog, the new card dialog is an MMMD. It can be moved around the desktop by its title bar, but no mouse clicks will register in the menu bar, desktop, or other windows until it has been dismissed.

The button equivalents for the new card dialog are:

| Button | Equivalents |
| --- | --- |

| OK | "O" or "o" |
|---|---|
| Cancel | "C", "c", Return, or |
| Next | "N", "n", or "+" |
| Previous | "P", "p", or "-" |
| Enter | "E", "e", or Enter |

The date box and half-round selector can also be controlled from the keyboard. The equivalents for these items are:

| Item | Equivalents |
|---|---|
| Date box | "D" or "d" |
| Half-round selector (front 9) | "F" or "f" |
| Half-round selector (back 9) | "B" or "b" |
| Half-round selector (18) | "A" or "a" |

After you press the "OK" button and PGSS™ validates your scores, it goes to work updating your course file to reflect the new information. It adds the new scorecard to your score distribution, recalculates your scoring averages and par differentials, and alters your low and high scores as needed. If your cards are sorted in some order other than the order in which they were entered, PGSS™ also re-sorts your course file. On my hoary old Mac Plus, this process (and others) took a small but noticeable amount of time. To give the user some visual feedback, I made the cursor change to reflect the operations that were taking place. In all probability you will never see these cursors, but, in case you do, here's what they look like and mean:

PGSS™ is *calculating…*

PGSS™ is *sorting…*

PGSS™ is *throwing a card away…*

PGSS™ is *compiling a distribution…*

PGSS™ is *finding something…*

PGSS™ is *printing…*

In any event, after PGSS™ finishes its behind-the-scenes update of your course file, it will display the results visually in your course file's window. An 18-hole course file window looks like this after a couple of scorecards have been entered:

| # | YDG | P | SCR | -- | - | E | + | ++ | +++ | !!! | Mean | Lo | Hi | +/- |
|---|-----|---|-----|----|----|---|---|----|-----|-----|------|----|----|-----|
| 1 | 156 | 3 | 5 | - | - | - | - | 2 | - | - | 5.00 | 5 | 5 | 2.00 |
| 2 | 452 | 4 | 7 | - | - | - | - | 1 | 1 | - | 6.50 | 6 | 7 | 2.50 |
| 3 | 525 | 5 | 4 | - | 1 | 1 | - | - | - | - | 4.50 | 4 | 5 | -0.50 |
| 4 | 395 | 4 | 6 | - | - | - | 1 | 1 | - | - | 5.50 | 5 | 6 | 1.50 |
| 5 | 286 | 4 | 5 | - | - | - | 2 | - | - | - | 5.00 | 5 | 5 | 1.00 |
| 6 | 198 | 3 | 3 | - | - | 1 | - | - | - | 1 | 5.00 | 3 | 7 | 2.00 |
| 7 | 401 | 4 | 4 | - | - | 2 | - | - | - | - | 4.00 | 4 | 4 | 0.00 |
| 8 | 479 | 5 | 4 | - | 1 | - | 1 | - | - | - | 5.00 | 4 | 6 | 0.00 |
| 9 | 412 | 4 | 5 | - | - | 1 | 1 | - | - | - | 4.50 | 4 | 5 | 0.50 |
| F | 3304 | 36 | 43 | - | 2 | 5 | 5 | 4 | 1 | 1 | 45.00 | 43 | 47 | 9.00 |
| 10 | 288 | 4 | 5 | - | - | 1 | 1 | - | - | - | 4.50 | 4 | 5 | 0.50 |
| 11 | 595 | 5 | 7 | - | - | - | - | 2 | - | - | 7.00 | 7 | 7 | 2.00 |
| 12 | 201 | 3 | 3 | - | - | 1 | 1 | - | - | - | 3.50 | 3 | 4 | 0.50 |
| 13 | 385 | 4 | 5 | - | - | - | 1 | - | 1 | - | 6.00 | 5 | 7 | 2.00 |
| 14 | 355 | 4 | 5 | - | - | - | 1 | - | 1 | - | 6.00 | 5 | 7 | 2.00 |
| 15 | 499 | 5 | 7 | - | - | 1 | - | 1 | - | - | 6.00 | 5 | 7 | 1.00 |
| 16 | 152 | 3 | 3 | - | - | 1 | 1 | - | - | - | 3.50 | 3 | 4 | 0.50 |
| 17 | 410 | 4 | 5 | - | - | 1 | 1 | - | - | - | 4.50 | 4 | 5 | 0.50 |
| 18 | 325 | 4 | 5 | - | - | - | 1 | 1 | - | - | 5.50 | 5 | 6 | 1.50 |
| B | 3210 | 36 | 45 | - | - | 5 | 7 | 4 | 2 | - | 46.50 | 45 | 48 | 10.50 |
| T | 6514 | 72 | 88 | - | 2 | 10 | 12 | 8 | 3 | 1 | 91.50 | 88 | 95 | 19.50 |

Notice how the cells in the distribution area are highlighted to reflect the distribution of the scorecard currently being displayed.

You should also note that PGSS™ — after leaving the new card dialog — will always show you the scorecard you just entered. This may be a trifle confusing if you have entered a card which, because of its date or one of its scores, gets sorted into the middle of a course file. Just remember that the number shown next to a scorecard's date in the course file only represents the relative position of that card in the course file, as the file is currently sorted. That number can, and probably will, change whenever you sort your course file by a different item.

After your course file's window has been updated, it's usually a pretty good time to go back and check the scores you entered again. If they're up to snuff, select the **Save** item from the **File** menu and save the changes you've made to your course file.

If, on the other hand, you made a mistake entering your scores for a round, hit the Trash button and throw away the error-stricken card. You can then enter the correct scores on a new card.

All of which brings us around to one of PGSS™'s dirty little secrets: by design, it does not support hole-by-hole editing of existing scorecards. Some of the earlier versions of PGSS™ did have this capability. What I discovered, however, was that hole-by-hole editing made it just too easy to revise one's golfing history ("Did I *really* take a six on that hole? I'm almost positive it was only a five."), either consciously or

unconsciously. So, in order to preserve the integrity of the game (and your course files), I made it a tad bit harder to go back and change a score that's already been entered. It shouldn't be any great burden, really, since PGSS™ gives you ample opportunity to check your scorecards before you enter and save them.

# DELETING A CARD FROM A PGSS™ COURSE FILE

Deleting a card from a course file is simple, quick, and easy. PGSS™ does all the heavy lifting.

To delete a card, navigate through your course file using the arrow buttons until the card you want to delete is displayed. Once it is, press the Trash button in your course file's window. PGSS™ will then present an alert box that looks something like this:
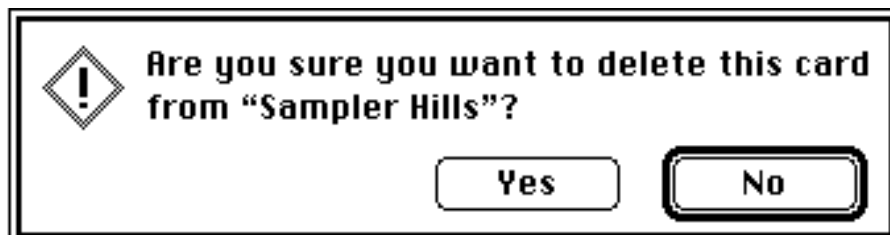


If you want the card deleted, press the "Yes" button in the alert box — or type "Y" or "y" — and PGSS™ will delete the card from the course file, updating the course file (and its window) to reflect the deletion. Again, you might see the cursor change while the behind-the-scenes machinations are going on.

If you don't want the card deleted, just click on "No" — or type "N", "n", Return, or Enter. The alert box will disappear and no changes will be made to the file.

# HOW PGSS™ MAINTAINS A COURSE FILE
# (AN ITEM OF REVERSIONARY INTEREST)

When a course file is opened by PGSS™, all the information contained in that file is loaded into your computer's memory. Any changes you make to a file (adding cards, deleting cards, changing the sort order, etc.) are not saved to disk until you tell PGSS™ to save the file. In other words, PGSS™ does *not* automatically save the changes to a course file.

PGSS™ will, however, ask if you want to save a changed course file before it closes the window for that file. It will also ask you if you want to save any changed course files before it quits.

If you have changed a course file but have not yet saved that file to disk, you can go back to the last saved version of the file by selecting **Revert…** from the **File** menu. If you select the **Revert…** item, PGSS™ will display an alert box that looks like this:

Are you sure you want to go back to the last saved version of "Sampler Hills"?

