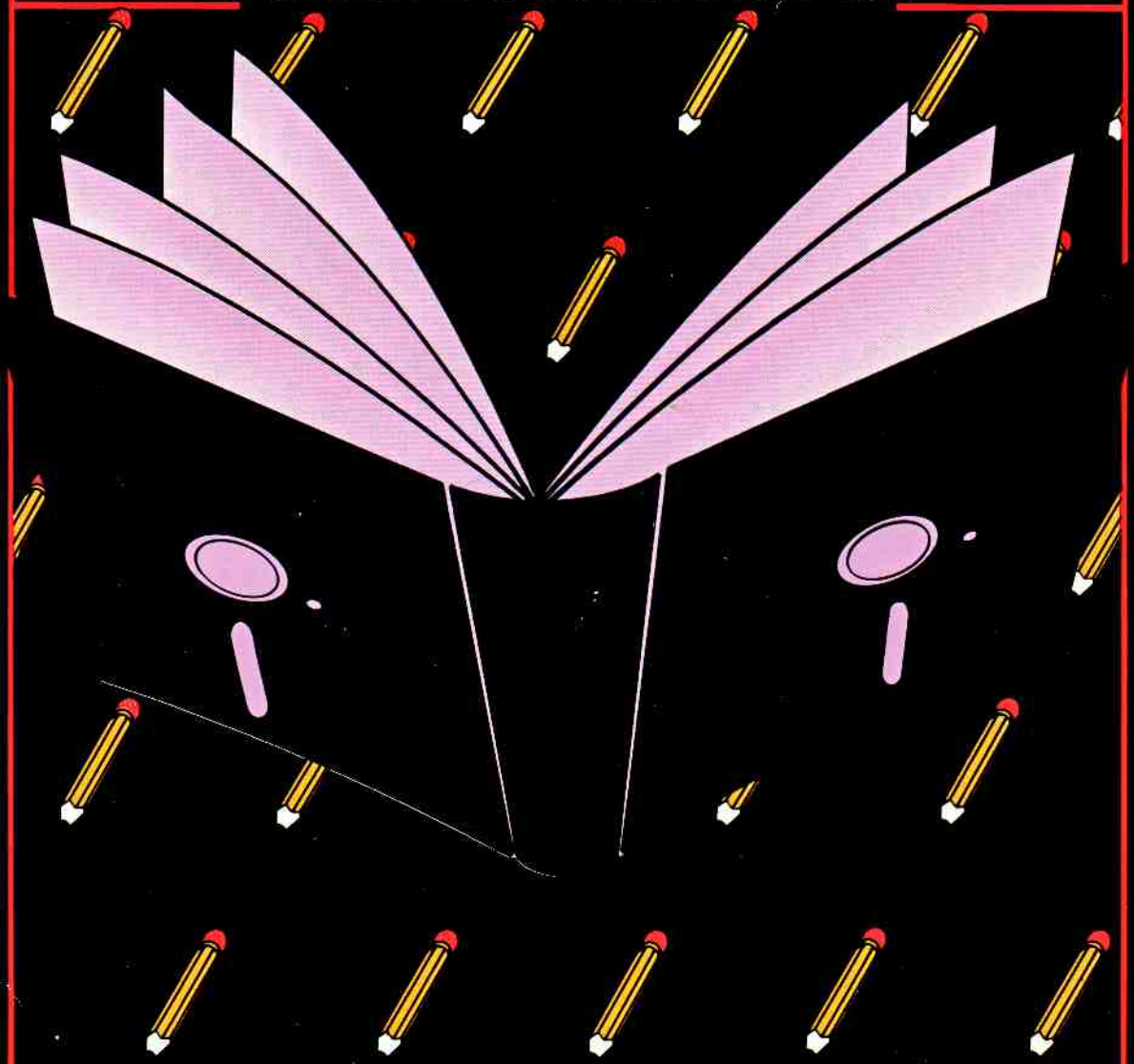
SOFTWORDS HARDWORDS

A COMMON-SENSE GUIDE TO CREATIVE DOCUMENTATION



Lucia McKay

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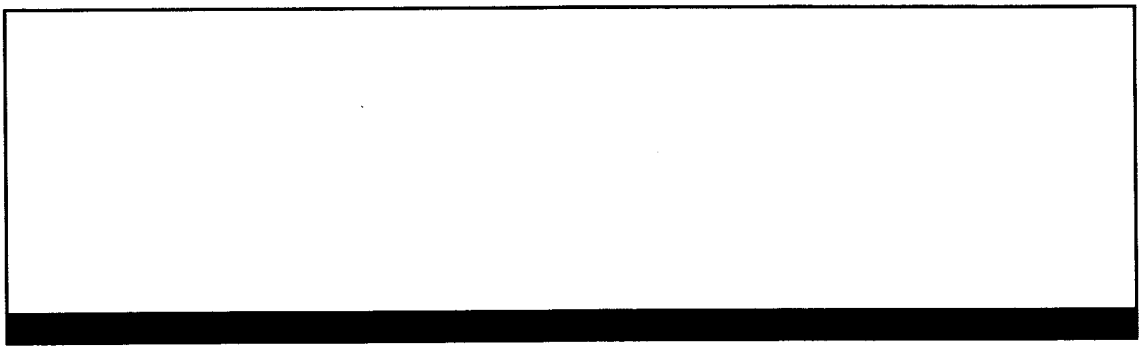
By Lucia McKay



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This book is dedicated to Mr. Dupree, without whom, nothing.

CONTENTS

CONTENTS

CONTENTS

CONTENTS

1

ASHTON·TATE

CHAPTER ONE

CODE FOR COMMUNICATORS

Documentation's time has come. Although it is the vital link between the world of high technology and the much larger world of ordinary people, documentation is little understood. I have met a number of professional and educated people who do not know what the word "documentation" means. Documentation writing is a profession so new that it isn't listed in the occupation codes of the unemployment office.

What then is documentation? In the world of computers, documentation used to mean the notes a programmer put in a program so another programmer could tell how the system was structured. It doesn't mean that anymore. Today, documentation is simply the directions that come with a piece of computer hardware or software. It is the manual, the guide, the instruction booklet. It is the third leg, with hardware and software, upon which computer technology must stand.

If documentation is just directions, why all the fuss? Two factors distinguish directions (such as the ones you get with your new camera or food processor) from hardware and software documentation. First, the writers of directions for appliances have always known that they were addressing innocent users, so they

CODE FOR COMMUNICATORS 2

at least *tried* to make the directions simple and clear, without assuming any specialized knowledge. (We all know that this effort is often feeble, as attested to by all the jokes about the frustrated parent frantically trying to assemble the bicycle on Christmas Eve.) Since the world of computers was, for two decades, a small incestuous one in which basic expertise and vocabulary was assumed, no one was seriously concerned about the need for communication with the outsider. Then the computer revolution exploded, and computer chips were not only a part of cars, refrigerators, and watches, but computers themselves began to appear on desks at home and in the office. Suddenly the operation and use of computers and their programs had to be explained to a whole world of "non-techies," people who didn't want to know the electronic vocabulary and details. The engineer writing for the engineer in tight, cryptic, technical jargon no longer did the job. Thus, "user documentation," as we now know it, was born out of the economic necessity to reach a mass market.

A second difference between documentation and other types of directions lies in the sheer quantity of the directions needed with computer hardware or software. The complex, sophisticated power of the software couldn't be explained in twenty pages with pictures, so manuals grew to be the size of books.

Writing instructions was no longer seen as a simple, quick task anyone could do; the professional writer of documentation became increasingly important.

WHAT THIS GUIDE CAN DO

This guide describes the elements of writing documentation for computer software, and much of this is also applicable to writing manuals for hardware. This is a practical how-to book, written directly from experience, and full of tricks-of-the-trade that can help anyone writing documentation for software.

CODE FOR COMMUNICATORS 3

WHO CAN BENEFIT FROM THIS GUIDE

If you are concerned with documentation in any way, you can find useful material in this guide, although all of it may not apply directly to you. Use the Table of Contents to find the sections that address your needs directly. If you are buying documentation, and want to know how to evaluate a manual, refer to the "Checklist for Quality" in Chapter Seven. If you are a programmer and want to write the documentation for your own software, Chapter Two is specifically for you. A writer who wants to get into the field of technical writing will benefit from reading the entire guide and using it for repeated reference. Furthermore, anyone who hires, trains, or manages documenters will find much of the material in this guide helpful in understanding the task of documentation, its processes and practitioners.

AN EXPLANATION OF THE CODE

The Code for Communicators, reproduced on the following page, is a statement of standards for professional technical communicators that has been adopted by the Society for Technical Communication (815 15th Street NW, Suite 506, Washington, DC 20005). This is a professional society for those engaged full time in technical communication. Their code emphasizes that the writer is responsible for how well the audience understands the message. The writer must not only *transmit* the message, but also do everything possible to make sure that the reader *receives* that message. This guide is all about what a writer can do to establish clear communication between a computer program and the person who buys and uses that program.

CODE FOR COMMUNICATORS 4

CODE FOR COMMUNICATORS*

As a technical communicator, I am the bridge between those who create ideas and those who use them. Because I recognize that the quality of my services directly affects how well ideas are understood, I am committed to excellence in performance and the highest standards of ethical behavior.

I value the worth of the ideas I am transmitting and the cost of developing and communicating those ideas. I also value the time and effort spent by those who read or see or hear my communication.

I therefore recognize my responsibility to communicate technical information truthfully, clearly, and economically.

My commitment to professional excellence and ethical behavior means that I will

- Use language and visuals with precision.
- Prefer simple, direct expression of ideas.
- Satisfy the audience's need for information, not my own need for self-expression.
- Hold myself responsible for how well my audience understands my message.
- Respect the work of colleagues, knowing that seldom is only one communications solution right and all others wrong.
- Strive continually to improve my professional competence.
- Promote a climate that encourages the exercise of professional judgement and that attracts talented individuals to careers in technical communication.

*Society for Technical Communication.

CHAPTER TWO

NOTE TO PROGRAMMERS

If you are a programmer who has written a piece of software, and you want to write the documentation for it yourself, there are several considerations to keep in mind. First, you are really wearing two hats—programmer and documenter. In some ways these roles are antagonistic because they involve two different viewpoints. As programmer, you know everything there is to know about the program. You know its ins and outs; you know all that it can do; you have both a global overview of the program and an intimate knowledge of its details. No one else will even be able to approach that degree of intimacy with the program until after months of use, and even then the view will be from the outside in (the viewpoint of the user) and not from the inside out (the viewpoint of the programmer).

A second consideration is that you have enormous pride in the program; it is your baby. The user, on the other hand, encounters your brilliant offspring with a degree of suspicion. The user has paid money for the program and has a set of expectations which the program may or may not be able to meet. The user is even more dubious about the learning process that must take place before the pro-

NOTE TO PROGRAMMERS 6

gram and its power become clear. No one likes feeling ignorant and unable to do everything at the start. Remember, then, that you, with your positive feeling about this piece of software, are attempting to communicate with a user who has covert negative feelings about the encounter. The documentation writer represents this user's viewpoint. For this reason, even if you are not doing the writing yourself, the atmosphere between you and the documenter may be hostile at first. That happens; it's natural; both programmer and writer must expect it and take it into account.

Third, you know everything that is *right* with the program and you have no trouble sailing through it. You do everything correctly at the first try and you know exactly what every word on the screen means. The writer, on the other hand, like the user, stumbles on everything that is *wrong*, each incomplete explanation, every ambiguity, every inconsistency. The user lacks your sureness of step and is apt to go down every wrong path. This means that the writer may discover errors that you never encountered. Naturally, it is hard for a programmer not to be defensive when a writer finds an error, and the writer has a tendency to be frustrated and angry at the "stupid program" that is impeding progress through the manual. Lots of patience and appreciation of other viewpoints is needed on both sides.

Fourth, as programmer, you may find it difficult or even impossible to believe that the user can be so ignorant. There are people walking past your office window every day for whom the words software, input, default, and byte have *no meaning at all.* Worse yet, words like record, file, disk, system, and function may have one meaning for you and another for them. You know precisely and exactly what you mean when you use such words; the listener (or user) also knows a precise meaning for those words. The problem is that these two meanings are often *not* the same.

NOTE TO PROGRAMMERS 7

As a documenter, I have had great difficulty convincing programmers that this state of ignorance still prevails in a world so dominated by technology. My most effective answer in this argument is simply to stop any five people and ask them what certain words mean to them. I always make my point; usually I can make it by asking the clerical people who work in a computer company. The documenter, therefore, must have a psychological mind-set that accurately reflects the viewpoint, vocabulary, and needs of the person who will buy and use the program. The documenter must also have both a macro and micro view of the program, and it is in this that the programmer has a real advantage in writing documentation.

It is not necessary for a documenter to be able to write a computer program. The documenter represents the unskilled viewpoint; the skill needed to create an efficient and effective program is not really relevant to the creation of excellent documentation. Remember that the average end user (end user means that the user is not a programmer or manufacturer but the final consumer—the ordinary buyer of an accounting program, for instance) never sees the program. The listings of commands written in a programming language are invisible; the end user sees only the effects of the program. The elegant sorting routines, the sophisticated storage of data, the tight code will never be seen or appreciated by the average end user.

On the other hand, the programmer acting as documenter must be a writer as well as a programmer. Good documentation sells software. A prospective buyer may examine only the manual before a software purchase, and documentation may be the crucial reason a buyer selects one piece of software over another.

This guide cannot teach a programmer how to write from A to Z. What this guide can do is remind you of or teach you lots of details you may have forgotten, details that apply directly to technical writing. It can also help anyone avoid some

NOTE TO PROGRAMMERS 8

of the common errors many documenters fall into unknowingly. The best documentation, moreover, is most efficiently written by teamwork between a professional writer and the programmer. This ideal situation is not always possible, so the goal is to maximize the effectiveness of the documentation, regardless of who is writing it.

If you, as programmer, are writing your own documentation, you will have to go back and forth between the two viewpoints of inexperienced user (writer) and expert (programmer). Remember that the user will do what the directions *actually* say, and not what you know should be done, or what you *meant* to say. You must forget what you know, and only do what you are told, misunderstanding if you possible can. Then you can begin to anticipate the misinterpretations and confusions of the end user.

Whether programmers act as their own documenters or as part of a team that produces documentation, their expert knowledge provides the technical content of the documentation. The next section discusses some essential elements of that content.