Yes    No
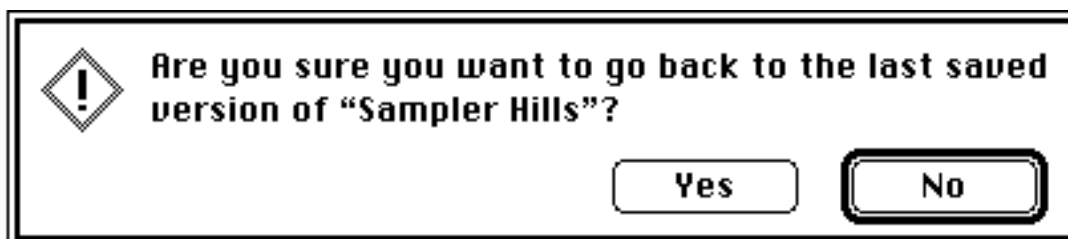
Pressing the "Yes" button for this alert — or typing "Y" or "y" — will the load the contents of the last saved version of the course file into your computer's memory. That will replace the course file already in memory. Any changes you made to the file being replaced will be lost.

If you don't want to replace the course file currently in memory, click on the "No" button when this alert appears — or type "N", "n", Return, or Enter.

Another implication of the way in which PGSS™ maintains course files is that if you should lose power to your computer or suffer an unrecoverable error while using the program, any changes you made to files which have not been saved will be lost when you return to the program. The moral to that story is, however, a familiar one: save early, and save often.

# ORGANIZING CARDS IN A PGSS™ COURSE FILE



PGSS™ lets you to organize your course file by entry order, by date, by front nine score, by back nine score, by total score, or by your scores on a certain hole. You can change the organization of your course file by choosing the order you desire from the **Sort** menu. The complete **Sort** menu for PGSS™ looks like this:
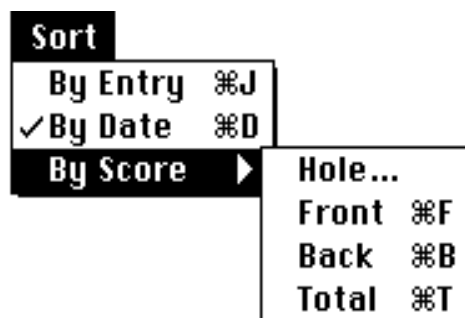


The order in which your course file is currently sorted will be shown in the **Sort** menu by a check mark to the left of the appropriate item. In the illustration, the course file is currently sorted by date.

If you select the **Hole…** item from the **By Score** menu, a dialog box will appear asking you to enter the hole by which you want the course file sorted. The dialog box looks likes this:
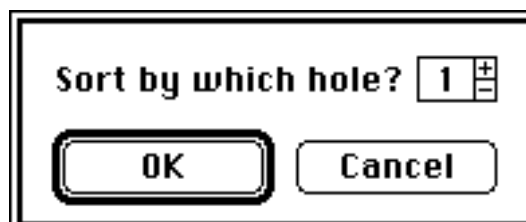


You can select the hole by which you want to sort by clicking in the plus or minus boxes to the right of the hole number. When you have selected the hole, click on the "OK" button or type "O", "o", Enter, or Return. To go back to your course file window without sorting, hit the "Cancel" button or type "C", "c", or Esc.

The **Sort** menu will only be active when there is something for PGSS™ to sort, i.e., when you have more than one card in a course file. PGSS™ will sort your course file in ascending order — which means the earliest dates or the lowest scores will be at the beginning of the file. If you are sorting your cards by date and PGSS™ encounters two or more cards with the same date, it will sort those cards by entry order. If you are sorting your cards by score and PGSS™ encounters two or more cards with the same score, it will sort those cards by date. If two or more cards have the same score *and* the same date, PGSS™ will sort those cards by the order in which they were entered.

The sort routines for PGSS™ are written in 68000 assembly language and, as a result, are very fast. So fast, in fact, that you should not hesitate to use them to help you in finding a particular card you're looking for. For example, if you've played fifty

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rounds at a particular course and birdied a certain hole just once, you could sort your course file by that hole, option-click on the up arrow to move to the first card in the file, and immediately find the card containing the birdie.

In addition to the command-key shortcuts for items in the **Sort** menu, PGSS™ allows you to sort a file by front nine score, back nine score, total score, or your score on a particular hole without using the **Sort** menu. To do this, just hold down the command key and click on one of the boxes in the "#" column in the scorecard area of your course file's window. For example, if you wanted to sort your course file by your scores on the twelfth hole, you would hold down the command key and click on the box labeled "12". Similarly, if you wanted to sort your file by your scores on the front nine, you would hold down the command key and click on the box labeled "F".

PGSS™ keeps track of which card you were looking at when you sorted your course file. When it finishes sorting your file, you will still be viewing the same card. The card's number may have changed, but, as explained earlier, a card's number just tells you what its relative position is in the file, as the file is currently sorted.

Normally, I keep my course files sorted by date. That way, when I add a new card, it's placed at the end of my file. To find out quickly how the scores on the new card match up to my other scores, I sort the file by front, back, and then total score. Since PGSS™ continues to display the new card I just entered, all I do is look at the changing number of the new card to get a good idea of how the its scores compare with the scores of my other cards.

# FINDING CARDS IN A PGSS™ COURSE FILE



### *Getting Home*

When you save a course file, PGSS™ saves both the sort order of the file *and* the card which was being displayed. That way, when you reopen a saved file, you will see exactly what you saw when you last saved the file. When it opens a file, PGSS™ keeps track of the file's **home position**. This is just the file's sort order and the card it displayed at the time it was opened. As long as you have not added or removed cards from a file, you can return to a file's home position at any time by choosing the **Home** item under the **Find** menu. To change a file's home position (or set a new one), simply sort the file the way you want it, navigate to the card you want displayed, and save the file. That sort order and card will become the file's new home position.

Since PGSS™ considers a change in sort order or the card being displayed to be a change in a course file, it will ask if you want to save those changes when you attempt to close a file's window or quit the program.

### *The Index*

An index of the cards in a course file is available for any file which has been sorted by date or score. This index can be obtained by choosing the **Index** item under the **View** menu. When that item is selected, a dialog box looking like this will be displayed:



The dialog box illustrated represents the index for a file which has been sorted by date. If you request an index for a file sorted by score, you will see scores listed instead of dates.

The index dialog is an MMMD. It can be moved around by its title bar to give you a clear view of your course file window. To dismiss the index dialog, you can either click in its close box or type Escape, Return or Enter.

To have your course file window display a card shown in the index, just click in the date (or score) column on the card you want to see. You can also use the keyboard

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to select an index item. Simply type the number between 0 and 9 which corresponds to the card you want to see. This works identically to clicking on that item with the mouse. After you click on a list item (or type in its number) you will see your course file window display the card you selected.

The "#" column to the right of the date (or score) column tells you how many cards are in the course file under that index heading. PGSS™ will always take you to the first card in a group if more than one card exists for a particular index heading.

If your index has more than ten headings (like the one shown above), the scroll bar for the index dialog will be active. It operates the same as any Macintosh™ scroll bar, with the exception that you will be paged through your index list ten items at a time. Scrolling to individual items is not supported by the index dialog. Clicking in the up or down arrows of the scroll bar, therefore, is just like clicking in its page-up or page-down regions, i.e., you will move through the list ten items at a time.

While the index dialog is active, you can use the up arrow and down arrow keys on your keyboard to control the scroll bar.

When you've chosen the card or group of cards you want, dismiss the index dialog and you will have full access to the menu bar and the buttons in your course file's window.
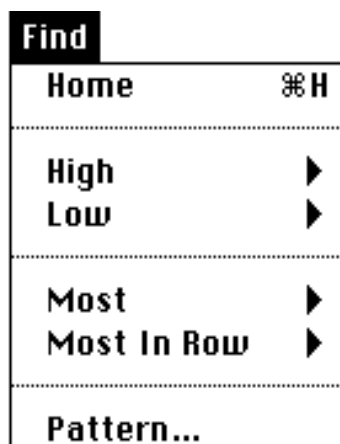
### *Tell Me More…*

In addition to finding cards with the index, you can also find cards in a course file that meet specific criteria. By choosing the appropriate item under the **Find** menu, you can find and display:

— The cards which contain your high or low scores for the front nine, back nine, or entire course.

— The cards for the rounds in which you scored the most eagles, birdies, pars, bogeys, double bogeys, triple bogeys, or others.

— The cards for the rounds in which you scored the most consecutive eagles, birdies, pars, bogeys, double bogeys, triple bogeys, or others.

— The cards for the rounds in which you had the most holes over eagle, birdie, par, bogey, double bogey, or triple bogey.

— The cards for the rounds in which you had the most consecutive holes over eagle, birdie, par, bogey, double bogey, or triple bogey.

— The cards for the rounds in which you had the most holes under birdie, par, bogey, double bogey, triple bogey, or other.
— The cards for the rounds in which you had the most consecutive holes under birdie, par, bogey, double bogey, triple bogey, or other.

— The cards which meet a certain pattern of scoring you select.

### *The Find Menu*

This is the **Find** menu:

```
┌──────────────────────────┐
│ Find                     │
├──────────────────────────┤
│  Home            ⌘H      │
│ ┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈ │
│  High              ▶     │
│  Low               ▶     │
│ ┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈ │
│  Most              ▶     │
│  Most In Row       ▶     │
│ ┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈ │
│  Pattern...              │
└──────────────────────────┘
```

As you can see, the items in this menu correspond to the descriptions given above. Four of the six items in the menu are hierarchical. This means that if you choose one those items, another menu will appear for you to select from. With that in mind, let's examine the items in the **View** menu.

### *Finding High and Low Scores*

The **High** and **Low** menu items allow you to find your high and low scores. When you choose one of these items, another menu will appear to the right of the selected item. It looks like this:

```
┌──────────┐
│ Front    │
│ Back     │
│ Total    │
└──────────┘
```

By choosing the item you want from this combination of menus, you can find your high or low scores from the front nine, back nine, or entire course. To find your low score on the front nine of a given course, you would choose the **Low**-**Front** menu combination. Likewise, to find your high score for eighteen holes you would select **High** and **Total**. If you're working with a 9-hole course, or an 18-hole course that doesn't yet have any scores for the front or back nines, any irrelevant items will be disabled in the hierarchical menu.

When you are using any of the hierarchical menus in PGSS™, it may be helpful to think of yourself as constructing a sentence out of menu items. The titles I used for items have been chosen in such a way that if you follow the chain of items across the screen, you will know exactly what you are doing.

### *Finding Streaks and Strings and Such*

The same concept applies to the **Most** and **Most In Row** menu items. They are slightly more complicated, however, because the hierarchical menu which appears when you choose them, in turn, contains other hierarchical menu items. When you select **Most** or **Most In Row**, the following menu appears to the right of the selected item:

```
Over        ▶
Under       ▶
...................
Eagles
Birdies
Pars
Bogeys
Doubles
Triples
!!!s
```

Again, you would use a combination of menu items to find the cards you wanted. For example, if you wanted to see the card where you scored the most birdies, you would use the **Most-Birdies** combination. Likewise, if you wanted to view the card where you scored the most pars in a row, you would select **Most In Row** and **Pars**. It's really quite easy.

The two hierarchical items in this menu let you find the most or most consecutive scores over or under a particular score. When you select the **Over** or **Under** item, one of the menus below will appear to its right:

```
Eagle
Birdie
Par
Bogey
Double
Triple
```
**Over Menu**
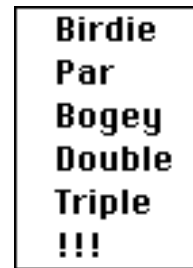
```
Birdie
Par
Bogey
Double
Triple
!!!
```
**Under Menu**

Continuing with the sentence analogy, if you want to find a card which contains the most holes under par, you would use the **Most-Under-Par** menu combination. Likewise, if you wanted to look at the card which contained the most consecutive holes over par, you would select **Most In Row-Over-Par**. Since a picture is worth a thousand words, this is what the **Most In Row-Over-Par** menu combination would look like on your desktop:
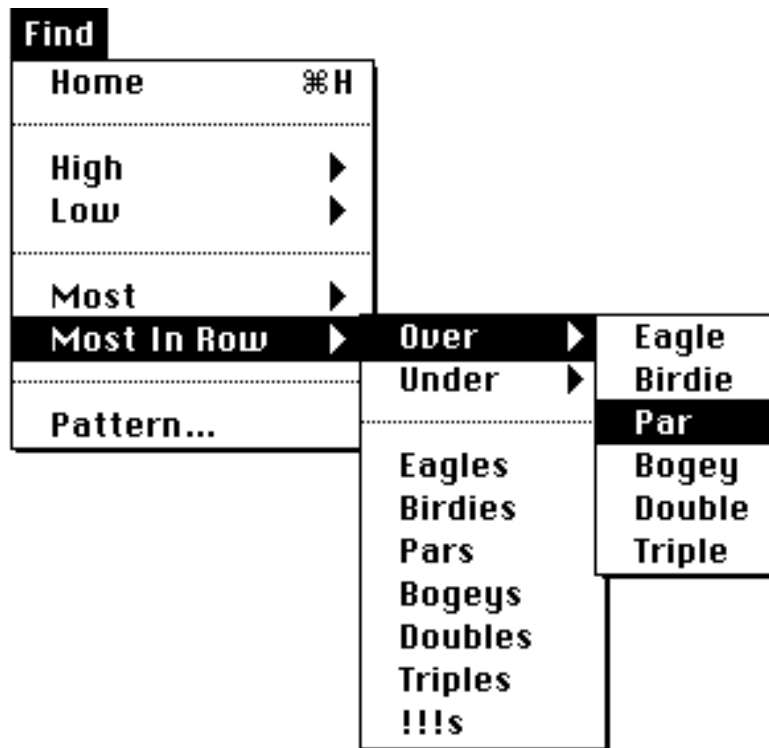
As daunting as this may seem, using the hierarchical menus becomes second nature with just a little practice. Even though this really is the easiest way to do this operation, I'm sure my use of multiple hierarchical menus will earn me a spot on the Ten Most Wanted list of Apple's interface police.
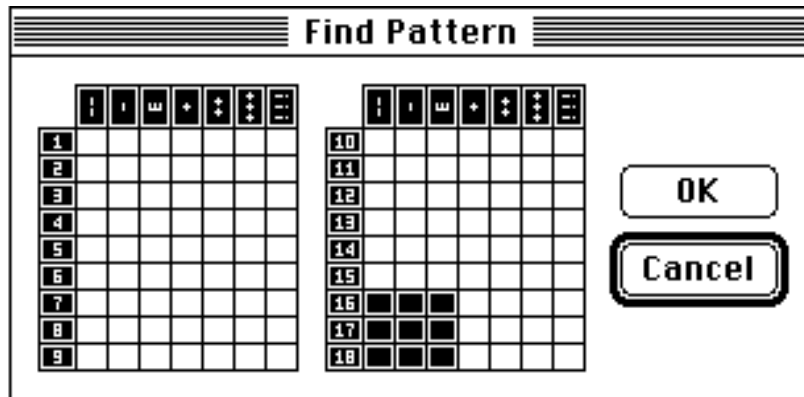
### Finding a Pattern

The final item in the **Find** menu is the **Pattern…** item. As its name implies, it lets you find cards in which a particular pattern of scoring exists. When you select this item, the pattern dialog box appears. For an 18-hole course, it looks like this:
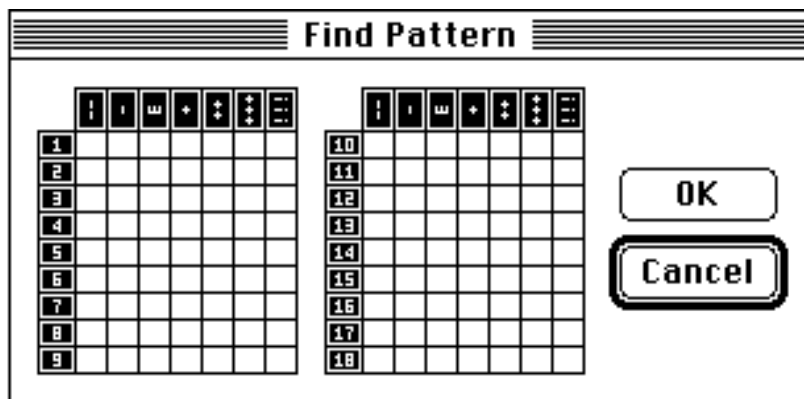


As you can see, the pattern dialog contains a distribution grid. You select the items in the pattern you want to find by clicking on individual cells in this grid. You can turn off any cell selection you have made by clicking on the selected cell. When you have finished entering the pattern, press the "OK" button — or type "O" or "o" — and PGSS™ will set off in search of that pattern. To cancel the pattern dialog without finding anything, just hit the "Cancel" button or type "C", "c", Return, Enter, or Esc.