INFORMATION THE DOCUMENTER NEEDS

The programmer is one main source for information about the program; the other principal source should be a working copy of the software which the documentation writer can run on a computer. In the early stages of development, it is often very effective for the programmer to provide audio cassette tapes for the writer. I always tape any technical meeting or discussion so that I can refer to it later. (I obtain the permission of those involved prior to taping.) Taping is especially important when I am just beginning a project, and I don't know what the words mean. Until I understand the new topic, I don't know enough to take

NOTE TO PROGRAMMERS 9

accurate notes or to be sure that I'm not misunderstanding or forgetting something important. Tapes of conversations allow me to go over something until I get it.

Another advantage of taping the bulk of information about a program is that the programmer and documenter don't have to keep the same working hours, thus saving time for both.

Bliss, in his book *Getting Things Done,* addresses the programmer this way:

"The advantages of the machine are obvious: it permits you to dictate at your own speed, stopping whenever necessary and for as long as necessary to check facts, or to reorganize your thoughts, without wasting someone else's time. If a word is missed, (the documenter) can replay the segment, instead of interrupting you to ask you to repeat it. And you can dictate when (the documenter) is doing something else, or when you are alone in the office. . . . One caution about dictating machines: many people tend to become too wordy when talking into them. Keep it concise."[1]

The writer may ask the programmer to write a first draft for some of the highly technical information (file structure and so on). The programmer has final responsibility for reviewing and assuring the technical accuracy of the manual.

The use of tapes to capture the bulk of the information does not, of course, substitute for conferences and questions (also taped) between programmer and documenter. The documenter needs to keep up with all the visible changes in the program and will undoubtedly need to ask clarifying questions. Some sug-

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[1]Edwin C. Bliss, *Getting Things Done* (New York: Bantam Books, 1976), pp. 49-50.

NOTE TO PROGRAMMERS 10

gestions follow about the essential information that a writer needs from the programmer.

PROGRAM INFORMATION LIST

When you, the programmer, are making a tape, I, as documenter, need to know these things. In general, these same items apply to any text that explains a screen.

Please *tell* me:

1. ***What section*** **you're about to discuss.**
2. **The *page number* of the screen you are talking about.**
3. ***How many spaces*** **are in any field the user is going to type in and any special restrictions—such as numbers only.**
4. ***What is filled in automatically*** **by the program and what the user must supply.**
5. **How to get *out* of any screen; how to go *backward* (to the previous screen) and *forward* (to the next screen).**
6. **How to *change* entries on the screen.**
7. **How to make *corrections* later.**

NOTE TO PROGRAMMERS 11

8. *Special* features, exceptions, limitations.

9. *Warnings* of last chance or crucial decisions.

10. *Definitions* of terms and abbreviations (the *first* time they appear; there is no need to repeat this).

11. *When* you have finished talking and it is the end of the tape.

Please *do* these things:

1. Speak clearly, concisely, and to the point.

2. Tell me what *isn't* obvious from reading the screen.

Please *don't* do these things:

1. Describe the screen—I'm looking at it as I run the program.

2. Repeat what I can read from the screen or standard procedures once you've told me—just say "in the usual way".

A large documentation department may give a list such as the preceding one to every programmer the writers work with. It can save lots of confusion at the beginning of a project. Additionally, programmers are sometimes shy and nervous when talking to a writer about their programs. Every programmer cher-

ishes the delusion that his or her program is perfect. An awareness of these feelings, combined with routines and information (such as the previous list) that help smooth the path, increases our mutual efficiency in getting the task done.

STANDARDS FOR SCREENS

Programmers who have had a chance to work closely with an experienced documenter in the early stages of developing a program are usually eager to get a writer involved at the outset of every project. Writers can be helpful in many ways during the design of a program. A writer can help make sure that every word that is used on the screen has a single meaning. A writer can also assure that each element in the program is referred to in the same way every time. For example, if the "customer number" is sometimes referred to as the "customer account number," confusion results.

The following set of standards is designed for a menu-driven set of business accounting programs. It is an example of the sort of standards programmers and writers can develop together. When policies of this sort are specifically set down, new programmers and writers can be trained more easily, and a series of products can be made both internally and externally consistent.

LIST OF DOCUMENTATION STANDARDS FOR SCREENS

1. Main Program Menu

In general, main titles are nouns *only* (areas of program); subtitles are *verbs* (specific activities).

NOTE TO PROGRAMMERS 13

2. Each option on the main program menu has a submenu with further options such as:

   (1) Print Monthly Summary

3. The user never has to make the same choice twice in a row on two menus.

4. Anything referred to as a "menu" is a list of numbered options (as in "ESCAPE returns you to the previous menu").

5. Words of screen titles, options, and report titles match *exactly* when they refer to the same thing.

6. Format and words on screens are exactly parallel whenever possible.

   For example: enter client
   enter customer

7. Entering a *choice* (which client number?, which folder number ?) should be on a *form* to be filled in—not a menu.

8. Descriptive messages and information (except for dire WARNINGS) should not be shown on the screen unless there is an option at the beginning to suppress this information. The screen is great for *demonstration.* As a device for explanation, the printed page is better for most users. Don't have HELP messages appear by default unless they can be suppressed.

NOTE TO PROGRAMMERS 14

9. Keep screens simple, bare, and uncluttered. All information shown on the screen should be vital at that time—otherwise leave it out.

10. Titles of reports should be short and accurately reflect the content. They need not give all the details.

11. Consistency in wording, spacing, and format is vital. The best surprise is no surprise.

12. ENTER/REVISE all data. Do *not* "update" or "modify."

13. The act of designating or indicating what happens to certain transactions is called "*marking*", not "editing." Do *not* use "edit."

14. An error message or title may have a short form and a long form but they should be identical except for omitted or abbreviated words. Do *not* rephrase or change the order.

15. Any field that interfaces with or duplicates a field in another program should have exactly the same specifications.

16. Use ERASED, not "purged."

17. Use ABANDON instead of "abort."

18. A slash is used between two words to mean "and-or." For example: Enter/Revise, Customer/Vendor, Delete/Active. Try to avoid other uses of the slash.

NOTE TO PROGRAMMERS 15

19. When the user is not allowed access to a certain field on a form, N/A should appear on that line. ("Not Applicable" is an exception to the "slash" equals "or" rule.)

20. The standard forms are these:

    You have the following options available:

    Please enter your choice: ( )

    Are you merging data? (Y/N) _____

21. The form for closing books looks like this:

    End-of-Period/Year Processing

22. Ampersands (&) are used on screens and reports *only* when space makes it impossible to use "and." When there is room, spell out "and" even though it may have been abbreviated in the same phrase elsewhere.

23. Use single *letters* for options, *not* coded numbers such as zero and one.

    For example: Screen or Printer? (S/P) _____

24. Use standard abbreviations when you need the space. Check with the Documentation department for standard forms. Abbreviations should not look like misspellings.

NOTE TO PROGRAMMERS 16

25. Screens that are captured and reproduced in the manual should *not* contain any specific data. Inclusion of data leads to trouble later.

26. Every single report should fit on one or more standard 8-1/2" x 11" pages *without* the use of a special setting (condensed print, for example), special print wheel, or special symbols. Avoid vertical lines where possible.

27. Reports in the Reports Section contain the transactions entered in the How-To tutorial session.

28. Avoid the use of the words "file" and "record" and "field."

    Here's why:

    If I speak of "my insurance records" at home, I am typically referring to several file folders.

    The terms "files" and "records" are not, in common usage, always related in the same way. Sometimes "files" are the superset, sometimes the subset.

    "Field" is commonly used as a very general overriding term, *not* as a subset of records.

    The section on "Forbidden Words" in Chapter Four has some ideas about how to get around using these ambiguous terms.

CHAPTER THREE

BASIC STYLE FOR TECHNICAL WRITING

Technical writing differs from other prose writing in several important ways. Good writers, proficient in turning out excellent essays or expository articles for magazines, have to change their habits in order to write effective manuals.

Manuals have an immediacy, simplicity, and directness unique to their function. The manual may be the only teaching tool or tutorial that the user has to work with on a particular system, and it must also function as an effective reference tool.

PAGE DESIGN

The first topic in this chapter is page design, not because it is the most important topic, but because it is one of the first topics a writer must consider.

As you begin to write, you are creating the basic page design. Decide carefully about spacing and other conventions at the very beginning. It is much easier to establish your conventions at the outset than to reformat all the paragraphs and

pages later on.

Direct simplicity is the fundamental style. For this reason, include any decoration to the page only if it is absolutely necessary. Marketing managers in computer companies are all hooked on bullets—those little raised o's or asterisks that precede each point of a list. Resist the use of bullets—they tend to be a nonfunctional decoration.

Indulge in all capital letters, quotes, hyphens, bolding, and underlining only in a limited and disciplined way. Exercise self-restraint; there will be great pressure on you from those whose greatest experience is in writing advertising to decorate the page excessively.

Advertising is a one-time, grab-'em-as-they-run method of communicating. Don't let the style of the product brochure creep into your manual. That style is inappropriate to the function of a manual. A manual must soothe, not arouse. It must convey the truth, not shade the facts. It must last for a long time, not be thrown away next month. It must give all the details, not gloss the surface.

As you design the page of your manual or documentation and choose from among your format options, keep in mind the results of studies in readability. Research shows that ragged right is easier to read than justified text, in part because a varied line length helps keep the reader's eyes from tiring. Justified text makes a nice neat line at the right margin, but it does so at the expense of putting weird little spaces between the words and letters. Though right justification has become very fashionable, technological exhibitionism should give way to the sensibilities of the reader. Use ragged right unless you have a good reason to do otherwise.

Ragged right also saves time and patience by eliminating decisions on hyphenation. I have a personal prejudice against hyphens. I have not read any readability studies on hyphens, but I find myself stumbling over hyphens at the

end of a line. I have no negative response to the very ragged right edge that results from giving up hyphenation. I also believe in reducing the number of routine decisions whenever possible; it takes enough time and concentration to select each word.

At the same time that right justification was in vogue, the use of type faces without serifs (those little horizontal lines that occur, for instance, at the bottom of the "i") became the true sign of modernity. If you were going to be high tech and modern, you had to use right justification and sans serif (undecorated) type faces. Again, research exposed this fad. Since serifs lead your eye along, type faces with serifs prove to be easier and faster to read.

Decide at the outset what style of indentation you want to use. I personally prefer the neat blocky look that results from omitting the traditional indentation for the first line of the paragraph. There is, however, a serious drawback to this kind of paragraph.

Technical material is always full of tables, charts, lists, and examples. Often you will quote a few lines directly from the screen followed by a few lines of explanation. In reading this broken-up page, the reader has real problems telling when you have begun a new paragraph. Indentation thus becomes an important clue.

Space is a very important consideration. It can give emphasis to material and it keeps your manual from appearing crowded and threatening. Space, however, is expensive. You will find yourself, in many situations, trying to keep the manual from growing too thick. A thick manual is formidable; it puts off the timid user. Your decisions about how much space to have between paragraphs, after titles, and so forth, must be made in the light of the overall length of the manual. Chapter Eight discusses this problem further.

The basic style for technical writing is short paragraphs made up of short sentences. Avoid lists and outlines, as well as essays. This style is easy to read and

lets you quickly extract the pertinent information. On the other hand, it isn't choppy, which lists and phrases tend to be.

Standard rules of paragraphing do not always apply to manuals. Sometimes a paragraph just explains a step in a process. The script style of writing formats the page into two columns with the actor (who does it) on the left, and the action (what to do) on the right. This style can be easy to read and is good for simple instructions. If you are explaining a complex system (how to put your company books on a financial accounting system, for example) you must write more than a series of steps to be followed faithfully. The script style may not leave enough room for explanations and descriptions.

Bear in mind that the best styles for page design in the printing and production of books are not necessarily best for manuals. Technical manuals require special design considerations.

TWO BASIC RULES

Consider the difference among these three ways of phrasing:

---

1. After the difficulty is corrected

2. After the problem is fixed

3. After you fix the problem

Number (1) is a little pompous and formal, and both (1) and (2) are written in the

passive voice. In general, number (3) works best. The active voice ("you fix" instead of "is fixed") makes clear the responsibility for the action. Try rewriting any paragraph in a manual using only the active voice. This one change transforms both the tone and the readability of the paragraph.

We slip into the passive construction unconsciously in order to evade responsibility. Take the trouble to rewrite your sentences in the active voice and suddenly a welcome clarity emerges. When you identify clearly the actor in an action, you create a simplicity that fosters understanding in the reader.

The first rule, then, and the most important for effective technical as well as non-technical writing, is "Try to have every sentence in the active voice." This single characteristic makes more difference than any other. Of course, it becomes contrived and awkward to have active sentences 100 percent of the time. Sometimes I get tired, and let the passive construction slip in. Sometimes I leave it for the sake of variety. Nevertheless, I strive constantly for "every sentence an active sentence" when writing instructional manuals.

The second rule is this: Always write in the present tense. As you write a manual, you really cannot know what the reader is doing. It is tempting to write such a sentence as this:

When you press Button A, Action B will follow.

That little word "will" causes all kinds of problems. You have already taken up the future tense for the second action. If you want to describe an action that takes place after that, you have no way to make that future clear.

The above construction leads to a page sprinkled with "will." Such a page is awkward to read and confusing. The path out of this dilemma is simple. Red

BASIC STYLE FOR TECHNICAL WRITING 22

pencil every "will" you see. Write everything as if it were taking place at this very moment.

When you press Button A, Action B follows.

When rigorously applied, these two rules—use the active voice and use the present tense—keep your writing crisp and clean. I don't claim they are easy to follow, but I am sure they are worth the effort. They actually transform the way your writing reads.

PRINCIPLES OF COMMUNICATION

After you have rewritten your sentences to follow the two basic rules, test any writing you have done against the following principles:

- Is it true?
- Is it clear?
- Is it friendly?
- Does it flow?

This list gives the principles in descending order of importance. One eternal reality of technical writing is that it is always supposed to be ready yesterday. You, as writer, will always be in a hurry and under pressure to "get it out."

The standard that every technical document must meet is that of truth. The document must describe accurately in every detail how the program behaves. If the document says that Action B results from pushing Button A, then that must indeed be what happens. Even a preliminary draft of a manual must convey accurate facts. It may not necessarily tell the *whole* truth; details may be added in later versions, but what it says must be true as far as it goes.

There are manuals afloat written from the specifications and descriptions of a

BASIC STYLE FOR TECHNICAL WRITING 23

projected piece of software, and not from running the software itself. In other words, the engineers and designers wrote a paper to describe what they *intended* to build, and the documentation was constructed on that basis. Unfortunately, the final product didn't match the specifications in some important details. As a result, the users of that particular software are frequently puzzled as they compare the manual to the screen.

It is often difficult to make the manual truthful. The marketing department may want to use the manual as a selling tool before the product is completed. Certainly the sales department wants to send out the product the second it is done, and they want a completed manual to send with it. That is usually impossible. *After* the program is finished, and all the last-minute changes have been made, the writer must verify the manual against the program for accuracy in details.