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PGSS™ will find only those cards which *exactly* match the pattern you select. It ignores the scores of holes in which no cells are selected. For example, if you wanted to find all of the cards in a course file in which you played 16, 17, and 18 with scores of par or better, your pattern dialog would like this:



You can select as many cells for as many holes as you want. Of course, selecting every cell in the grid would just find every card in your course file.

To simplify the process of entering a pattern, a couple of shortcuts are available. To select all of the valid cells for a certain hole, just click on the number for that hole. To select all the holes that contain a certain score, just click on that score's column heading. You can then narrow your search by turning off some of the cells PGSS™ has highlighted.

### Tell Me Even More…

If PGSS™ can't find any cards which meet the criteria you specified, it will tell you so by beeping and displaying the following alert:
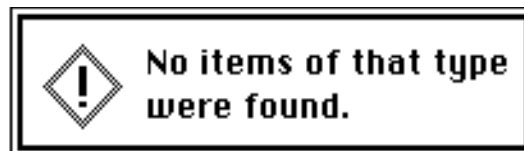


This alert is another of the monstrous creations from my lab. It is called an **instant alert**. You will notice that it has no buttons or close box. That's because all you need to do to dismiss an instant alert is click the mouse or press any key. It will remain displayed until you take one of those actions. Even though it really is a waste of time and effort to click on a specific button or hit a specific key to dismiss an alert, this stunt, I'm sure, will move me up to the third or fourth spot on the Ten Most Wanted list.

If PGSS™ finds just one card that meets your criteria, it will display that card in your course file window.

If PGSS™ finds more than one card, it will display the find dialog box, which

looks like this:
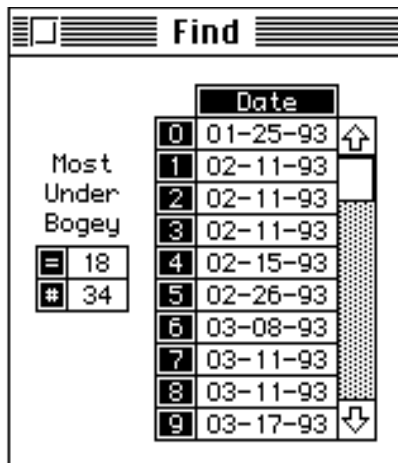


The find dialog contains a list of all the cards which meet the criteria specified. The illustration shows the first page of a list of cards in which the most holes under bogey were scored. This particular list is taken from a file of my scores on the TPC of Avenel course in *PGA Tour Golf*. The label and numbers to the left of the card list say that I have scored 18 holes under bogey, (i.e., shot a bogey-free round) on 34 occasions. The card list displays the dates of the cards in which I shot those rounds. The label and numbers will, of course, change according to the criteria you specify. If you have found cards using a pattern, then no label will be displayed and the word 'PAT' (instead of a number) will appear in the "=" box of the find dialog.

The fact that this dialog looks a lot like the index dialog is no accident. They both work in exactly the same way. The find dialog is an MMMD, meaning you can move it to wherever you want on the desktop. To have one of the cards in the list displayed in your course file window, simply click on the date of the card (or type the number to the left of the card's date).

If the list of found cards contains more than ten items (as does the list above), the scroll bar for the find dialog will be active. It works in exactly the same way as the scroll bar for the index dialog, i.e., it scrolls through the list ten items at a time. You can also use the up and down arrow keys on your keyboard to control the scroll bar in the find dialog.

When you are finished working with the find dialog, you can dismiss it by clicking in its close box or by typing Return, Enter, or Esc. You will then have access to the menu bar and the buttons in your course file's window.

The last menu left to explore in PGSS™ is the **View** menu. When it is selected from the menu bar, it will look something like this:

```
┌──────────────────────────┐
│ View                     │
├──────────────────────────┤
│  Index            ⌘I     │
│ ........................ │
│  Summary          ▶      │
│  Distribution     ▶      │
│  Rankings         ▶      │
│ ........................ │
│  Last...          ⌘L     │
│ ........................ │
│  Avenel                  │
│ ◇ PGA West               │
└──────────────────────────┘
```
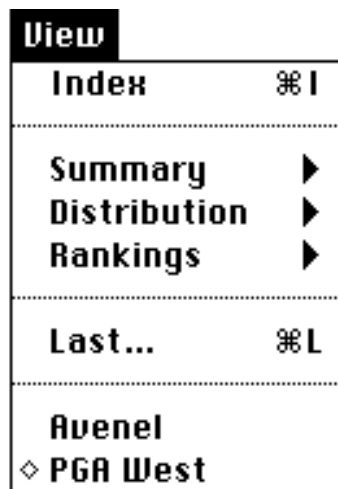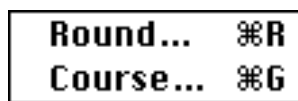
*Viewing a Round Summary*

Since the **Index** item has already been discussed, we will start with the **Summary** item. This item is hierarchical, i.e., selecting it will display another menu for you to choose from. When you select **Summary**, the following menu will appear directly to its right:

```
┌─────────────────────┐
│ Round...      ⌘R    │
│ Course...     ⌘G    │
└─────────────────────┘
```

By selecting an item from this menu, you will be able to view either a summary of the card (round) currently being displayed in the course file window or a summary of your scoring based on all the cards in your course file.

Choosing the **Round…** item will cause a round summary dialog to appear. For an 18-hole card, the round summary dialog looks like this:

| Round Summary | -- | - | E | + | ++ | +++ | !!! | +/- |
|---|---|---|---|---|---|---|---|---|
| 3 | – | 1 | 2 | – | 1 | – | – | +1 |
| 4 | – | 4 | 3 | 3 | – | – | – | –1 |
| 5 | 1 | 3 | – | – | – | – | – | –5 |
| T | 1 | 8 | 5 | 3 | 1 | – | – | –5 |
| F | 1 | 4 | 3 | 1 | – | – | – | –5 |
| B | – | 4 | 2 | 2 | 1 | – | – | E |

The round summary dialog displays information about the card showing in your course file window, summarizing that round in terms of how you scored on par

3s, par 4s, and par 5s, the front and back nines, and the entire course. In the example above, a birdie, two pars, and a double bogey were scored on the par 3s, and those holes were played one over par (+1). On the par 5 holes, an eagle and three birdies were scored, with those holes being played a total of five under par (-5).

The round summary dialog has no buttons or close box, but it does have a title bar. That makes it an *instant* MMMD. This means the round summary dialog can be moved by its title bar anywhere on the desktop. To dismiss it, just click anywhere outside its title bar or press any key. It will remain visible until your perform one of those actions.

### *Viewing a Course Summary*

Choosing the **Course...** item will cause a course summary dialog to appear. The course summary dialog looks like this:

### Course Summary

| COUNT | -- | – | E | + | ++ | +++ | !!! | +/- |
|---|---|---|---|---|---|---|---|---|
| 3 | 1 | 196 | 483 | 82 | 60 | 10 | 16 | 0.14 |
| 4 | 13 | 613 | 1227 | 211 | 45 | 8 | 3 | -0.14 |
| 5 | 42 | 489 | 260 | 47 | 7 | 3 | – | -0.59 |

| PERCENTAGE | -- | – | E | + | ++ | +++ | !!! |
|---|---|---|---|---|---|---|---|
| 3 | 0.1 | 23.1 | 57.0 | 9.7 | 7.1 | 1.2 | 1.9 |
| 4 | 0.6 | 28.9 | 57.9 | 10.0 | 2.1 | 0.4 | 0.1 |
| 5 | 5.0 | 57.7 | 30.7 | 5.5 | 0.8 | 0.4 | 0.0 |
| T | 1.5 | 34.0 | 51.6 | 8.9 | 2.9 | 0.6 | 0.5 |

As its name implies, the course summary dialog summarizes your scoring based on *all* the cards in your course file. It does this by count and by percentage. The count portion of the course summary dialog displays the distribution of your scores on the par 3s, par 4s, and par 5s of a course. It also calculates and displays your par differential for those holes.

The percentage part of the course summary dialog shows your scoring percentages for par 3s, par 4s, par 5s, and the entire course. In the illustration, eagles are scored 5.0% of the time on par 5 holes and 1.5% of the time for the course overall. Pars are scored 57% of the time on par 3 holes and 51.6% of the time for the course overall. The percentages for a category may add up to slightly more or less than 100% due to rounding error.