In the real world, total accuracy is seldom achieved. The rush to market means that careful checking usually takes place *after* the first sales instead of before. Your responsibility as writer on the project is to try to bring the schedules together, to write as much of the manual as you can while the program is being developed, and to bargain for as much testing time as you can get after the program is completed.

CLARITY

Once you have established the truth, or correctness, of your statements, ask yourself if what you have said is clear. Consistency is one of the most powerful ingredients for clarity. Don't list items in one order on page three and in a different order on page five. Each technical word should have a single stipulated meaning. Any ordered list should have reason behind that order (alphabetical, large to small, simple to complex).

BASIC STYLE FOR TECHNICAL WRITING 24

Never use initials or abbreviations (IBM, CDC, CRT, RAM, ROM, and so on) without parenthetical explanations. The reader has enough hard work to do without trying to remember codes and acronyms.

Clarity is also a matter of order. Write your descriptions in the same order that the steps are to be performed. Resist the temptation to insert interesting but unnecessary information. In order to be clear, you must at times be incomplete. The programmer will want to "tell all" down to the tiniest and most obscure detail. If your first explanation is exhaustive, it may also be incomprehensible, confusing, repetitious and threatening. Tell the story in stages—the big overall picture first, how-to details next, and the rare cases in an appendix in the back.

Suppose that only some readers will need the information in a certain paragraph. Put the sorting condition ("if you are using floppy disks") at the beginning of the paragraph. Then the reader to whom the paragraph does not apply can skip to the next section. Headings are also helpful in organizing the material in your manual.

Always drop the other shoe. If you say "first" be sure to follow up with "second." After you say "if you answer yes," don't forget to tell what happens if the answer was "no." Follow all possible branches and describe all the choices.

TONE

Keep in mind as you write that end users still find computers threatening and mysterious. No one likes to feel ignorant, and there are many first-time users who feel completely incompetent when faced with high technology. A recent study found that only six percent of the population owns personal computers, and three-quarters of the population do not intend to buy one. Of those who do own them, two-thirds use them primarily for games. Part of the reason that the use of computers is not more widespread among the population in general is the

lack of good instructions in the manuals.

Maintain a neutral psychological tone in order to minimize the fear and suspicion that may already be present in your reader. Such words as "the computer allows, permits, requires, demands, will not allow, rejects" tend to portray the computer as a menacing authority figure. You can almost always find a way around such harsh phrasing. (I like "the program enables you to.")

There is not much agreement on the definition of "a computer." I avoid this controversy. Usually, however, it is the *program* that asks, acts, writes. People have some perception that the program is written by humans, step by step. The hardware, or computer, is more mysterious and less controllable. Software is softer than hardware! I try to avoid creating a "big brother" out of the computer.

In the same vein, include the words "you should, you must, you ought" with great care. All of us have latent negative memories of a dictatorial teacher. Avoid the "I know better than you" lecturing tone that we associate with teachers at their worst. (Please don't interpret this as a broadside insult to teachers. I taught mathematics myself for twenty years, and I still hear myself falling, on occasion, into a didactic tone.) Teaching, at its best, is gentle guidance that provides information and structure for the learner. Effective teaching results in high-level performance by the learner. That is the goal of instructional manuals.

Manuals, from the very first draft, can and should be neutral in tone. After you have checked the preliminary manual for accuracy and clarity, you can, if you have time, work on making the instructions more friendly, and informality helps to create a friendly atmosphere.

Humor is a powerful, and somewhat dangerous, tool. It can relieve tension in the course of a long, complex series of steps, and it can keep the reader awake. Humor can, however, easily cross the line from funny to offensive. For this reason, humor in a manual must be gentle, not cruel, and must never make fun of

BASIC STYLE FOR TECHNICAL WRITING 26

any gender or racial or national group. Don't use anything that could be misinterpreted. A manual cannot risk offending in an attempt to be amusing.

There are readers who think dull equals professional and obscure equals technical. An informal, cheery tone may alienate these readers; they may feel that you aren't being sufficiently serious. I am willing to risk their displeasure. Such pomposity is a form of exclusion, and the purpose of a good manual is to include as many readers as possible.

I always want to have time to polish a manual enough so that the prose flows gracefully. I want the transitions to be smooth and the phrasing to be perfect. The fact of the matter is that I've yet to have that much time available. Nevertheless, I retain the goal.

KEEP IT SIMPLE, STUPID!

That phrase is abbreviated KISS and it is the perennial cry of the technical writer. The subject matter is complex enough. The writing need never be complex. It is, according to Jerome Bruner (see reference in Appendix D), always possible to express a complex idea in simple language so that it can be understood by anybody, at one level or another. Though it may always be possible, it is almost never easy.

When a team of writers works together in a documentation department, they help each other by editing out the extra words, cutting the sentences in half, and rephrasing convoluted constructions. When you are editing your own work, reread it with an eye for any word, any phrase, that can be omitted. The checklists in the next chapter show some examples of wordy phrases.

Simplicity, however, does not preclude repetition. The spiral approach to learning touches on each topic again and again, but a little more deeply each

time. Cut out the words that don't do any work, but repeat important ideas in different ways. Remember that you are writing for an intelligent and sophisticated person who may be totally ignorant, innocent, and inexperienced about computers.

Keeping it simple does not mean talking down or condescending to the reader. Simple declarative sentences need not be limited to simple words; use the most powerful and precise word you can find.

The following three examples illustrate the process of refining documentation. The first example was written by the programmer. The second was a first try by the writer. The third is a further refinement by the writer. Study the differences in the same content and see what effect the various ways of phrasing have on you as reader.

EXAMPLE: VERSION ONE

GENERAL INFORMATION

This module is designed to be run in conjunction with the financial accounting system. It's (sic) main purpose is to allow off-line entry of transactions which can later be merged into the main financial database with the use of the Special Options program in the File Maintenance Menu. It can be used on either floppy disk or hard disk systems, and requires the CP/M or MP/M operating system.

This module could be used in several ways:

1. Multi-user transaction entry in an MP/M System
2. Transaction entry from an alternate location

3. Transaction entry for an accounting period prior to closing the books for the previous period.

OPERATING INSTRUCTIONS

Before executing the module, the name files must be written to the multi-input data disk. This is accomplished with selection 3 in the Special Options Menu. The multi-input data disk may be the same disk as the financial accounting data disk or it may be a different disk. The files may may (sic) also reside on any user area (00-15) as long as the multi-input programs also reside on that user area. However, if multiple terminals are running different input modules (as on an MP/M system), they must be logged in on different user areas.

After the names files have been written to the multi-input data disk the module is executed by typing:

XYNTE

The first time the program is run, a CRC error in the terminal file will be detected, forcing the configuration program to be run. This process is identical to the configuration process in the financial accounting system. You will be required to configure your terminal, keyboard, printer, disk drives and passwords. Since the module is a one program disk system, it will not be necessary write (sic) the terminal customization file to another program disk.

BASIC STYLE FOR TECHNICAL WRITING 29

EXAMPLE: VERSION TWO

GENERAL INFORMATION

The module enables you to enter data for the financial accounting system in an *off-line* mode. This means that you can type in data at a terminal at one time and then *at another time* merge that data into the financial accounting system.

This module requires the CP/M or MP/M operating system. You can use this module on either floppy or hard disk systems.

The module makes it possible for you to separate (in both time and space) the procedure of *entering* the data from the actual *processing* the data. This means that you can use the module in several ways:

1. If you are using an MP/M System in which several terminals share a single computer, data can be entered at each separate terminal and then, with this module, merged into the financial accounting system.

2. You may enter data at a terminal in a location remote from your main computer (such as a branch store) and then, via floppy disk or modem, merge that data into the financial accounting system at the main location.

3. You may enter data for the current accounting period but hold it and not merge it into the system until you have closed the books for the previous period.

BASIC STYLE FOR TECHNICAL WRITING 30

EXAMPLE: VERSION THREE

GENERAL INFORMATION

The module enables you to enter data for the financial accounting system in an *off-line* mode. This means you can type in data at your terminal at one time and then *at another time* merge that data into the financial accounting system.

This module requires the CP/M or MP/M operating system. You can use the module on either floppy or hard disk systems.

The module makes it possible for you to separate (in both time and space) the procedures of *entering* the data and *processing* the data. This means you can use the module in several ways:

1. If you are using an MP/M system (several terminals sharing a single computer), you can enter data at each terminal and then, with the module, merge it into the financial accounting system.

2. You may enter data at a terminal located away from your main computer (such as a branch store) and then, via floppy disk or modem, merge that data into the financial accounting system at the main location.

3. You may enter data for the current accounting period but hold it and not merge it into the system until you have closed the books for the previous period.

BASIC STYLE FOR TECHNICAL WRITING 31

In the final version, the condensed, technical information on the original first page of the document expanded into seven pages of simplified explanation.

An old story says that it takes two people to paint a picture—one to paint it, and one to say "Stop." The same is true of writing. A good writer will always want to polish the page one more time. At some point someone must say "Stop!"

33

LASHTON·TATE

CHAPTER FOUR

CLEANING UP YOUR LANGUAGE

There are many details specific to the manual or manuals you are writing, and many of these details are dictated by the nature of the software you are documenting. The lists that follow provide standards for insuring consistency and clarity in the manuals you produce.

The point is not to follow every rule described here, but to make such lists for yourself and for those who work with you in order to achieve consistency. These are the sort of little niggling details that we think we will remember, but inevitably forget.

GENERAL GUIDELINES

Describe user actions this way:

1. **"Type" a word.**

   If the user enters more than one letter or a word, the verb is "type."

2. "Press" a key.

   If the user enters a single key (such as a number or the ⟨RETURN⟩ key), the verb is "press," as in "Press any key to. . . (initialize, continue, etc.)." Avoid "hit," "strike," and "depress" in this context.

   "Touch" is an acceptable alternative to "press."

   Always say "press the ⟨ESCAPE⟩ key," not "press ⟨ESCAPE⟩."

   Don't use ⟨ESC⟩ except on screens—use ⟨ESCAPE⟩ instead.

3. Use the form below for all function keys:

   use Press the ⟨RETURN⟩ key.

   not Press ⟨return⟩.

4. Refer to the line *on which* the cursor is positioned, not *in which.*

5. Be aware that we have two ways to denote identification numbers. Use "identification number" in written text and "ID#" on screens or when reproducing a screen. If "identification number" can possibly refer to more than one, specify the kind of identification number you mean. For example, employee identification number, invoice identification number, and so on.

6. In order to avoid confusion, do *not* use the word "note" in a sentence as in this

example: Note the bolding in the third line. Use, instead, an alternate word such as "notice." Save NOTE for the special notes that indicate an exception that only applies in certain cases.

7. Explain, if the program fills in a line, *where* it gets the information and in which chapter you previously entered that information. Keep the reader in touch with everything that is happening on the screen.

8. In screen titles, menu options, and the like, be consistent with singular or plural:

   not Print Reports
   Revise Report

9. Explain alternate ways of filling in data so that the alternatives are perceived as options (with certain conditions), not directives. Avoid an authoritative tone.

   avoid You must
   You may not
   cannot be used

10. If "No Option" appears on a screen as one item on a menu, explain that the choice is not yet available.

CLEANING UP YOUR LANGUAGE 36

THE DILEMMA OF HE AND SHE

It *is* important to pay attention to gender bias in language. Read the following paragraph and pay attention to how it strikes you emotionally. The original version is by Emerson.

"God offers to every mind its choice between truth and repose. Take which you please—you can never have both. Between these, as a pendulum, woman oscillates. She in whom the love of repose predominates will accept the first creed, the first philosophy, the first political party she meets—most likely her mother's. She gets rest, commodity and reputation; but she shuts the door of truth. She in whom the love of truth predominates will keep herself aloof from all moorings, and afloat. She will abstain from dogmatism, and recognize all the opposite negation between which, as walls, her being is swung. She submits to the inconvenience of suspense and imperfect opinion, but she is a candidate for truth, as the other is not, and respects the highest law of her being."[1]

No matter how many times a male reader is told that the feminine forms really refer to him, because they designate humankind in general, his inner being simply will not identify with what is being said. Similarly, the paragraph in the original form cannot permit female readers to totally identify with the statements made.

In English, the male pronoun has often excluded females and has only imper-

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[1] Emerson, Ralph Waldo, *The Selected Writings of Ralph Waldo Emerson*, ed. Brooks Atkinson (New York: Random House, 1968), p. 301.

fectly functioned as a neutral pronoun. Remember that more than half the population of this country is female. If you want to sell the product that you are documenting then watch the use of gender in your writing.

Unfortunately, there is as yet no truly graceful solution to this problem. The tendency to use a plural pronoun to make a singular noun a neuter is incorrect and painful to the well-educated eye. An example of this follows:

The customer can find their account number in the upper-right-hand corner.

The solution here is an easy one:

The customer can find the account number in the upper-right-hand corner.

Technical material, unlike philosophy, seldom refers to humankind in general and that does make the problem easier.

I have tried many solutions to the problem of gender. I rather like s/he, but I don't know anyone else who does. I also don't mind he/she. The use of that form to mean "he or she" seems as reasonable to me as the use of "customer/vendor" to mean "customer or vendor," but again, I can't find many who agree with me. In general, the style manuals advise against the use of such slashed forms.

I have also tried writing one page using male pronouns and the next using female, alternately throughout the material. That fails the grace test too.

Here are some workable guidelines that usually provide a way out of the dilemma:

CLEANING UP YOUR LANGUAGE 38

The second person form (you) is the best one for technical manuals anyway. It is informal and direct and avoids the problems created by the third person.

not **The user must enter his password.**

but **Enter your password.**

Should you lapse into the generalizations typical of philosophy, choose the neutral term.

not **Computers increase the productivity of mankind.**

but **Computers increase the productivity of people.**

or **Computers increase productivity.**

Make the noun plural and then you can correctly use the plural pronoun.

not **The owner must enter his customer names.**

but **Owners enter their customer names.**

If you are referring to a specific person, use the correct pronoun if you know it.

either **The file clerk found her report.**

or **The file clerk found his report.**

CLEANING UP YOUR LANGUAGE 39

Repeat titles to avoid pronouns.

not **The programmer enters the file, then he verifies it.**

but **The programmer first enters the file. Then the programmer verifies it.**

Select the neutral term.

not **workman, stewardess, authoress, spokesman, businessman**

but **worker, flight attendant, writer, speaker, business person**

If you care enough about achieving the neutral effect, you can always find a way around the inappropriate word. As a last resort, slip in the passive voice when all else fails.

not **The bookkeeper must evolve his own system.**

but **The system must be evolved by the bookkeeper.**

The *IEEE Professional Communication,* in December, 1979, put it this way:

"If we continue the traditional omission of either sex from particular roles or if we continue to accept the assumption that good intent alone resolves the problem, then there is little reason to attempt to change the language content of our scientific journals and technical reports. However, if we desire to rethink our use of traditional language for the sake of clarity and equity, then we must take the elimination

CLEANING UP YOUR LANGUAGE 40

of sexist language seriously. Language can be either a powerful weapon or a powerful tool."[2]

FORBIDDEN WORDS

Programmers use certain technical jargon that is perfectly clear to them, but may be obscure, confusing, or offensive to the reader who is not familiar with the high tech world.

AVOID THESE WORDS

abort	**Use "interrupt" or "abandon" as in "abandon merge."**
bring up the screen	**The system "shows" the screen, or the screen "appears."**
depress	**As in "press" keys. People can be depressed for a multitude of reasons, but keys never are.**
e.g.	**Use "for example."**
i.e.	**Use "that is."**
hit	**Don't encourage violence to the keyboard!**

[2] Billingsley, Patricia A. and Neil A. Johnson, "Nonsexist Use of Language in Scientific and Technical Writing," *IEEE Professional Communication*, Vol. PC-22, no. 4 (Dec. 1979), p. 1967.

CLEANING UP YOUR LANGUAGE 41

just As in "you just enter . . ."

purged Use "erased."

scan Not very meaningful to non-techies.

simply As in "simply press the ⟨RETURN⟩ key"

strike Violence again.

you control Say instead, "you operate."

use "Use," in all its forms, is a flag for imprecise thinking.

we Do not use the royal or editorial "we."

USE THESE WORDS WITH CARE

above & below In the final printing, the item to which you are referring may no longer be above or below. Use "previous" and "following" to avoid confusion.

allows Try to choose "enables." Avoid the subtle, authoritative tone, such as "The program allows you to. . ."

On the other hand, "Option 2 allows you . . ." is okay.

CLEANING UP YOUR LANGUAGE 42

& Do not use in text unless reproducing a screen option containing an ampersand. Write out "and" instead.

automatically Avoid constant repetition of "The program automatically . . ."

backup You can speak of a "backup disk" or a "backup copy" but avoid using just plain "backup" as a noun. Use "back up" as a verb only in the context of "back up a disk" or "back up a file."

data A collection of facts is data. Arranged meaningfully, data become information. *Notice* that "data" takes a plural verb.

disk When talking about "hard disks" or "floppy disks," in general, use the term "disk" rather than diskette or disc. Explain the differences between your terms in the beginning.

default Avoid if possible. If not, define or refer to the glossary.

etc. Acceptable, but use with due restraint.

field Ambiguous in general usage and confusing to the lay person when used technically. However, many programs use this term. Define it carefully. Some possible synonyms include "category," "item."

file Use only when the reader can visualize an actual manila file folder for what you mean —otherwise rephrase it. This is

CLEANING UP YOUR LANGUAGE 43

OK: The file contains information about the customer.

function Use only as in "this key performs this function."

record Ambiguous in general usage and confusing to the layperson when used technically. Again, it is used by many programs and may have to be defined for the reader.

system Use *only* to mean the software. The hardware configuration is the "setup."

will Do not use except for the *rare* case of a true future tense.

wrong: The program will fill this in.

right: The program fills this in.

NOTE CORRECT FORM OF THESE WORDS

⟨BACK SPACE⟩ as key name

backspace in any other context

chart of accounts

disk drives

CLEANING UP YOUR LANGUAGE 44

⟨ESCAPE⟩	as key name
first-year	as an adjective
floppy disk	
hard disk	
menu	unless part of a title
on-line	
printout	
run time	
startup	
word processing	
year-to-date	as an adjective
ZIP Code	all caps

CLEANING UP YOUR LANGUAGE 45

CHECKLISTS AND STANDARDS

The following list serves as a reminder of those awkward phrases we all tend to use. Clean up your prose by checking it against these common errors.

Instead of	Try this
the writer (or author)	I
parameters	limits
for the purpose of	for
initiate	begin, start
maximum quantity	most
in order that	so
function	purpose
in the event that	if
subsequently	later, afterwards

CLEANING UP YOUR LANGUAGE 46

at such time as	when
due to the fact that	because
the manner in which	how
with reference to	concerning
in view of the fact that	since
make inquiry regarding	inquire
inasmuch as	because
neat in appearance	neat
round in shape	round
five in number	five
remember the fact that	remember that
is at this time	is
each and every	every

CLEANING UP YOUR LANGUAGE 47

Every sentence in a manual should be a complete sentence. Phrases trying to pass as sentences are not only grammatically incorrect but they make the manual choppy. Technical material is by its very nature broken up; choose a style, therefore, that increases the flow rather than halts it. Check your sentences for ones that begin with "and" or "but." Get rid of these conjunctions and find a more precise transition.

Certain words are red flags that signal imprecise language. "Function" and "use" are two that pop up frequently in manuals. Implement is another. It's hard to avoid "use," but I find that when I rewrite to get rid of it, I am forced into a more accurate statement.

Repetition is a tricky issue in technical material. Always write (I was about to begin "always use") the same word for one element of the software. On the other hand, it helps to vary the phrasing in explanations; if the reader doesn't get it one way, maybe a different way of putting the idea will help.

A reliable and readable style guide is one of the most valuable tools a writer can own. My personal favorite, and the one I have decreed to be the standard for the various documentation departments I have set up, is *Words Into Type,* published by Prentice-Hall. It's good lunchtime reading, and my copy is liberally marked with highlighter. The index is excellent so that looking up details to settle arguments is easy. I learn something every time I refer to it. Choose this style manual or another, but agree to abide by a single standard. (Even the experts don't agree.) Select an authority and stick with it so that your work is internally consistent.

CHAPTER FIVE

POLISHING THE PROSE

You have available only a few devices (boldfacing, underlining, and uppercase letters) for emphasis if you are using a typewriter or a word processing program such as *WordStar* with the average dot matrix or daisy wheel printer. These three devices are also the only way to show categories of information or to indicate a particular type of instruction. If, for instance, you want to signal your reader "this is precisely what you are to type on the keyboard," you may want to put that text in all caps (uppercase letters).

The underlying principle for emphasis is this: overuse renders the emphasis ineffective. The third time on one page you read a sign saying DANGER! you simply cease to pay attention to or to believe the warning. On the other hand, if there is one DANGER! in the whole manual, you tend to believe and heed the warning. Therefore, be extremely conservative in your use of boldfacing, underlining, and uppercase.

The second principle for emphasis is to maintain meticulous consistency. This is also important when you are distinguishing categories of information. Decide *why* you underline a word and make sure that every word you underline passes that test.

POLISHING THE PROSE 50

USE OF BOLDFACE

Write words in boldface when they are needed for **later reference,** so that when the reader returns to the page, the relevant words stand out. It is reasonable to boldface words that appear in the glossary, since those words must also appear in the index.

I also boldface the following items:

NOTE and WARNING

Terms of limitation or quantity (such as "ten entries"), the *numeral only*.

EXAMPLE: This line has 15 spaces.

USE OF UNDERLINING

Underline those items that need emphasis now, as you read the sentence the first time. There is no need for the word to stand out later, it needs to make an immediate impression the first time. Read the sentence aloud to see what words you naturally emphasize with your voice.

Do *not* underline final punctuation or any punctuation that appears at the end of the underlined phrase.

Do *not* underline an entire sentence. Three words is about the maximum that remains effective, and too much underlining annoys the reader and spoils the effect. It also shows that the writer has not carefully thought through exactly

where the emphasis should lie.

PITFALLS OF PUNCTUATION

The points that I review in this section are those that seem to cause writers the most trouble. See a style manual for a more detailed description of standard rules.

Each punctuation mark should serve a purpose, should convey a signal to the reader. No one should notice your punctuation; it is simply there, quietly doing its job.

Don't capitalize, quote, boldface, or hyphenate unless there is no alternative or unless you can find such a requirement cited in a dictionary or style manual such as *Words Into Type*. Overuse diminishes effectiveness—no decorations on the page unless they have essential meaning.

HYPHENATION

As with all marks of punctuation, use hyphens only when there is a reason to. Hyphenate a word if it appears hyphenated in a dictionary of standard usage. Otherwise, leave the hyphen out.

I do *not* use hyphens at the end of lines. This is a personal preference, and the method by which the manual is reproduced or printed may dictate a change in this policy. If you do hyphenate, be sure to do it correctly. Keep a copy of a hyphenation guide by your keyboard.

COMMAS

Certain comma rules are controversial. The accepted form changes from one school generation to the next in much the same fashion as the length of skirts.

POLISHING THE PROSE 52

Don't get embroiled in comma fights; it isn't worth it. Establish a set of standards and follow them consistently.

In a series of three, use a comma before the conjunction. (Bread, butter, and cake were served for tea.) In other situations, use a comma if you pause when reading the sentence aloud; leave it out otherwise.

COLONS

In general, the material following a colon is in apposition to a word in the introductory sentence. It is incorrect to place a colon after an introductory statement when the statement is not a complete sentence.

WRONG:

The main features of the system are:

Monthly reports include:

RIGHT:

The main features of the system are these:

Monthly reports include items such as this:

A colon is used after an introductory statement that includes the expressions "as follows" or "the following."

POLISHING THE PROSE 53

OTHER PUNCTUATION

Use quotation marks only if you absolutely *must*. Check the position of periods and commas relative to quotation marks. See your reference manual for the rules.

It doesn't seem to make any sense to put the punctuation inside the quotation marks, but that is indeed where it goes. (Notice where the period falls in this sentence: He picked up the book and said, "Trash.") Some European countries handle this quote rule differently, and it is a much-resisted rule in this country. I use this little point as one of the criteria to separate the good from the excellent when I am hiring writers.

Check the position of periods and commas relative to parentheses. In general, the period goes *outside* the closing parentheses unless the parentheses stands alone and contains a complete sentence.

The period belongs to the sentence (and not to this remark).

(This sentence stands alone entirely within the parentheses.)

Capitalize within a line *only* if it would be unclear not to do so:

WRONG Fill in Today's Date with ....

RIGHT Fill in today's date with ....

"Option" is capitalized when followed by a number or letter, as in the following instruction:

POLISHING THE PROSE 54

Select Option 3.

COPING WITH NUMBERS

Use the numeral when designating pages or lines, or quantities above ten. Spell out the number for quantities zero through ten. Use numerals for all physical measures.

Page numbers are cited as follows:

EXAMPLES: **"page 3"**
"line 5"
"three pages of text"
"15 lines down"

In most technical material, only numbers under 11 are written out in words.

EXAMPLE: **There are 67 spaces to the line.**

However, when several numbers appear in the same context, the style for the larger numbers governs that for the smaller.

POOR: **There were 128 boys but only ten girls chosen.**

BETTER: **There were 128 boys but only 10 girls chosen.**

POLISHING THE PROSE 55

Spell out "#" if possible. It is *not* a universal symbol for number.

Commas within a large number help the reader to read and write the number correctly. (For example, there are 32,678 copies of this book.) However, in some contexts the commas can be confusing. Do not use a comma and a decimal in the same number.

To keep your sanity, avoid referring to page numbers. Instead, try to refer to a certain section in a certain chapter. Page numbers may change with every revision, and you will go crazy trying to find and change every obsolete reference to a specific page.

Incorrect page numbers are like the thirteenth stroke of a clock; not only are they wrong in themselves, but they cast doubt on all that went before. You must teach the reader to trust the information in the manual. If just a few items are wrong, then the reader will suspect all the other information about the program. We'll never achieve "zero defect" writing, but we can try.

Number only those items for which *numbering indicates sequence*. That is, don't number items following a statement such as this: There are three features of the program that. . . . A numbered list means that the first item *must* precede the second, and so forth. Also, numbers are followed by a period and *not* a parenthesis unless the period could be mistaken for a decimal point.

TRADEMARKS AND COPYRIGHTS

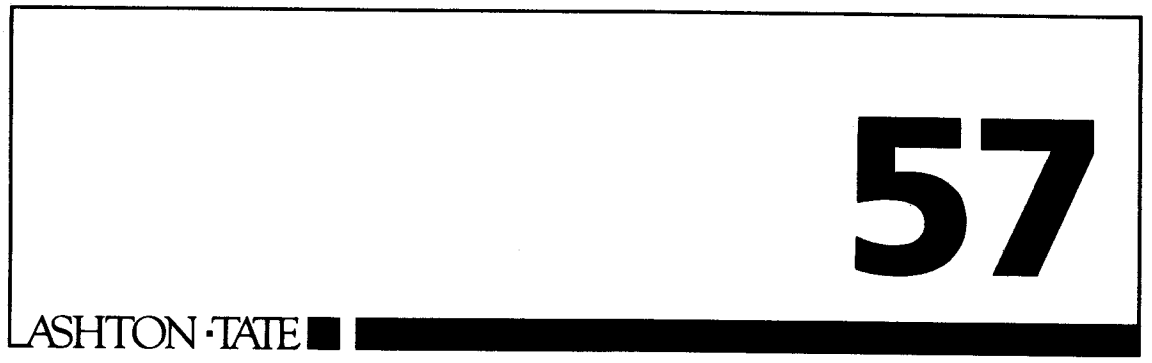
Always check with a lawyer to get the exact phrasing of the legal statements that typically begin a manual. If there is any question about quoting, citing other products, or protecting the product you are documenting, get the advice of an expert.

Never use the names of real people in your examples, unless they are your own

children. Be especially careful not to use celebrity names. If you change a name, make sure that you change it enough to make it only reminiscent of a famous person, and not just a variant spelling.

Construct sample addresses and phone numbers with care. The ZIP codes and area codes must be correct for the city, but the street and number should not exist.

If, for instance, you are using the personnel records of an imaginary company as a model, take the time to write up the dates and particulars of the people involved. Then publish these to all concerned (the programmer and other writers) and insist that they limit themselves to this well-constructed data. Otherwise you may find yourself with an employee's date of termination in 1982 and the date of hiring in 1983. It's easier to get the data consistent and correct in the beginning instead of making it up as you go along. (In one documentation department I know, we made up outrageous gossip about the people in our examples, but that never got into the manual!)



CHAPTER SIX

DESIGNING INSTRUCTION

Instruction is the goal of documentation. Any choice you make in writing and designing your manual should be measured against that goal. Though the manual for a piece of software may be used in many ways—as a tool to raise venture capital, as a piece of sales literature, as a publicity piece—all these uses are peripheral to the main purpose: the manual helps the software user to learn.