The course summary dialog, like the round summary dialog, is an instant MMMD — it can be moved around the desktop by its title bar and dismissed by clicking anywhere outside the title bar or pressing any key.

The next item under the **View** menu is entitled **Distribution**. It is a hierarchical item, which means it will present another menu when it is selected. When you choose the **Distribution** item, the following menu will appear to its right:

```
Hole...  ⌘1
Front    ⌘2
Back     ⌘3
Total    ⌘4
```

By selecting an item from this menu, you can obtain a distribution of your scores for a particular hole, for the front or back nines, or for the entire course.

Choosing **Hole...** from this menu will bring up a dialog box asking you to select the hole for which you want the distribution. The hole selection dialog looks like this:

```
Distribution of which hole?  1 ⊞

      OK            Cancel
```

You can choose the hole by clicking in the plus or minus boxes to the right of its number. When the hole you want is displayed, click the "OK" button — or press "O", "o", Return, or Enter. If you change your mind about viewing a distribution of your scores, just hit the "Cancel" button — or press "C", "c", or Esc.

Selecting **Front**, **Back**, or **Total** from the **Distribution** menu will give you the appropriate distribution of scores immediately. After you have chosen the distribution you want, PGSS™ will show it to you in a distribution dialog box, which looks like this:

| Distribution | | | |
|---|---|---|---|
| T | # | Cum | Date |
| 59 | 2 | 2 | 09-20-93 |
| 61 | 3 | 5 | 08-30-93 |
| 62 | 3 | 8 | 09-20-93 |
| 63 | 11 | 19 | 02-11-94 |
| 64 | 14 | 33 | 02-11-94 |
| 65 | 11 | 44 | 01-12-94 |
| 66 | 18 | 62 | 02-22-94 |
| 67 | 28 | 90 | 02-22-94 |
| 68 | 20 | 110 | 02-11-94 |
| 69 | 24 | 134 | 02-22-94 |

As you can see, there are four columns of information in a distribution dialog.

The first column — which will have "F", "B", "T", or a hole number as its heading, depending on the kind of distribution you chose — shows the scores that make up the distribution.

The next three columns display the following information:

| Column | Information Displayed |
|---|---|
| "#" | The number of times a score has been shot |
| "Cum" | The number of times that score *or lower* has |
| "Date" | The date on which that score was last shot |

In the illustration above, for example, a score of 66 was shot 18 times, a score of 66 or lower was shot 62 times, and that score was last shot on February 22nd, 1994.

The distribution dialog is an MMMD — it can be moved around the desktop by its title bar, but no mouse clicks will register in the menu bar, windows, or desktop. You can dismiss the distribution dialog by clicking in its close box or typing Return, Enter, or Esc.

If the distribution contains more than ten items (as does the one above), the scroll bar for the distribution dialog will be active. It works in exactly the same way as the scroll bar for the index and find dialogs, i.e., it scrolls through the distribution ten items at a time. You can use the up and down arrow keys on your keyboard to control the scroll bar.

You should note that when you ask for a distribution of your scores on a particular hole, PGSS™ will, unlike the distribution area of your course file window, display the distribution of *all* of your scores for that hole. In other words, any double eagles or scores over quadruple bogey will be separately compiled and displayed.

PGSS™ allows you to obtain a distribution of your scores without selecting an item from the **Distribution** menu. To do this, just hold down the option key and click on one of the boxes in the "#" column of the PGSS area of your course file window. For example, if you wanted a distribution of your scores for the twelfth hole, you would hold down the option key and click on the box labeled "12". Similarly, if you wanted to look at the distribution of your scores for the front nine, you would hold down the option key and press on the box labeled "F".

### *Viewing Hole Rankings*

The next item in the **View** menu is entitled **Rankings**. Being a hierarchical menu item, it will present another menu when it is selected. When you select the **Rankings** item, the following menu will appear to its right:

```
+/-              ⌘=
Percentage    ▶
```

Selecting the first item in the **Rankings** menu, **+/-**, will display a list of the holes for the course, sorted by the amount over or under par you played them. This list is ordered from easiest to hardest. In other words, the holes on which you shot best in comparison to par will be put at the top of the list and your worst holes will be put at the bottom.

For an 18-hole course, the differential dialog looks like this:

### Ranking

| | # | YDG | P | +/- |
|---|---|---|---|---|
| 1 | 5 | 533 | 5 | -0.66 |
| 2 | 16 | 571 | 5 | -0.64 |
| 3 | 8 | 557 | 5 | -0.60 |
| 4 | 11 | 618 | 5 | -0.47 |
| 5 | 12 | 360 | 4 | -0.39 |
| 6 | 14 | 390 | 4 | -0.34 |
| 7 | 7 | 350 | 4 | -0.27 |
| 8 | 2 | 373 | 4 | -0.26 |
| 9 | 4 | 184 | 3 | -0.25 |
| 10 | 9 | 450 | 4 | -0.07 |
| 11 | 1 | 440 | 4 | -0.06 |
| 12 | 3 | 470 | 4 | -0.04 |
| 12 | 15 | 470 | 4 | -0.04 |
| 14 | 10 | 414 | 4 | 0.00 |
| 15 | 18 | 440 | 4 | 0.06 |
| 16 | 13 | 220 | 3 | 0.19 |
| 17 | 6 | 255 | 3 | 0.26 |
| 18 | 17 | 166 | 3 | 0.34 |

The column of numbers displayed along the left side of the differential dialog show the rankings of the holes. In the example above, taken from a file of my scores on the PGA West course in *PGA Tour Golf*, you will notice that two holes, the 3rd and the 15th, have tied for twelfth in the ranking.

The differential dialog is an instant MMMD. This means that it can be moved by its title bar and dismissed by clicking anywhere outside the title bar or pressing any key.

The next item in the **Rankings** menu is **Percentage**. It's a hierarchical menu item and selecting it will cause the following the menu to appear to its right:

```
Eagle
Birdie
Par
Bogey
Double
Triple
!!!
```

By selecting an item from this menu, you will be able to obtain a sorted ranking

of the holes of a course in terms of the percentage of times you have obtained a particular kind of score (or better) on them.

For an 18-hole course, the percentage ranking dialog looks like this:

**Ranking**

| Rank | # | YDG | P | COUNT < | COUNT E | COUNT > | PERCENTAGE < | PERCENTAGE E | PERCENTAGE > |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 16 | 571 | 5 | 133 | 75 | 4 | 62.7 | 35.4 | 1.9 |
| 2 | 14 | 390 | 4 | 86 | 114 | 12 | 40.6 | 53.8 | 5.7 |
| 3 | 8 | 557 | 5 | 126 | 73 | 13 | 59.4 | 34.4 | 6.1 |
| 4 | 12 | 360 | 4 | 91 | 108 | 13 | 42.9 | 50.9 | 6.1 |
| 5 | 11 | 618 | 5 | 113 | 84 | 15 | 53.3 | 39.6 | 7.1 |
| 6 | 2 | 373 | 4 | 72 | 123 | 17 | 34.0 | 58.0 | 8.0 |
| 7 | 4 | 184 | 3 | 75 | 115 | 22 | 35.4 | 54.2 | 10.4 |
| 8 | 7 | 350 | 4 | 83 | 105 | 24 | 39.2 | 49.5 | 11.3 |
| 9 | 5 | 533 | 5 | 159 | 28 | 25 | 75.0 | 13.2 | 11.8 |
| 10 | 9 | 450 | 4 | 50 | 136 | 26 | 23.6 | 64.2 | 12.3 |
| 11 | 15 | 470 | 4 | 40 | 145 | 27 | 18.9 | 68.4 | 12.7 |
| 12 | 1 | 440 | 4 | 41 | 143 | 28 | 19.3 | 67.5 | 13.2 |
| 13 | 3 | 470 | 4 | 45 | 135 | 32 | 21.2 | 63.7 | 15.1 |
| 14 | 18 | 440 | 4 | 58 | 111 | 43 | 27.4 | 52.4 | 20.3 |
| 15 | 13 | 220 | 3 | 46 | 122 | 44 | 21.7 | 57.5 | 20.8 |
| 16 | 10 | 414 | 4 | 60 | 107 | 45 | 28.3 | 50.5 | 21.2 |
| 17 | 6 | 255 | 3 | 24 | 143 | 45 | 11.3 | 67.5 | 21.2 |
| 18 | 17 | 166 | 3 | 52 | 103 | 57 | 24.5 | 48.6 | 26.9 |

This particular percentage ranking dialog, taken again from my course file for PGA West, shows a ranking based on par percentage — note the "E" label in the middle column of both the count and percentage tables. The numbers along the left side of the dialog show the rankings of the holes, from highest percentage to lowest percentage.