People learn in different ways, however. Even when you have carefully defined the audience (more about that in Chapter Seven), you still won't know the background, experience, or learning style of each reader. These factors will certainly vary widely in your readers.

Writers cherish the dream that each reader will start at the beginning and read through sequentially to the end. Almost no one reads a manual this way. Readers start at different places; they skip different paragraphs; some learn best from a flow chart; others want paragraphs of explanation.

The diversity each reader brings to the manual, and the variation in what the reader wants in a manual are two facts that we, as writers, may deplore but must accept. Don't let one reviewer or reader convince you that you are doing some-

thing wrong; try out your drafts on several different people who are as close to the projected readership as you can find.

In addition, design your manual to accommodate more than one learning style. One way to do this is to provide multiple paths through the manual.

PATHS THROUGH THE MANUAL

Show your readers how to sort themselves into various learning paths. You can accomplish this in a formal way with a pre-test or in an informal way with sorting paragraphs. The pages that follow show examples of sorting paragraphs. The introduction asks the readers to place themselves in one of three classes. Then, within the classes, the manual describes two ways (fast and slow) to obtain the necessary information.

INTRODUCTION

Do you want to learn NEWGRAF slowly and thoroughly, or are you in a hurry to get started because you have a specific graphics task that you need to get done *today*?

This chapter tells you what you can expect from the other parts of the guide, and where to find what *you* need.

Classify yourself as an A, B, or C user (according to your experience and background with computer graphics) by choosing the description that fits you best:

A. You are familiar with computer programming in FORTRAN but you have little or no experience with computer graphics.

DESIGNING INSTRUCTION 59

B. You are familiar with FORTRAN and you have some experience with computer graphics but you are not knowledgeable about the Graphics Kernel System.

C. You are familiar with GKS (Graphics Kernel System) but you need information about the specific implementation of the system that is NEWGRAF.

The pages which follow suggest several ways to use this guide depending on your needs and learning style. You need read only the *one* (A, B, or C) that applies to you.

PATH A

A. This path is for you if you have programmed in FORTRAN but have *little or no experience with computer graphics* of any kind:

The Graphical Kernel System is a very powerful programming tool and its great versatility means that it takes a little while to learn. After you become familiar with the basic vocabulary and elements of graphics programming, you will follow more easily the examples and descriptions of the 200 or so subroutines that GKS provides for you. Actually doing the examples is the fastest way to grasp the basics—nothing makes these complex tasks more clear than real hands-on experience with them.

IN A HURRY?

Chapter 5 (Graphical Output) contains some models and examples that you could modify if you have to generate some simple graphics right away and just don't have time to learn the system step-by-step. However, there are some complex concepts, and many possibilities for slip-ups, if you are blindly following a model without

really understanding what's going on. For this reason, it is a good idea for you to *take the slower path* through the introductory material and the tutorial examples before you actually tackle a task.

THE RECOMMENDED PATH:

Begin with Chapter 3 (An Introduction to Graphics). It tells you what computer graphics can do and describes the standard vocabulary for computer graphics.

Then go on to a careful reading of Chapter 4 (An Introduction to the Graphical Kernel System) which supplies the definitions for GKS and acquaints you with the power of the system.

After you have read these introductory chapters, work slowly through Chapters 5 through 17. That sounds like a lot of chapters but most of them are short and they contain many examples and short practice programs that lead you through the system one idea at a time. Chapter 18 (Putting Your Program Together) provides a summary and checklist of what you need to do as you write your graphics program.

You may want to refer to Chapter 18 (the summary chapter) as you work; you will probably go through the other chapters in Parts One, Two, and Three only once. Use them again if you need to train a new programmer on the system. The rest of this guide is reference material in which you look up specifics from time to time as you program.

If you find that you want a more detailed basic description of the Graphical Kernel System (GKS) than this guide provides, the books (listed in the bibliography at the end of this chapter) may be helpful.

DESIGNING INSTRUCTION 61

PATH B

B. This path is for you if you have programmed in FORTRAN and you have some experience with computer graphics, but you are not knowledgeable about the Graphics Kernel System (GKS).

IN A HURRY?

Chapter 5 (Graphical Output) contains models and examples that you could modify if you have to generate some simple graphics right away and just don't have time to learn the system step-by-step. However, there are some complex concepts, and anytime you blindly follow a model without really understanding what's going on, there are many possibilities for errors. For this reason, it is a good idea for you to *work through the examples* before you actually tackle a task.

THE RECOMMENDED PATH:

Skim Chapter 3 (An Introduction to Graphics) lightly; it may be review material for you.

Then go on to a careful reading of Chapter 4 (An Introduction to Graphical Kernel System) which supplies standard definitions for GKS.

After you have read these introductory chapters, work through Chapters 5 through 17. That sounds like a lot of chapters but most of them are short and you can do the examples and practice programs quickly. Chapter 18 (Putting Your Program To-

gether) provides a summary and checklist of what you need to perform as you write your graphics program.

You may want to refer to Chapter 18 (the summary chapter) as you work; you will probably go through the other chapters in Parts One, Two, and Three only once. Use them again if you need to train a new programmer on the system. The rest of this guide is reference material in which you look up specifics from time to time as you program.

If you find that you want a more detailed basic description of the Graphical Kernel System (GKS) than this guide provides, the books (listed in the bibliography at the end of this chapter) may be helpful.

PATH C

C. This path is for you if you know FORTRAN and GKS and only need information about the specific implementation of the system that is NEWGRAF.

IN A HURRY?

If you want to skip the introductory and tutorial material, begin with Chapter 18 (Putting Your Program Together—A Summary). Then look at the charts that begin Part Four (the gray pages). These charts will help you go directly to the material in Part Four that you need. Part Four gives the specific details and descriptions of each of the subroutines in GKS.

DESIGNING INSTRUCTION 63

THE RECOMMENDED PATH:

Work through the examples and model programs in Part Three so that you become familiar with exactly how NEWGRAF works. After you have been through chapters 5 though 17 once (most of them are short and you can go through them fairly fast), you will probably only use that material again if you need to train a new programmer.

Part Four contains reference listings; the guide that begins Part Four will help you go directly to the particular function you need.

Skim the appendices so that you know where that reference material is when you need it.

If you are interested in the history and complete technical details of GKS, refer to the ANSI and ISO documents which give the international standard for GKS. They are listed in the bibliography at the end of this chapter.

MULTI-MEDIA APPROACHES

Are printed manuals dinosaurs on their way to becoming fossils? Will all software instruction be self-contained in the program and accessed by pressing a HELP key? Is a book an obsolete way to teach a system in this high-tech world? Well, actually, no.

The printed page has a number of advantages that are not apt to disappear. The first is that a page of black print on white paper is much easier to read than

the screen of a monitor, even a large high resolution monitor in amber or green. Why? The contrast is easier on the eyes; you are in charge of how far and at what angle the print is from your eyes; you can scan a larger page than most monitors can show.

The second advantage of print is that you, the reader, have much greater control over what text you can see than you do with a computer. Your eyes can travel to the top of a page, and down again to a footnote, with much less physical effort and in much less time than you can scroll a screen up and down again. You can turn back one page, or go forward and then return, with great ease. You can flip a page back and forth and compare two pictures.

The computer screen is a great medium for interaction; it's fun to process words, select items from a menu, move a cursor, click a mouse. But it's boring to read 20 or more lines of text and then push one button to see the next page. Reading is essentially passive and most of us would rather lean back, put our feet up, and stretch as we read, rather than be tied to a computer screen.

The third advantage of the printed page is that you can look at it and at the screen at virtually the same time. If information *about* the screen is in another part of the program you must get rid of the screen you needed help *for* in order to read the helpful screen. A split screen alleviates this to a certain extent, but most help programs don't use that capability extensively.

The printed page can be marked, annotated, corrected, and highlighted for emphasis. It is easy to copy, easy to transport, and easy to show to someone else. You can, by means of a printed manual, experience a software program (to some extent) without having access to a computer. Manuals are written in a language widely compatible and completely device-independent. Finally, the printed page is less threatening for novice users than use of the computer screen for instructions.

DESIGNING INSTRUCTION 65

Explanatory screens, contained within the program and called up by pressing a help key, can be very helpful. Slide-tape shows, video tapes, films, and instructional programs on disks for the computer will undoubtedly be used more and more as substitutes for people-intensive classroom training. These multi-media approaches usually cost more than printed materials and the equipment to show them is also expensive. In addition, visual images become dated faster than printed information (clothes go out of fashion, hair styles change) and are more expensive and time-consuming to revise.

Computers shine at interactive instruction. Programs that require frequent responses keep the learner awake and interested. People like to use programs that take input from the learner and change what happens on the screen in response to that input. You choose a color, or a size, or a point of view, and a dazzling graphic is displayed on the screen. The printed page can't compete with such power.

In short, I advocate using computers to do what computers do best (interaction, brief instant help, color graphics, branching in response to choices, drill in numerous versions of the same question), and letting print do what print does best.

Print can also take on a variety of forms in partnership with computer instruction. A printed reference card with the most frequently used commands is enormously helpful. Labels to stick to some of the keys on the keyboard can make learning much less painful. Short video tapes, written exercises, lectures, practice sessions at the computer with the manual open beside the machine—all of these can make a three-day training session exciting and effective if used together.

Even high technology provides no magic answers to the problems inherent in learning new skills and understandings. High technology does provide dynamic ways to enhance the traditional methods of instruction.

CHAPTER SEVEN

PLANNING A MANUAL

Your sixth-grade teacher was right. The best way to write something is to begin with an outline. For technical manuals, however, begin with the table of contents. You will revise the T of C, as it is fondly known, many times over, but it is the place to start, and to end. As one of the last cleanup chores when the whole document is written, you check each page number in the table of contents for accuracy.

TOP-DOWN APPROACH: IDENTIFY YOUR AUDIENCE

Top-down approach means that you visualize the end before you even begin to think about the beginning. Think of the consumers with copies of your manual beside their computers, trying to make sense of the software programs they just bought.

My grandmother used to say that there were only three important things to remember about buying a house: 1. Location, 2. Location, and 3. Location. In the same spirit, I am convinced that there are only three important things to consider

PLANNING A MANUAL 68

as you plan a manual: 1. Audience, 2. Audience, and 3. Audience. Don't just talk with the programmer to find out the intended audience; interview key people in the marketing department; develop a questionnaire. You can't make a bull's-eye if you don't know the target.

The following questionnaire was developed as a way to identify the audience for an inventory accounting system. All the people concerned with the development of the system, as well as a number of people in the marketing department, were asked to visualize the potential customer for the system. This was done so that the documenter could write the instructions at the most appropriate level of detail. The underlying questions were these: does the manual need to teach about computers from the beginning, and does the manual need to teach the fundamentals of inventory systems?

Many of these specific questions will not apply to other kinds of software, but this sample may be a useful model as you set about characterizing your audience.

QUESTIONNAIRE

WHO IS THE CUSTOMER?

1. **Does the customer already own a computer with some system on it that is in use—inventory, word processing, accounting? In other words, is the customer familiar with doing paperwork on a computer?**

2. **Is the customer someone who has just bought a first business computer, and is this inventory system the reason for buying the computer?**

3. **Is this a person who is familiar with word processing and who has a familiarity**

with the use of the cursor and other controls, so that their use is second nature?

4. Is the customer going to use a terminal with this system on it at the *point of sale* for the business?

5. Is the customer going to use a terminal with the system on it in the *office* where the bookkeeping is done?

6. Does the customer already have a computerized bookkeeping system?

7. Does the customer already have our financial accounting system?

8. Does the customer already have (or is about to get) our payroll system?

9. Does the customer have a large warehouse dedicated to storing the inventory?

10. Does the customer have more than one retail outlet for the inventory?

11. Is the business primarily wholesale rather than retail?

12. Does the customer now have a clear and effective paper system for handling inventory?

13. Does the customer now have an ineffective, disorganized, unsystematized approach to inventory control?

14. Does the customer now have a systematic approach to inventory but needs the power and speed that a computer system can bring?

15. Will the person who buys the system be the person who makes the daily entries into the system?

16. Will the customer want to spend a lot of time training one person on the system?

17. Does the buyer expect the person who learns the system to remain in that position with the company for a couple of years?

18. Is it necessary for the system to be fairly easy for the entry clerk to learn?

19. Is every entry clerk who uses the system going to be familiar with large, well-organized, technical inventory systems?

20. Is the person who actually uses the system on a daily basis going to be familiar with all of the technical terms used in an inventory system?

21. Is the person who does the daily entries into the system apt to be a trainee in inventory?

22. Is the buyer going to take on all responsibility for training and bringing someone who uses the system up to date on inventory systems, or does that responsibility belong to the manual and to the system itself?

23. Is the person who uses the system someone who thinks and acts easily and quickly?

24. Is the person using the system going to be someone whose primary interest is speed of access rather than speed of entry?

PLANNING A MANUAL 71

AIDS FOR YOUR AUDIENCE

You bring a precious innocence to the program when you first approach it; never again will you be able to see it as the beginner sees it. Hold on to that point of view as long as you can.

Don't begin to write the manual with chapter one, then two, and so forth. You, in your role as consumer, have just opened the book. What do you want to see? If you're a beginner, you might like to see a few comforting words about the structure of the manual perhaps, or a guide to making your way through it. If you're an expert, you want to know how to get to the good stuff fast.

PREFACE

The preface should help everybody get started. No words should need to be explained. Remember, the reader doesn't know any of those technical terms yet.

GLOSSARY

The next part of the book that I think of is the glossary, which is found way at the back but is an essential part of a new user's security blanket. An extensive glossary is the hallmark of a good manual. You will probably write the glossary towards the end of the process, but you should start planning and collecting material for it from the start.

To write a good glossary, copy every definition you can find (or extract from experts) for all the important words. Then *rewrite* those definitions, leaving out lots of technical detail and rephrasing the term in plain and simple English. If you have to use one technical piece of vocabulary to define another, include a cross-reference to another word in the glossary.

There will almost undoubtedly be some pressure on you to tell all—to make

every definition totally complete and correct. A statement that is complete and correct may well fail to communicate. Communication requires that you simplify, leave out, and introduce ideas one at a time.

This is a key difference between scientific language and other forms of writing: in order to be understood you must simplify; in order to simplify you must be inaccurate. That moderate degree of temporary inaccuracy is deliberate and necessary, but a true scientist will, quite rightly, be irritated by it. Scientists talking to scientists, engineers writing for engineers, speak another tongue altogether and their manuals are written by a different set of rules.

What you say for the end-user must always be *correct*; it must sometimes not be *complete*. It is in the glossary that this principle shows up most clearly. Writing a good glossary takes lots of time. You should polish and re-polish each sentence, then submit it to some good technical reviewers for accuracy. Correct the facts but retain your simple style.