To the right of the yardage and par information about the holes is the count table. It shows, for each hole, the number of times you have scored under (<), at, or above (>) the score in question. For example, on the first-ranked hole — the par-5 16th — I've had 133 scores under par, 75 pars, and four scores over par.

To the right of the count table is the percentage table. It shows, for each hole, the percentage of times you have scored under (<), at, or over (>) a certain score. Continuing with the example given above, on the first-ranked hole I've scored under par 62.7% of the time, at par 35.4% of the time, and over par 1.9% of the time.

The holes in this dialog are ranked according to the percentage of the time you shot at *or under* a particular score. In the illustration, for example, they are ordered according to the percentage of times par or better was shot on a hole. You can figure the score-or-better percentage for a hole by adding the numbers in the first two columns of the percentage table or, perhaps even easier, subtracting your over-score percentage from 100. You should note that, due to rounding error, the percentages for a hole might not add up to exactly 100%.

If two or more holes have the same score-or-better percentage, they are ranked in order of their under-score percentages — the hole with the highest under-score percentage will receive top billing. For example, the third- and fourth-ranked holes in the illustration — the 8th and the 12th — both have a par-or-better percentage of 93.9%. The 8th hole is ranked ahead of the 12th, however, because its under-par percentage is larger. Holes will have a tie ranking only when their under-, at-, and over-score percentages are identical.

The percentage ranking dialog is an instant MMMD, meaning it can be moved by its title bar and dismissed by clicking anywhere outside the title bar or pressing any key. Until one of these actions is taken, the percentage ranking dialog will remain visible.

### *Viewing a Summary of Previous Scores*

The next item in the **View** menu, **Last…**, allows you to view a summary of up to fifty of your previous rounds. This item will be active only when your course file contains three or more cards and is sorted by date. When you select the **Last…** item, the following dialog box will appear:

```
# of rounds to view:  [ 2 |±|
      [   OK   ]    [ Cancel ]
```

You can select the number of cards you want to summarize by clicking on the plus or minus boxes to the right of the number. When you have selected the number you want, click on the "OK" button or type "O", "o", Return or Enter. If you decide not to view the summary, just press the "Cancel" button, or type "C", "c", or Esc.

The minimum number of rounds you can summarize is two. The maximum number of rounds you can summarize is one less than the number of cards in your course file, up to an absolute limit of fifty. In other words, if your course file contains thirty-five cards, you could summarize the last thirty-four. If, on the other hand, your course file has sixty cards, you could only summarize the last fifty.

When it compiles this summary, PGSS™ treats any half-rounds you played as a whole round. For example, if you ask for a summary of your last ten rounds on an 18-hole course and one of those rounds is a card for the front nine only, the summary will be based on ten front-nines and nine back-nines.

After you've selected the number of rounds you want to summarize, the summary dialog will appear. For an 18-hole course, it looks like this:

| # | YDG | P | -- | - | E | + | ++ | +++ | !!! | Mean | Lo | Hi | +/- |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 440 | 4 | - | 12 | 35 | 3 | - | - | - | 3.82 | 3 | 5 | -0.18 |
| 2 | 373 | 4 | 1 | 16 | 30 | 3 | - | - | - | 3.70 | 2 | 5 | -0.30 |
| 3 | 470 | 4 | - | 9 | 34 | 7 | - | - | - | 3.96 | 3 | 5 | -0.04 |
| 4 | 184 | 3 | - | 18 | 28 | 4 | - | - | - | 2.72 | 2 | 4 | -0.28 |
| 5 | 533 | 5 | 6 | 35 | 5 | 4 | - | - | - | 4.14 | 3 | 6 | -0.86 |
| 6 | 255 | 3 | - | 10 | 33 | 3 | 4 | - | - | 3.02 | 2 | 5 | 0.02 |
| 7 | 350 | 4 | - | 24 | 24 | 2 | - | - | - | 3.56 | 3 | 5 | -0.44 |
| 8 | 557 | 5 | 6 | 30 | 10 | 4 | - | - | - | 4.24 | 3 | 6 | -0.76 |
| 9 | 450 | 4 | - | 14 | 30 | 4 | 2 | - | - | 3.88 | 3 | 6 | -0.12 |
| F | 3612 | 36 | 13 | 168 | 229 | 34 | 6 | - | - | 33.04 | 29 | 37 | -2.96 |
| 10 | 414 | 4 | 1 | 19 | 23 | 4 | 3 | - | - | 3.78 | 2 | 6 | -0.22 |
| 11 | 618 | 5 | - | 32 | 14 | 4 | - | - | - | 4.44 | 4 | 6 | -0.56 |
| 12 | 360 | 4 | 1 | 24 | 21 | 4 | - | - | - | 3.56 | 2 | 5 | -0.44 |
| 13 | 220 | 3 | - | 11 | 29 | 3 | 4 | 1 | 2 | 3.22 | 2 | 7 | 0.22 |
| 14 | 390 | 4 | 1 | 24 | 23 | 2 | - | - | - | 3.52 | 2 | 5 | -0.48 |
| 15 | 470 | 4 | - | 9 | 37 | 4 | - | - | - | 3.90 | 3 | 5 | -0.10 |
| 16 | 571 | 5 | 5 | 31 | 12 | 2 | - | - | - | 4.22 | 3 | 6 | -0.78 |
| 17 | 166 | 3 | - | 10 | 26 | 5 | 8 | 1 | - | 3.28 | 2 | 6 | 0.28 |
| 18 | 440 | 4 | - | 18 | 22 | 5 | 3 | 2 | - | 3.98 | 3 | 7 | -0.02 |
| B | 3649 | 36 | 8 | 178 | 207 | 33 | 18 | 4 | 2 | 33.90 | 30 | 41 | -2.10 |
| T | 7261 | 72 | 21 | 346 | 436 | 67 | 24 | 4 | 2 | 66.94 | 59 | 75 | -5.06 |

The name of the summarized course and the number of rounds summarized will be shown in the title bar. Apart from that, the summary dialog looks a lot like your course file window. It contains exactly the same information, except that individual scorecards are not displayed and there are no buttons. The summary dialog is read and interpreted just like a course file window.

The summary dialog is an instant MMMD, which means it can dragged around the desktop by its title bar. It will remain visible until you click anywhere outside the title bar or press any key.

### *The Window List*

When any course file windows are open, the **View** menu will contain a list of those windows. The window list, if one exists, will be placed after the **Last…** item.

To activate a window and bring it to the front, select its name from the window list.

To activate a window, bring it to the front, *and* center it on the desktop, hold down the command key while selecting its name from the window list.

Any iconized windows will appear in the window list with a hollow diamond to the left of their names. In the sample **View** menu, for example, the window for PGA West has been iconized.

## PRINTING A PGSS™ COURSE FILE

PGSS™ can print the cards in a course file, along with the data contained in the distribution and averages areas of your course file window. The printing capabilities of the program are not as sophisticated as I would like, primarily because I hate working with the Print Mangler, er, I mean Manager. PGSS™ will, however, generate hard copy which is acceptable for all but the most genteel uses. If this program produces any response at all, I swear I'll go to Developer University and learn how to write magnificent printing code…

PGSS™ was designed to print on 8-1/2 by 11 paper, single-sheet or fanfold. It will print in both portrait and landscape modes. It prints in 9-point Monaco on a dot matrix printer (ImageWriter). For laser printers, print your document with font substitution turned on to get 9-point Courier.

To print information from a PGSS™ course file, select **Print…** from the **File** menu. A dialog will appear, asking you to select the kind of document you want to print.
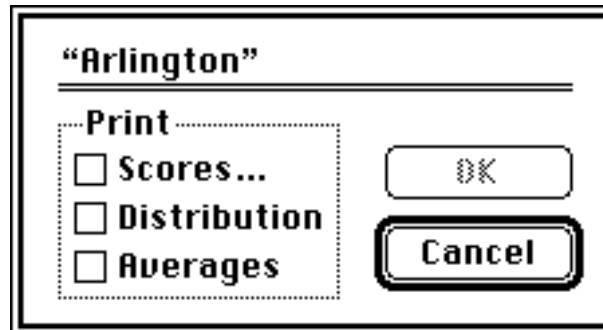


The name of the course file is shown at the top of the print selection dialog. Until you select a document to print, the "OK" button will remain inactive.

As you can see, PGSS™ allows you to print three different types of documents: a listing of your scores, your scoring distribution, or your scoring averages. The latter two documents will contain exactly the same information as is displayed in the distribution and averages areas of your course file window.

PGSS™ will not, however, allow you to print all three kinds of documents in the same print request. You can print either your scores, or your distribution and averages in a single print request. If you click on the "Scores…" check box, the "Distribution" and "Averages" check boxes will be cleared and made inactive. If you select the "Distribution" or "Averages" check boxes, the "Scores…" check box will be cleared and made inactive. If you want to print your scores, distribution, *and* averages, therefore, you must do it in two separate print requests.

If you decide you do not want to print from your course file, just press the "Cancel" button. You will return to your course file window and nothing will be printed.
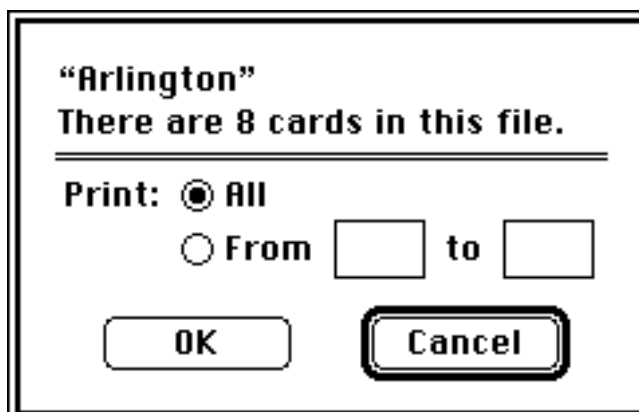
There are keyboard equivalents for every item in the print selection dialog. Using a keyboard equivalent is the same as pressing the mouse button on an item. The equivalents are:

| Item | Equivalents |
|---|---|
| Scores… | "S" or "s" |
| Distributio | "D" or "d" |
| Averages | "A" or "a" |
| OK | "O" or "o" |
| Cancel | "C", "c", Return, Enter, or |

### *Printing Scores*

You can print the scores in a course file by clicking on the "Scores…" check box in the print selection dialog. PGSS™ prints scores in the order in which they are sorted in your course file. If you have more than one card in your course file, PGSS™ will allow you to print a selected range of the cards.

If you are printing scores for a course file with more than one card, this dialog will appear after you have finished with the print selection dialog.

```
"Arlington"
There are 8 cards in this file.
─────────────────────────────
Print: ⦿ All
       ○ From [    ] to [    ]

    ( OK )        (( Cancel ))
```

This is the range selection dialog. It allows you to choose a range of cards to print. As with the print selection dialog, the name of the course file you are printing appears at the top. The range selection dialog also tells you how many cards are in that file.

The range selection dialog assumes you want to print all the cards in a course file. The "All" radio button will, therefore, be on when the dialog first appears. If you want to select a range of cards to print, just click on the "From" radio button, and the edit boxes to the right of that button will become active. You can then enter a range of cards you want to print. The numbers you enter in the edit boxes will correspond to the numbers of the cards in your course file window. If you are unsure of the range you want to print, just click on the "Cancel" button, return to the course file window, and use the arrow buttons or index to find the numbers of the cards for your range.

You can enter any three-digit number you want in the edit boxes. PGSS™ will, however, only accept values that fall between one and the number of cards in your course file. When you click on the "OK" button in the range selection dialog, PGSS™ checks the values you have entered. If either of them is out of range, PGSS™ will beep once and highlight the edit box of the offending value.

If you have entered acceptable values in the range selection dialog, pressing "OK" will take you to the standard Macintosh™ print dialog. You can leave the range dialog at any time by pressing the "Cancel" button. You will return to your course file window and no scores will be printed.

All of the items in the range selection dialog have keyboard equivalents. Using an equivalent is the same as clicking the mouse on an item. The equivalents are:

| Item | Equivalents |
| --- | --- |
| All | "A" or "a" |
| From | "F" or "f" |
| OK | "O" or "o" |
| Cancel | "C", "c", Return, Enter, or |

### *Printing Distributions and Averages*

The distribution and averages for a course file can be printed by clicking on their check boxes in the print selection dialog. You can print either or both of these items in the same print request. If you choose to print both of them, they will be put on the same page, if possible.

After you have selected one or both of these items, just click on the "OK" button in the print selection dialog and the standard Macintosh™ print dialog will appear.

# TECHNICAL APPENDIX

Making PGSS™ as fast as possible was a paramount design consideration. The results, I believe, speak for themselves.

To obtain that speed, though, required some tradeoffs. Since PGSS™ windows contain so much information — an 18-hole course file window, for example, displays 297 different items of data — I decided early on to do all of PGSS™'s drawing in offscreen buffers and blast the bits from those buffers into windows that needed updating. The effect of that is to make a PGSS™ window update seem virtually instantaneous.

The tradeoff comes in terms of memory usage. Each open PGSS™ window has an offscreen buffer. For an 18-hole window, that buffer uses 19,008 bytes of memory. In addition, each PGSS™ course file is loaded entirely into memory when it's opened. An 18-hole course file with a maximum of 500 cards in it, therefore, consumes another 25,572 bytes. That adds up to 44,580 bytes of memory — and doesn't even take into account what the system uses to maintain a window. Speed, as you can see, does not come cheaply.

Another area in which I splurged on memory usage was the dialogs which display round and course information. Since some of these dialogs show nearly as many items as a course file window, updating them by drawing each individual item would be noticeably, if not painfully, slow. To ameliorate this problem, PGSS™ only draws the information in these dialogs once, when the dialog first appears. It then converts the contents of the dialog window into a QuickDraw picture, and uses that picture for any subsequent updates. All of this behind-the-scenes stuff is transparent to the user.

The final area in which I put my programmer's snout deep into the memory trough was with the various and sundry lists PGSS™ displays — a course file's index and the list of found items. Each of these lists is a linked list of individual items created on the fly. Since all of these lists can, theoretically, contain up to five hundred items, PGSS™ puts the Memory Manager through quite a workout. It is a credit to the folks at Apple that things work as quickly and as smoothly as they do.

The memory requirements for PGSS™ may, therefore, seem extravagant. The simple fact of the matter is, however, that memory is cheap. And, really, compared to some of the blue-ribbon, best-of-fair memory hogs on the market, PGSS™ is little more than a piglet.

If you should encounter a low-memory situation in PGSS™, I have done my best to let you exit from it safely and gracefully. When it starts up, PGSS™ allocates a 32K block of reserved memory called a **monitor**. The monitor will be tapped only when PGSS™ has no other memory to use. If PGSS™ uses the monitor in the course of performing an operation, it will post an alert which informs you of that, tells you how dire the memory situation is, and suggests your next course of action. To be honest with you, I have never seen a memory alert while using PGSS™ in its

recommended partition size, even working with eight, 500-card, 18-hole course file windows open at the same time. If you change the partition size, however, you might see one. If you cannot recover from a low-memory situation in the way I have described, please let me know.

PGSS™ also preflights every call it makes to the Resource Manager. In other words, it checks to make sure a resource is available before it uses it. If PGSS™ tries to perform an operation which requires a missing resource, it will beep and not perform the operation. You should note that nothing in PGSS™'s resource fork is meant to be user-serviceable. Any changes you make to PGSS™'s resources are done at your own risk.

PGSS™ also checks the error codes from every File Manager call it makes. If it encounters an error in the course of performing a file operation, it will attempt to return the file it was working with to the state it was in before the operation began. It will then post an alert telling you the type of error which occurred. PGSS™ will explain the file error in reasonably plain English.