REPETITION

One good way to structure a manual is based on spiral learning. You talk about a given topic again and again, but each time you go a little deeper into it. One application of this principle is in the way you teach the vocabulary of the system. The first time you introduce a term or an abbreviation, put the non-technical words first and then the technical term in parentheses. The second time, reverse the order. The third time you can drop the explanation.

FIRST: Random access memory (RAM) is important because. . .

SECOND: RAM (random access memory) functions in this way. . .

PLANNING A MANUAL 73

THIRD: Verify that the RAM is adequate for. . .

The method just illustrated, however, works only if you have a reasonable expectation that the reader will go through the chapter in sequence, without skipping. People do *not* usually read manuals sequentially. Novels must be read straight through, but manuals almost never are. People skip around; they skim the material; they use the manual in the same way they would an atlas or a dictionary.

Repetition of ideas, definitions, and information is, therefore, essential to an effective manual. If you say something three times, in three different places, in three different ways, it *may* just get through to the reader.

INTERACTION

Another important principle to bear in mind as you plan the manual is that *action* is the most effective teaching tool there is. Make an active participant of your reader as soon as you can. Explain a little; give the reader an action to take (usually at the keyboard of the computer); show the expected result; ask the reader to compare what happened with what was expected; show the reader how to correct any discrepancies and try again.

Writing a manual is essentially the act of *teaching*. Familiarize yourself with the principles of effective instruction, and make them the basis of your planning. In designing an instructional sequence, as well as in designing a sentence or a page, you should have a reason for everything you do. If you can't *justify* a choice that you have made, rethink it. If you don't know why you are doing it that way, the reader surely won't either.

Tom Shea, in an article in *Infoworld*, Volume 4, Number 34 (August 30, 1982) quotes one software professional as saying that existing documentation misses

PLANNING A MANUAL 74

the mark in three respects: simplicity, organization, and interest. In the same issue, Michael Swaine establishes these criteria: completeness, clarity, organization, correctness, and style. As he puts it, "Are there indications that it was written by a human being for human beings?"

Many manuals have two divisions, the tutorial at the front and the technical details at the back. Sometimes these are separated into two different volumes. The sample forms used in this guide mention a Startup Manual and a Reference Manual.

The outline that follows is a general one adapted from some business accounting software. Any documentation department should develop an outline of this sort so that all the manuals from the company will have a similar look and structure.

PLANNING A MANUAL 75

OUTLINE

MANUAL ORGANIZATION

The major company software systems are documented in two manuals:

1. Startup Manual
2. Reference Manual

Both the Startup Manual and the Reference Manual have an untabbed section called *Front Matter* before the first chapter.
The Front Matter consists of the following items:

1. Title page. The title page is actually page I, but has no number. Its back (completely blank) counts as page II but is not numbered.
2. Disclaimer page. The disclaimer page is numbered III. The Document number is at the lower right of the disclaimer page.
3. Credits page. The credits page is numbered IV. The first time a manual is printed for sale or sent to distributors (more than five), the author of the manual confers with the programmer and designs the credits page.
4. "Keeping Up With Changes" is page V.
5. "Using This Manual" is page VI.

PLANNING A MANUAL 76

The Table of Contents begins on page VII and is subsequently numbered with Roman numerals.
Tabbed or titled chapters follow Front Matter. Every chapter begins on a right-hand page.

The *Startup Manual* consists of these tabbed chapters:

Introduction

Overview

Configuration

How To Use The System

Reports

One copy each of every *major* report in most (but not necessarily all) of its variations is included in the Reports section. The reports are arranged in order by Main Program Menu option numbers and in menu order within a chapter. *This point is critical*: enter *only* "How To" data to do these reports. Otherwise the user sees data that may be contradictory or inconsistent.
The *Reference Manual* consists of these chapters:

Numbered chapters, one chapter for each option on the system's Main Program Menu.

PLANNING A MANUAL 77

Appendices

Appendix A - Helpful Hints
Appendix B - Problems — Causes — Solutions (the last page is the Problem Report Form and is unnumbered)
Appendix C - Glossary

The *Back Matter* Consists of the following items:

1. Indexes

   Forms index
   General index
   Menu index (titles listed according to the order of their occurrence in the system)
   Reports index
   Worksheet index

2. Forms

PLANNING A MANUAL 78

CHECKLIST

These brief listings summarize the essential qualities of excellent documentation. Check your work against these standards or use them to evaluate documentation that you are thinking about buying.

CHECKLIST FOR QUALITY

Planning

- Hire people who can write—train them in technical aspects
- Include writer from beginning as part of development
- Keep writer informed of changes in program
- Logical, large scale organizing plan for manual

Writing

- Simple language
- Correct grammar, punctuation, language usage
- Predigest the material for the reader
- Preface or introduction that tells how to use the manual
- Avoid jargon and abstract words
- Present tense
- Active voice
- Avoid capital letters
- "Who does what when" approach
- Relevant sample problems
- Graphics
- Reference by chapter, not page number

PLANNING A MANUAL 79

- Control information (date, version number, etc.)
- List of tables, worksheets, etc.
- Table of Contents
- Overview
- Tabs
- Headers—brief and at several levels
- Chapter table of contents
- Paginate by chapter
- Glossary
- Index
- Sheet at back for reader suggestions

Testing and Review

- Review by people with these four perspectives:
  - Technical
  - User
  - Management
  - Editorial
- Rewrite for clarity
- Field test and revise with typical audience
- Manual and system match—all facts correct

Packaging and Appearance

- Legible text
  - Typeface with serifs
  - Arabic numerals
  - Paragraph indentation

PLANNING A MANUAL 80

Space—not too much information on page
Size—manageable, not too large
Attractive
Functional
Durable

LASHTON·TATE

81

CHAPTER EIGHT

ESTABLISHING FORMATS

Technical writing always involves categorization, or teaching the user which items belong together. Formatting, the arrangement of the text on the page, is a valuable tool for showing the reader what elements of the system are grouped with each other.

Learning research demonstrates that people remember better when key words are introduced in advance of the material which follows. The question must exist before there is a place to put the answer. This is the reason that the manual needs a preface, and each chapter needs an introductory paragraph to raise the question that the documentation is about to answer. These overt statements of what is about to be said are called "advance organizers" because they enable the reader to organize a place, in advance, for the information. It's as if you were saying, "Clear a place on your mental desk; I'm about to give you an important memo."

ESTABLISHING FORMATS 82

HEADERS

Headers, or headings, are the advance organizers within a chapter. Be generous with your headers. Not only do they tell what is coming, they make it easy for the reader to skim the material or to find a certain paragraph.

Headers, by their placement, can also convey information about which text is subordinate or "what comes under what." For example, if the user is to select accounts payable or receivable, and then to specify an account number within the accounts payable, you might assign a level two header to your discussion of accounts payable, and a level three header to your explanation of account numbers.

In this way, the reader comes to associate a certain spacing with a specific kind of information. This learning is subliminal; the reader remains unaware of the message but receives it nonetheless. Another reason to be consistent with the use of formatting is to simplify typesetting. If the manual is going to be typeset (instead of typed or word processed), codes will be added to your text to indicate format. Your level three headers, for example, may be coded to appear in a larger type size than your level four headers. If you have been meticulously consistent, this coding is much easier and takes much less time and money.

SPACING

White space around text is extremely important in making the manual easy to read—a crowded page is hard to read and alienates the reader. Surround a warning with space to make it more visible.

Technical manuals seem to be inherently dull. Use every device you can to fight this tendency. One small, subtle way is to vary the appearance of the page

with the line spacing. Be consistent with spacing, but only within a certain type of text. When you change topics, as indicated by a header, you can change the spacing by putting three spaces before the header, for instance.

"Double space" is a somewhat ambiguous term. Some people will interpret it to mean "hit the space bar twice." Others will interpret it to mean "put two blank lines between the lines of text." There is an unambiguous way to specify how much space you want between lines of text. A *clear line* is the amount of space that a line of text might occupy. Ordinary double-spaced typing has one clear line between the lines of text. Ordinary single-spaced typing has no clear lines betweeen the text. Triple-spaced typing has two clear lines between lines of text. Once you get used to thinking in these terms, you can communicate rapidly and clearly about the spacing of your text.

The next section of this chapter contains some definitions of levels of headers in terms of clear lines.

CONVENTIONS

How do you achieve consistency from page to page, chapter to chapter, and manual to manual? How can you and other writers on a documentation team write manuals that are consistent with each other?

When I am writing alone on a single manual, I begin each chapter with formatting information. This information is entered on my disk (in *WordStar* with .ig for ignore) in such a way that it only shows on the screen, not on the printed page. For this chapter, my opening lines look like this:

ESTABLISHING FORMATS 84

.ig ESTFMT8
.ig Lucia McKay
.ig file last opened (DATE)
.ig Chapter 8 of *Soft Words, Hard Words*
.ig margins at 1 and 70; chapter titles all caps, bolded, centered
.ig on line 1; text begins on line 6; no paragraph indentations;
.ig one clear line between paragraphs
.ig Wordstar set with no hyphen help and no justification, with
.ig a top page margin of 5 and page offset of 10
.ig Three clear lines before a side header (initial cap on first word
.ig only) and 2 after
.ig command below puts in the footer
.fo Eight-#

CHAPTER EIGHT
ESTABLISHING FORMATS

This information describes how this manuscript looked when I sent it to the publisher. As it has since been typeset, the page you are looking at now does not exactly match those word processing specifications.

When I was ready to begin chapter nine, I copied these lines into chapter nine as my first move. Then I substituted the necessary information—typing 9 where 8 appears, putting in the new title, etc. Every time I open the chapter, I change the DATE. This tells me which version is the latest if I get two versions confused.

Since I designed the format in the first place, you might think I could remember it from chapter to chapter. I have found that I can't. This is especially true if I am working on two manuscripts or after I take a break of several days. I like to

free myself from having to remember margins, tabs, and other spacing. When I am working on an extremely complex or technical chapter with lots of charts and strange tabs, I print the format information so I can see it as I write. *WordStar* provides two ways to do this—either by selecting the "suppress page formatting" option when printing or inserting a space before the .ig command (which is how I made the invisible lines appear in this text).

I operate, whether writing alone or as part of a documentation team, on a "drop dead" philosophy. This means that if I dropped dead today, some other writer could pick up what I'm working on and figure out what I was doing and carry on. I've not dropped dead yet, but I have been grateful for this way of doing things. I find it especially helpful when I put aside a project for a period of time, and then go back and pick it up, perhaps for revisions.

In a documentation department, specifying your conventions becomes even more important. If it becomes necessary to put several writers on one manual in order to meet a rush deadline, they can work together without confusion or wasted effort if all of them write by the same conventions. This makes a departmental style manual essential.

The style manual also explains to others outside the department (programmers, publicity people, and marketing people, for instance) what you do and why you do it. The manual is invaluable for training new writers. If you are interviewing candidates for a writing position, give them your style manual to read. It effectively conveys the scope and flavor of the task.

The following examples of conventions for headers is taken from such a style manual. It shows one possible arrangement for hierarchical headers.

ESTABLISHING FORMATS 86

STYLE MANUAL

HEADERS

Each header level is subordinate to the one above it.

LEVEL ONE

Four clear lines above and three below. Bolded. All caps. Used *only* for the titles of tabbed chapters.

LEVEL TWO

Same as Level One, but not bolded. For use in titles of worksheets and between charts of problems (usually one for each chapter) in Problems—Causes—Solutions. May also be used for stand-alone sections such as DOES THIS SYSTEM MATCH

ESTABLISHING FORMATS 87

YOUR NEEDS? Listed in Table of Contents for manual and chapter.

Level Three

Three clear lines above, three below. Initial caps. Used for major divisions within the chapter. Listed in Table of Contents for manual and chapter.

Level Four

Three clear lines above, two below. Initial caps. Listed in manual Table of Contents on case-by-case basis. Listed in Table of Contents for chapter.

Level Five Two clear lines above, followed by text. Initial caps. Underlined, no period after header. Listed in chapter Table of Contents on case-by-case basis.

Use normal paragraphs thereafter. If an asterisk (instead of text) follows a level five side header, there is one clear line between it and the header.

*Actions the reader is to take are indicated by an indented asterisk.

ESTABLISHING FORMATS 88

Level six. Two clear lines above, followed directly by text. Bolded, initial caps on first word only, followed by a period.

The next header is not really hierarchical. It is used chiefly in Configuration and How To. As in the following example, it always begins with a number.

1. Numbered Side Headers

Three clear lines above, two below. Text following in block style. Numeral (not underlined) at left margin, followed by a period, two spaces, then header (underlined) in caps and lower case.

NOTE: When you are describing items on a data entry form, use the header spacing conventions as they appear in the following example:

ACCOUNTS RECEIVABLE CURRENT PAYMENTS

This line shows the customer's current payments in this period. The system fills in this line.

Headers are used in hierarchical order to show what comes *under* what and what is *parallel* to what. You may, however, skip a level. It is extremely important to be consistent with headers.

Don't try to narrate the entire contents of the section in the header. Headers are not there to tell a story! Pick three or four key words to identify the material. No header should be more than half a line long. Use parallel construction in headers when possible, but don't wrench the meaning out of shape just to get the grammatical construction in exactly parallel form.

FOOTERS

The reader must be able to find any section or page of the manual quickly and easily. Tabs help make this possible. Another way to help identify the pages is the use of footers. A footer is text that is associated with the page number at the bottom of the page.

Footers in technical manuals should contain at least the chapter title and number. If you keep the footer centered, instead of alternating right and left, you make life easier for yourself. While most word processing programs provide for the automatic alternation of footers (odd pages, footer at the right; even pages, footer at the left) this makes just one more thing you have to check on every page before you go to press.

The top and bottom of the pages should be free of decoration. An over-zealous company lawyer may want you to include some kind of copyright statement on every page. This clutters up the manual dreadfully and annoys the reader. Resist it if you can.

My convention is to number the blank pages with footers except when they are the last page in a chapter. The last page of a chapter, if it is a right-hand (odd numbered) page must have a blank sheet after it for a manual printed on two sides of the paper. This makes every chapter begin on a right-hand page.

Many authors feel obliged to put something on those blank pages. "This page

intentionally left blank" is a favorite. Every reader I've asked finds that statement stupid, annoying, or funny. I have used "This page left blank for notes" but I think that's unnecessary too. I have become convinced that blank pages should simply be blank.

A GOOD WORKING FORMAT

Scientific and technical papers often use the convention of numbering the paragraphs or pages with decimal numbers in this style: 7.23.4 This is user unfriendly. It was originally done to make inserting material easy and to enable the writer to refer to any paragraph by number. It is not an appropriate style for manuals that are to be used by the general public. Numbers are not perceived as friendly; decimal numbers are less friendly than integers. For these same reasons, avoid Roman numerals (i, iv, xix) except perhaps in the front matter (anything that comes before chapter one).

It is absolutely certain, right up there with death and taxes, that you will have to make additions to some pages. You may have to add as much as a paragraph, although reviewers and editors don't generally request much longer page additions.

Changing the place where each page ends is inconvenient and time consuming. Presumably you have planned that page ending so that it doesn't break up a table or chart and so that any graphic material appears with its explanation on the same page. You have also made forms and worksheets begin at the top of the page. To mess up all that careful arrangement because someone tells you to add a sentence can reduce the strongest writer to tears.

Write your first draft with short pages. No reader is going to notice or object to a page that ends six lines before it has to. If you leave five or six lines blank at the

end of every page, you have lots of room to make changes in response to reviews. Form the habit of stopping short. I can promise that you will be glad you did. Though this way of doing things doesn't apply if you are writing page after page of prose, manuals have very few such pages. Instructions, screens, tables, charts, and examples break up almost every page.

Another convention that makes your rewriting much easier is to number the pages chapter by chapter. This means that each chapter begins again with page one. You can change any chapter without having to reprint the whole manual. For ease and speed in searching, saving, and printing the chapters, always keep them under forty pages, and under thirty if possible.

A reader should not have to turn from page 38 to page 15 and back to page 34 to find a particular piece of information. There will be times, however, when you have to refer the reader to another part of the manual. Do not use page numbers to do this. Page numbers will change and then all those references will be incorrect. Refer to material by the chapter or section rather than by the page.

If you must use a specific page reference, or if you want to refer to a part of the manual you haven't written yet, you may want to use the BLAH convention. I say "see chapter BLAH" or "this item has BLAH blanks in it." Then, before each chapter is printed in its final version, I do a search for BLAH and replace this temporary flag with the correct information.

MAPS TO THE MANUAL

The most frequent use made of the manual is for reference. People want to be able to look up specific pieces of information. They want to be able to find what they are looking for quickly and without having to turn to several different pages.

ESTABLISHING FORMATS 92

When a reader first picks up the manual, the table of contents is the most important map. It provides an eagle's eye view to tell the reader what is discussed and how the information is arranged. The individual chapter table of contents do the same thing for each chapter. Headers and footers also act as signposts along the way.

The most important map to the manual is the index. Though every manual needs a comprehensive index, it cannot be completed until the last minute when the page endings are fixed. Since manuals are always done in a hurry, the index is often neglected. A good index has several levels and lots of cross-references. For a 400-page manual, the index should be several pages long.

I have found that a professional indexer is well worth the money charged. Professionals use indexing programs that perform accurate searches for occurrences of a word, and they can turn out a good index in far less time than it takes to do it without a program. I suggest that you consider finding an indexer whose computer is compatible with yours early in the manual-planning process.

No matter who does the indexing, the final pages should be carefully checked. Incorrect page references spoil the credibility of the manual and make the reader angry. I have verified indexes by spot checking (every ten entries or so) and I have also organized a team to spend a half day checking every single reference. If the spot check turns up more than about two errors, then the whole index is suspect and may need to be redone. Remember that revisions of format or content require corresponding changes in the index.

93

ASHTON·TATE

CHAPTER NINE

EDITING, PROOFING, AND REVIEW

Two pairs of eyes are *always* better than one. If you and another writer are of equal ability, exchanging your work for editing results in better text than either of you can achieve alone. Every text needs a second reading. You can perform this second reading for your own work *if* enough time has gone by since you wrote it so that you can read it with fresh eyes. Most of us don't have the luxury of waiting a week or two to go over our own work, so we perform this function for each other.

WRITER'S BLOCK

I am indebted to Dr. R. John Brockmann, who gives a seminar, "Writing Better Computer Software Documentation," for the most useful idea I've ever heard to prevent writer's block, or being unable to write.

Dr. Brockmann points out that each of us, when writing, is wearing two hats—one as writer or creator, and the other as editor or judge. The judge within us can absolutely block the creator. When you sit down to write, turn off your editing

function. You can, and will, perform those tasks at a later time. Write without judging; give yourself permission to be less than perfect for the first draft.

This decision to act only as writer still leaves you free to correct as you go and to make changes that suggest themselves immediately and easily—but without agonizing over "is that exactly right?" Correct any typing or spelling errors that you see as you go along; don't worry about the ones you don't see. If it is easy to reach for the dictionary or reference book, or to pick up the phone and ask the programmer a simple question of fact, do so as you write.

Mark for later verification any facts about which you have the slightest doubt. Exclude mental questions about the quality or correctness of what you are doing; those are the fears that block the flowing production of prose. Assure yourself that you will have another chance to improve the phrasing and order of the explanations.

Sometimes in the course of writing I have a sudden insight about the relationship of the ideas I am teaching. That's the time to stop writing, and restructure as needed. When the organization comes clear to you, capture that conception as it occurs.

Writers often find it difficult to receive the comments of editors without being defensive. There are some principles that may help. Establish, within a documentation department, the understanding that no one's work is beyond editing. The amount of editing and the need for it have nothing to do with the place of the writer in the office hierarchy. Editing is help, not criticism, and everyone benefits from it.

As a writer, I tend to accept as extremely important any correction about technical matters. I make the change if at all possible. I also, however, cross check any fact about which I have doubts. If several programmers are working together on the system, they may not all agree about certain technical matters. All of them

consider themselves definitive experts, and I have had to mention gently, on occasion, that I was getting contradictory answers to my question. Usually that gets the programmers together to work out a consensus.

I do not take very seriously, however, the editorial marks the technical experts make on the subject of language and grammar. I check to make sure that I know what I'm doing, and why, and then I often quietly ignore the marks. Above all, I resist pressure to write in a complex or obscure style.

Whenever I rewrite a technical description to make it more straightforward, I ask the original author to re-read it to make sure that I haven't introduced inaccuracies in the simplification process. The less I understand about the technical content, the more apt I am to write material that is incorrect in either concept or detail. A close working relationship with the technical content expert is therefore essential, especially in the beginning.

PROCEDURES FOR REVIEW

Every manual needs three kinds of review. First, the manual needs a careful technical review by one or more experts. Second, the manual needs an editorial review for consistency, correctness, and style. Third, the marketing department needs to review the manual, especially the introductory material, for tone and approach.

The manual should also be reviewed by one or more people who can fairly represent the intended buyer. Since user testing can only be done after the manual is essentially complete, this step often gets omitted in the rush to market. At that point, there is enormous pressure to print and sell it.

Bear in mind that each review must be followed by a period of revision in which you incorporate the review results. If this is not done, the review time is wasted.

EDITING PROOFING, AND REVIEW 96

Appendix B contains some example review forms. The purpose of these forms is to tell the reviewer what you need and to spell out the viewpoint you want that particular reviewer to take. Forms also make it easier for the reviewer to give you feedback.

Discourage verbal feedback from your reviewers. It causes problems for several reasons. First, it takes too long. The reviewer tends to go on at greater length than is necessary. Second, it increases the chances for ego involvement and defensiveness. Third, it's hard to remember the comments in detail when you actually start rewriting.

Ask your reviewers to mark on the draft copy with contrasting ink such as red or some other color that stands out from the printed text. If you can persuade them to learn the basic proofreading marks (see Appendix A), that is a real help. In any case, ask them not just to circle words, but to write notes that spell out the problem. Most importantly, encourage them to write their version. It's easy to say "this is wrong;" it's not so easy to suggest a better alternative. Try to elicit specific alternatives.

Be specific about your expectations. If you don't want them to even look at certain aspects of the manual, make that clear. If you are depending upon them to catch certain kinds of errors, spell that out. You can also tell them how closely you expect them to mark the text. If you want numerous marks on every page, that is clearly going to take more careful reading and more time than a "once over lightly" for specific errors.

For final reviews, where you expect only a few marks, you may want to ask the reader to paperclip the marked pages so you can turn to them at once. Within a documentation department, you will almost certainly want to clip pages that need correction or discussion. In one such department I directed, the following explanation appeared in the style manual (the author remained anonymous).

EDITING PROOFING, AND REVIEW 97

LUCIA'S CLIP CONVENTION

Applicability of:

On a single-sided page, the clip convention does not apply. You may have your way with the clip. On a double-sided page, Lucia's clip convention applies. Period.

Nature of:

The clip is slipped onto the sheet so that the inner tongue is resting upon the page on which the correction resides. (Be warned: this is not how God intended these clips to work. This point is irrelevant.) See exhibit **A** that follows. If there are corrections on both sides of the sheet (that is, both pages), it's two clips, folks.

History of:

Long ago, in a galaxy far, far away, Lucia encountered a plastic clip whose inner tongue was shaped like an arrow. There was only one in the whole universe, and *she* found it! See exhibit **B** that follows. Ever after, she believed that the inner tongue of every other clip was, in its heart of hearts, an arrow, and therefore should "point," as it were, to the correction.

EDITING PROOFING, AND REVIEW 98

A.

B.

Whether or not you wish to subscribe to this myth, the point is this: Whenever a number of writers are working together, they need to design consistent methods to forestall such questions as "Which side of this sheet of paper did you want me to look at when you clipped it?" The methods that you evolve are then recorded in your style manual.

Ideally, you should return a marked copy to the reviewer with each mark coded to show whether or not it was incorporated into the final text, and if it was not, why not. In practice, this takes too much time. If you do take the time to do it, you will discover that most reviewers don't want to wade through all that feedback anyway. If you are doing this to protect yourself, then you are in an adversarial relationship, and even this careful feedback probably won't help.

For my own information, I put a check mark (in a color such as green) by each correction or editorial comment as soon as I have taken care of the matter. If I choose to make *no* change, in spite of the comment, I may write "stet" (which is Latin for "let it stand") or put three periods (...) under the word in question. The

three dots under a word is a way to signal that no change is to be made. In highly controversial cases I may write the page number from *Words Into Type* that supports my decision.

The point is to keep track of what you have done, and what you have yet to do. The method doesn't matter; what matters is that you have a method.

The following list is an example of procedures actually used in a documentation department. It illustrates the kind of decisions that need to be made, agreed upon, and written down so that everyone can follow the same procedures.

PROCEDURES

If it has a clip on it, it has not been proofed. After proofing, remove clips and put originals in archives. PROOF *everything* as you go. Preferably, proofing should be done by someone other than the author or word processor.

Update both the hard disk and all relevant floppies at the end of *each* session.

Keep a written log of all files that you change, *as* you change them, and, at the end of *each* day, make backups of these. This is especially important if you work on hard disks.

Take your standard sections from the *updated* version of your model. Insert any update pages in the appropriate manuals immediately.

You are responsible for following the style manual *exactly and in detail* on every point. It is much easier to do it right the first time.

EDITING PROOFING, AND REVIEW 100

Please hand the production people or an editor either:

1. a specific global (applies to all pages) to look for and change, or

2. work *you* think has no further errors.

They will, undoubtedly, find errors but the point is to do everything you can before you pass it on to the next person.

We all work on each other's stuff, so we must leave a clear, unambiguous paper trail of what we've done. Label every disk with a *completely* filled-out label.

In general, copy and edit instead of retyping. Retyping may be faster, but it risks the introduction of new errors.

CHAPTER TEN

THE PRODUCTION PROCESS

Your production process depends on a number of factors. The first is the facilities you have for producing an original draft. In this book I have assumed the writer is using a word processing program on a computer (or a dedicated word processing machine). I don't know anyone who has learned a word processing program who has then reverted to a typewriter, except to address the occasional envelope. Word processing improves the *quality* of writing because the physical procedure for corrections, additions, and printing is so much easier than retyping. This, in turn, encourages you to rephrase as you write, to select a more exact word, and to fine-tune the sequence and organization.

There are many word processing programs available. Choose yours with care. Changing programs wastes a lot of time because you must re-set all your automatic movements. If you are in a hurry (and writers of manuals are always in a hurry), it is worth asking a company to buy the program you are familiar with rather than trying to change.

The program you choose for yourself should be one in common use so that printers in offices in other cities can read your codes. Choose a powerful pro-

gram that provides lots of options for designing your page. Look particularly at the ability to deal with columns.

A machine or program that is best for a professional word processor or typist may not be the best for a writer. Writing is much slower than typing. A writer revises in the process of typing in words. A writer is also constantly thinking about content and correct word choice. A typist doesn't concentrate on these things. A typist wants to be able to fly through page after page, while a writer seldom needs to do that. A writer needs the capability to make changes.

Whether you want to save the text by pressing one function key or by pressing the control key and one or two other keys on the keyboard (codes) is a matter of personal preference. I like function keys because I'm not good at memorizing codes. I like the function keys to be labeled in English with simple mnemonic abbreviations or English words.

WordStar is the most commonly used program at this time, and it has many powerful options. I wrote this book with the IBM version of *WordStar* so I could select and name ten function keys. The names of these keys stays in an inconspicuous line at the bottom of my screen. I chose "FINDTX," for instance, to name the key labeled F1. This key enables me to find a certain word (which I specify each time) anywhere in the text. Choosing a word processing program, however, is like choosing your car; people don't agree on a single choice, and we all swear that whatever we chose is the best!

Peter McWilliams wittily tells you everything you need to know on this topic in *The Word Processing Book* (listed in Appendix D). In addition, computer magazines (see Appendix D) frequently print articles reviewing current programs with tables of comparative features.

Suppose you have a word processing program running on a computer. Now

you need a printer to print out drafts. Dot matrix printers are fast, inexpensive, and easy to use. Their printed pages are fine for drafts and review copies but not really good for the master copy from which you want to reproduce from 50 to 5,000 or more manuals. The technology of printers is advancing as rapidly as everything else in the field, but at the time of this writing, the daisy wheel printer is the one most commonly used to print masters. Laser printers are wonderful if you have access to one; they are still too high-priced to be very common. You might ask your computer dealer if there is a local firm that can print out your disks.

If the printer you are using has a ribbon, put in a new one before you print pages intended for masters. I can't always predict whether any given copy is the last one or not, so I try to keep the ribbon renewed. It is best to use a film ribbon (rather than a fabric one) because it gives a darker, crisper impression. Film ribbons can only be used once, so you don't risk a dim impression from a worn ribbon. Film ribbons can be recycled by sending them back for re-inking. The quality and kind of ribbon is *not* the place to save money.

Printer paper for tractor feeds (with holes at the sides) can be bought with very fine perforations. This is another place to buy the best. Your pages will probably go through a copying machine at some point. After you have torn off the strip of holes, the fine perforations result in an edge that can go through such machines without jamming. Your original will be subjected to lots of handling and wear. Cheap, thin paper doesn't survive as long as good quality paper.