For you adventurous programmer types, here, as promised, are the file formats for PGSS™'s course files. Bon appetìt! — and, hey, be careful out there…

```
CONST

    kHole1 = 1;
    kHole9 = 9;
    kHole18 = 18;

    kEagle1 = -2;
    kBogey4 = 4

TYPE

HoleRecord = RECORD  { Hole description }
        par: INTEGER;
        ydg: INTEGER;
    END;

Holes09 = ARRAY[kHole1..kHole9] OF HoleRecord;  { 9-hole hole array }
Holes18 = ARRAY[kHole1..kHole18] OF HoleRecord; { 18-hole hole array }

RatingRecord = RECORD { Present but not used in PGSS™ 1.0 }
        usga: REAL; { USGA course rating }
        slope: REAL; { Course's slope rating }
    END;

Crs09Ptr = ^Course09; { Pointer to a 9-hole course }
Crs09Hdl = ^Crs09Ptr; { Handle to a 9-hole course }

Course09 = RECORD { This is a 9-hole course }
        next: LONGINT; { Unique ID number of next card in file }
        hole: Holes09; { Holes of the course }
        cA: HoleRecord; { Total yardage and total par }
        rtng: RatingRecord; { Not used }
    END;
```

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```
Crs18Ptr = ^Course18; { Pointer to an 18-hole course }
Crs18Hdl = ^Crs18Ptr; { Handle to an 18-hole course }


Course18 = RECORD
      next: LONGINT; { Unique ID number of next card in file }
      hole: Holes18; { Holes of the course }
      cF: HoleRecord; { Total yardage and total par — front }
      cB: HoleRecord; { Total yardage and total par — back }
      cA: HoleRecord; { Total yardage and total par — course }
      rtng: RatingRecord; { Not used }
   END;
Score09 = ARRAY[kHole1..kHole9] OF INTEGER; { 9-hole score array }
Score18 = ARRAY[kHole1..kHole18] OF INTEGER; { 18-hole score array }

Card09Ptr = ^Card09; { Pointer to 9-hole card }
Card09Hdl = ^Card09Ptr; { Handle to 9-hole card }


Card09 = RECORD { A 9-hole scorecard }
      ID: LONGINT; { Unique ID number of card }
      date: LONGINT; { Date of card, i.e., seconds since 1/1/1904 }
      score: Score09; { Scores }
      sA: INTEGER; { Total score }
   END;


Card18Ptr = ^Card18; { Pointer to 18-hole scorecard }
Card18Hdl = ^Card18Ptr; { Handle to 18-hole scorecard }


Card18 = RECORD { An 18-hole scorecard }
      ID: LONGINT; { Unique ID number of card }
      date: LONGINT; { Date of card, i.e., seconds since 1/1/1904 }
      score: Score18; { Scores }
      sF: INTEGER; { Score on front }
      sB: INTEGER; { Score on back }
      sA: INTEGER; { Score on course — equals 0 if card is half-
round }
   END;


FileHeaderPtr = ^FileHeader; { Pointer to file header }
FileHeaderHdl = ^FileHeaderPtr; { Handle to file header }


FileHeader = RECORD { Access to common data of 9- and 18-hole files }
      hDataOffset: INTEGER;
      hLstCard: INTEGER;
      hCurCard: INTEGER;
      hCurSort: INTEGER;
      hOpnCard: INTEGER;
      hOpnSort: INTEGER;
   END;


MeanRecord = RECORD { Averages of hole, nine, course, etc. }
      tot: LONGINT; { Total strokes }
      mean: LONGINT; { Mean score — implied hundredths decimal point }
      lo: INTEGER; { Low score }
      hi: INTEGER; { High score }
      diff: LONGINT; { Par differential — implied hundredths }
   END;
```

```
CMR09Ptr = ^CMR09; { Pointer to 9-hole course mean record }
CMR09Hdl = ^CMR09Ptr; { Handle to 9-hole course mean record }


CMR09 = RECORD { A 9-hole course mean record }
   rA: INTEGER; { Total rounds played }
   mHole: ARRAY[kHole1..kHole9] OF MeanRecord; { Hole mean records }
   mA: MeanRecord; { Total mean record }
   END;



CMR18Ptr = ^CMR18; { Pointer to 18-hole course mean record }
CMR18Hdl = ^CMR18Ptr; { Handle to 18-hole course mean record }

CMR18 = RECORD { An 18-hole course mean record }
      rF: INTEGER; { Total rounds — front }
      rB: INTEGER; { Total rounds — back }
      rA: INTEGER; { Total rounds — course (see notes) }
      mHole: ARRAY[kHole1..kHole18] OF MeanRecord; { Hole mean records
}
      mF: MeanRecord; { Total mean record — front }
      mB: MeanRecord; { Total mean record — back }
      mA: MeanRecord; { Total mean record — course (see notes) }
   END;


DistRecord = ARRAY[kEagle1..kBogey4] OF INTEGER; { Distribution record
}

CDR09Ptr = ^CDR09; { Pointer to 9-hole course distribution record }
CDR09Hdl = ^CDR09Ptr; { Handle to 9-hole course distribution record }

CDR09 = RECORD { A 9-hole course distribution record }
      dHole: ARRAY[kHole1..kHole9] OF DistRecord; { Hole distributions
}
      dA: DistRecord; { Course distribution }
   END;

CDR18Ptr = ^CDR18; { Pointer to 18-hole course distribution record }
CDR18Hdl = ^CDR18Ptr; { Handle to 18-hole course distribution record }

CDR18 = RECORD { An 18-hole course distribution record }
      dHole: ARRAY[kHole1..kHole18] OF DistRecord; { Hole distribution
}
      dF: DistRecord; { Total distribution — front }
      dB: DistRecord; { Total distribution — back }
      dA: DistRecord; { Total distribution — course }
   END;

WData09Ptr = ^WData09; { Pointer to 9-hole course file }
WData09Hdl = ^WData09Ptr; { Handle to 9-hole course file }

WData09 = RECORD { A 9-hole course file }
      wDataOffset: INTEGER; { Offset, in bytes, from here to 1st
card }
      wLstCard: INTEGER; { Number of cards in file }
      wCurCard: INTEGER; { Card currently being displayed }
      wCurSort: INTEGER; { Current sort order of file }
      wOpnCard: INTEGER; { Card displayed when file was opened/saved }
```

```
              wOpnSort: INTEGER; { Sort order when file was opened/saved }
              wUnused3: INTEGER; { RESERVED FOR FUTURE USE }
              wUnused4: INTEGER; { RESERVED FOR FUTURE USE }
              wUnused5: INTEGER; { RESERVED FOR FUTURE USE }
              wDist: CDR09; { The course's distribution }
              wMean: CMR09; { The course's mean record }
              wCourse: Course09; { The course's hole information }
              wFlags: INTEGER; { Special information — see notes }
          END;


  WData18Ptr = ^WData18; { Pointer to an 18-hole course file }
  WData18Hdl = ^WData18Ptr; { Handle to an 18-hole course file }

  WData18 = RECORD { An 18-hole course file }
              wDataOffset: INTEGER; { Offset, in bytes, from here to 1st
  card }
              wLstCard: INTEGER; { Number of cards in file }
              wCurCard: INTEGER; { Card currently being displayed }
              wCurSort: INTEGER; { Current sort order of file }
              wOpnCard: INTEGER; { Card displayed when file was opened/saved }
              wOpnSort: INTEGER; { Sort order when file was opened/saved }
              wUnused3: INTEGER; { RESERVED FOR FUTURE USE }
              wUnused4: INTEGER; { RESERVED FOR FUTURE USE }
              wUnused5: INTEGER; { RESERVED FOR FUTURE USE }
              wDist: CDR18; { The course's distribution }
              wMean: CMR18; { The course's mean record }
              wCourse: Course18; { The course's hole information }
              wFlags: INTEGER; { Special information — see notes }
          END;
```

NOTES:


Since PGSS™ lets nine-hole scores be entered on 18-hole courses, the
rA field of a CDR18 record is somewhat superfluous since it contains
the number of full rounds played on the course. That number is of no
use when it comes to calculating the course scoring average for an 18-
hole course. If an 18-hole course contains scores for both the front
and back nines, PGSS™ will figure the course scoring average by adding
the scoring averages of the front and back nines together. It reminds
itself to do this by using the tot field of the mA record in wMean as
a LONGINT Boolean. If an 18-hole file has scores for both the front
and back nines wMean.mA.tot will be set to 1. If it does not, that
field will be set to 0.

The wFlags field in both 9- and 18-hole course files contains the WIND
resource ID number for the course file. This field got a lot of use at
one time but, as the program has evolved, it's become something of an
artifact.

The sort fields in both 9- and 18-hole courses, wCurSort and wOpnSort,
use a special format. The low byte of those integers contains the type
of sort. It will have a value from 0 to 5. Use the following constants
to interpret that value:

```
        kSortedByEntry = 0;              kSortedByFront = 3;
        kSortedByDate = 1;              kSortedByBack = 4;
```

```
         kSortedByHole = 2;                    kSortedByTotal = 5;
```

If the low byte equals kSortedByHole, then read the high byte to get
the number of the hole used for the sort. It will be a number between
1 and 18. If the low byte is not kSortedByHole, the high byte is
undefined.

The scorecards in a PGSS™ file are laid out end-to-end following the
wFlags field of WData09 and WData18 records. Eighteen-hole courses use
an 18-hole card even if scores for only nine holes are recorded.