ART

Plan your production process with two goals in mind. One, save yourself labor

whenever you can and don't ever do anything twice if you can help it. There's plenty of essential work. Two, devise systems that prevent human error where possible and catch it when it does occur so you can correct it.

With this first goal in mind, minimize the number of times you need to paste up anything. Pages with pasted art cost more to have copied, since they must be fed into the machine by hand. Some paste-up is necessary, since pictures, charts, and graphs enliven a manual and make it easier to read. Whenever possible, let the computer create the art. Otherwise, you have to add it by hand to your printed master, and do it again when you revise the page.

A calendar passed around a documentation department had the following words of wisdom:

WALLACE WOOD'S RULE OF DRAWING:

1. **Never draw what you can copy.**

2. **Never copy what you can trace.**

3. **Never trace what you can cut out and paste down.**

It's good advice. If you haven't discovered clip art and rub-ons, go to your nearest art supply store and make their acquaintance. These aids make it possible even for the non-artists among us to turn out some good-looking diagrams and illustrations. A catalog of instant art is listed in Appendix D. I keep a copy in my office so I can refer to it as I design a page.

THE PRODUCTION PROCESS 105

No book can really tell you the specific steps in the production process; it depends too much on your situation and local facilities. I suggest that you make friends with the owner of a good print and copy shop near where you work. I was lucky enough to take my thesis typing job to a master of his craft, and I have been learning about print production from him ever since. Look for someone who is meticulous about the details of the job and who will teach you the many skills of preparing high-quality copy.

The example that follows is one used in a documentation department to explain the various terms for the many copies that were created. New clerks, and even new writers, found the names confusing, so this list helped them figure out what the department was doing. In this example, we were creating pages of the usual size (8½" by 11") and then pasting these up side-by-side and reducing them two at a time to make a smaller manual. I don't recommend the method, but it enabled us to produce a usable prototype very rapidly (though with lots of overtime).

WHAT DO ALL THESE NAMES OF COPIES MEAN?

INTERNALLY MADE

RIBBON COPY: **a one-sided original (first generation) from the daisy-wheel printer used to make one copy (internal) and makereadies (external). So named because the ribbon of the printer actually has touched this paper**

ONE-SIDED COPY: **a second generation photocopy used internally**

THE PRODUCTION PROCESS 106

TWO-SIDED COPY: a third generation photocopy used internally to check layout

DUMMY: a taped-together model used to indicate the proper page order

PASTE-UP a ribbon master that has been pasted together in the same order as the dummy; used to create the reduced makeready

EXTERNALLY MADE

MAKEREADY: a second generation copy (from a higher quality photocopier than our in-house (copier) used to print the multiple copies we sell

REDUCED COPY: 8½" x 7" copies that are sold to the public

PRODUCTION CHECKLIST

The second goal for production is to create error-proof systems, and ways to catch errors which slip through before they are fatal. Checklists do this effectively because they eliminate reliance on memory (which often fails in a crisis) and because they enable you to pass your expertise on to someone else.

The list that follows is used to get the ribbon copy ready to go the printer.

CHECKLIST: BEFORE THE CAMERA-READY COPY GOES TO PRINTER

Manual: _____
DN- _____
Date: _____
Checked by: _____

1. Check front matter:

St Rf
___ ___Accuracy of document number (See Document Number notebook)
___ ___Accuracy of title page
___ ___Correct date on copyright page

2. Check page references for accuracy:

___ In manual Table of Contents
___ In chapter Table of Contents
___ In text
___ Have all BLAH's been replaced with page numbers?

3. Check one last time:

___ Version and date on screens
___ Pages and footers (all there? in order?)
___ Screen Alignment

___ Margins
___ Any wrinkled pages?
___ Any yellow pages/clipped pages? (indicating page to be replaced)
___ Does title page have any necessary trademarks?

4. Insert:

___ Problem Report Form (end of P-C-S chapter)
___ Software Registration Forms (one in each manual: pg ____ & pg ____)
___ Required blank pages:
    ___ Footer only: After any page designed for user removal (worksheets)
    ___ No footer:
        ___ After Title Page, Startup
        ___ After Title Page, Reference
        ___ After Reports Table of Contents if it ends with odd-numbered page
        ___ After last page of any chapter ending with odd-numbered page
        ___ Before Problem Report Form IF P-C-S ends on odd-numbered page

5. Make a 1-sided master.

6. Make a 2-sided copy from the ribbon copy and scan it (this is how it will look after printing, folks, so scan critically and carefully). Double-check the page count, using the worksheet that follows. (This helps verify that we have all the pages in place.)

7. Make up a purchase requisition and purchase order.

8. Move ribbon copy from file folders to box.

___ Put colored sheets between chapters
___ Put SPECIFICATION SHEET for printer on the lid. This includes:

- document title
- specs (quantity? drilled? bound? how? etc.)
- deadline
- your name
- company phone #
- number of sides/number of pages total

9. Make photocopies of SPECIFICATION SHEET and Purchase Order and distribute:
   - Orig P/O and orig Spec Sheet - to printer
   - Yellow copy of P/O, orig Req Form, and copy of Spec Sheet - to Production Notebook
   - Pink copy of P/O, copy of Req Form, and copy of Spec Sheet - Accounting
   - Photocopy of P/O, Req Form, and Spec Sheet - Marketing (if charged to Marketing, cost of goods sold)

THE PRODUCTION PROCESS 110

PAGE COUNT WORKSHEET:

		Rbn Copy	2-s Copy	
Startup:	Front Matter.	___	___	
	Intro	___	___	
	Overview	___	___	
	Config.	___	___	
	How To.	___	___	
	Reports T of C . . .	___	___	
	Reports.	___	___	
	. . . . .	___	___	TOTAL STARTUP: _____
Reference:	Front Matter.	___	___	
	Chapter 1	___	___	
	Chapter 2	___	___	
	Chapter 3	___	___	
	Chapter 4	___	___	
	Chapter 5	___	___	
	Chapter 6	___	___	
	Chapter 7	___	___	
	Chapter 8	___	___	
	Chapter 9	___	___	
	Appen	___	___	
	Hints	___	___	

P-C-S . . . . . ___ ___
Gloss. . . . . ___ ___
Index . . . . . ___ ___
. . . . . ___ ___

TOTAL REFERENCE: _____

GRAND TOTAL: _____

SPECIFICATION SHEET

The specification sheet that follows is attached to the copy sent to the printer. It tells the printer what needs to be done and what you expect.

SPECIFICATION SHEET
(Attachment to Purchase Order# _____)
Company Name

TODAY'S DATE: _____

This form accompanies the single/double-sided ribbon/makeready copy of the Startup and/or Reference manual(s) for the _____ system.

_____ is to make _____ double-sided copies

(Xerox 9500 or equivalent) with _____ drilling.
3-hole 5/16" standard

OTHER SPECIFICATIONS: Insert colored sheets between chapters ____

Keep 2 manuals separate ____

Please include one UNDRILLED copy (SINGLE-SIDED) to serve as our back-up makeready.

These pages are pasteup: _____

THE PRODUCTION PROCESS 113

Number of pages (sides): _____ **(This includes blank pages)**

We need this job by _____

(check one) We will pick it up _____
Please deliver: _____**(Company Address)**

PHONE: 123-4567 if there are any questions, and ask for:

_____

or _____

The next list shows the detailed specifications for binders (notebooks) and slip-cases (boxes) that were ordered for one particular manual. The best way to educate yourself about these details and the specialized vocabulary that goes with them is to listen to the experts. Spend a week talking to every salesperson you can and ask each one what makes that particular product better than the competition. Don't believe everything you hear, but listen and learn how to compare, and find out about the quality/cost trade-offs.

THE PRODUCTION PROCESS 114

PURCHASE ORDER DETAIL FOR BINDERS/SLIPCASES

Binders

1. 2 identical binders per set
2. 1½ inch capacity each
3. 11 by 8½ inch sheet size
4. Light gray supported vinyl
5. Boosters
6. D-ring mounted on back cover with nickel-color rivets
7. Round corners
8. Black vinyl lining
9. Straight horizontal pocket on inside front cover 5 inches, fused to lining
10. Full, clear, vinyl label holder on spine, sealed at bottom to hold paper label 1½ by 11 inches
11. Two color silk screening on front cover only (two one-time color charges for set-up)
    Art to be supplied

Slipcases

1. Two binder capacity slipcase
2. 144 pt white lined chipboard
3. Covered in dark gray library buckram
4. No decoration
5. Thumb tabs cut out

THE PRODUCTION PROCESS 115

TIME AND COST

How long will it take to write the manual? How much will it cost? Everyone wants the answers to these essential questions. Accurate answers are dependent on a complex array of factors. A very rough rule of thumb is that a 400 to 500 page manual for an end-user will take six months to create and cost about $40 per copy if produced in lots of less than 5,000.

That rough time estimate assumes that an experienced writer is starting from scratch and working alone with no previous manual to build on as a model. To cut down the time, involve the writer early in the development process. This helps the writer learn the system and helps prevent problems in the design of the system. If a well organized and experienced team is turning out the fifth manual in a series, then obviously they can work faster. I can guarantee that it takes longer to produce a manual than anyone involved with the project believes at the outset!

Costs of production, once the manual is written, depend very much on the facilities available, and on the packaging choices you make. In general, it is a good idea to put out the first printing of a manual in a form that is fairly easy to change, since there will surely be revisions. The 8½" by 11" page in a three-hole binder is the easiest and least expensive to produce and to change. It is sometimes awkward to use because the notebook takes up so much space on a desk. On the other hand, it has the advantages that the pages lie flat and inserting tabbed pages is easy.

The easiest-to-use packaging is frequently not the most elegant from an aesthetic standpoint. Form (the looks of the package) must, in the last analysis, give

way to function (how well does it work?). Spend some time browsing in the computer stores and examining the manuals there. Study especially the manuals for products similar to the one that you are creating.

Consider how easy it is for the dealer to display the package, and how easily it will sit on the user's desk or shelf. Can you distinguish the contents from similar volumes without opening it? Does it fit in and stand out in appearance? Can you spot and identify it across the room? Does the package stand up well to repeated handling? Do the labels tend to peel off or curl at the edges? Is the packaging too complicated to use? Is the box easy to open? Is the size of the manual intimidating? Does the entire package look professional and attractive?

Appendix C contains more information about decision-making in the production process.

CHAPTER ELEVEN

SOFTWARE FOR WRITERS

The demand for good technical writers exceeds the supply, and will probably continue to do so for a decade or so. Several facts contribute to this shortage. One is the reluctance writers have to go into technical fields. Technical writing is perceived to be the antithesis of creative writing. This is not true; the writing of software manuals, particularly for the naive end user, is a creative challenge. Those of us who are in love with words and their power can find a real satisfaction in being exact without being dull. Manual writing should be persuasive writing at its best.

A second contributor to the shortage of good technical writers is the low priority that writing and English skills have received in the schools for the last few school generations. The age of high technology has not made writing obsolete; it has highlighted the need for better writing.

Documentation had a low priority in the computer world until recently. Fortunately, that is changing now and writers are being paid as the professionals they are. As documenters participate more and more in the design stages of a program, their writing will begin to appear on the screen in menus and help

SOFTWARE FOR WRITERS 118

programs, as well as in the manuals.

Managers used to think, and some still do, that they could hire programmers and teach them to write their own documentation. This fallacy has been thoroughly exposed. Programmers, in general, don't like to write and aren't very good at it. The inherent cognitive styles of the programmer and the writer are apt to be different. It turns out to be easier and more effective to hire writers and teach them *about* the program, since they need not know how to program to be able to write about it. Writing is a skill that is absorbed by the time one graduates from high school; it is very difficult to teach to an adult who has not already shown a flair for it. One can, of course, teach specific skills within writing, and writers certainly improve with experience, but the basic talent and knowledge is established before adulthood.

Software for writers can certainly be helpful, especially for increasing efficiency. Any review of specific programs would be out of date or incomplete very soon. I suggest that you check recent issues of the computer magazines for current information on what is available. Appendix D lists the names of the friendliest magazines.

WORD PROCESSING

Word processing programs are the basic tools of the technical writer. A powerful word processing program takes a good many hours to learn. The point of word processing is to put everything possible on "automatic pilot" so that fingers go where they should automatically. Ideally the signals are sent from screen to eye to brain to fingers and back to screen in a smooth and almost unconscious flow.

Machines that are dedicated word processors (you can't program on them or

run any other software on them) are generally large and expensive. Few writers will want to buy one for use at home and only a large documentation department can afford to have a dedicated machine. More useful, in general, is a versatile computer with a good word processing program.

Often the ideal situation is two computers sitting side-by-side, with the software that the writer is documenting actually up and running on one, and the text for the manual being created on the other. The writer can look at the same screen the user will see and describe it. The writer can also test the steps as they are written to see if they are correct and complete.

Before committing yourself to a computer, and a word processing program, try out the keyboard by typing and printing a number of pages. Find out how comfortable the setup is for working hour after hour. Most software was designed for the user who needs to send 1,000 copies of a letter to a list, changing the "Dear" on each one. The documenter never wants to do that. Will the disk accommodate one or more chapters that are forty pages long? Ask about a "long documents package" for the software.

There is a new kind of computer just entering the market as I write this that is going to change the world for writers. The Xerox Star is the first and most expensive of these new machines; the various models of the Lisa, and the Macintosh (both from Apple), are the newest members of the family. I found that working with a mouse on these computers, instead of cursor keys, was intuitively elegant; the device truly became an extension of my fingers. The icon or picture approach set free my imagination and allowed me immediate access to powerful capabilities. Designing pages, changing fonts (from Gothic to Old English, for instance) and point size (from very small letters to very large ones) is as easy as pressing a key. There is no waiting to see what the page will look like when typeset. Instead of just upper or lower case, bold or underline, sud-

denly writers will have a whole paintbox full of ways to categorize, emphasize, and express things of relative importance. Pictures, graphs, and diagrams can be incorporated into the text as part of the writing process instead of being added later. The creative possibilities are just beginning and I urge you to try out this new kind of computer.

SPELLING CHECKERS

Most word processing programs have accompanying programs that check the spelling of each word against a large dictionary. Peter McWilliams (see Appendix D) has an excellent review of one of these. He recommended one program so highly that I bought it for a documentation department. One of the writers used it extensively; the others (including me) never touched it. Certainly anyone whose spelling skills are shaky would benefit by one of these programs. Beginning writers may benefit from the ability of such a program to spot redundancies and wordy phrases.

PRINTING SCREENS

The most helpful feature a computer or program can offer the writer is the ability to print the screen of the program. Let's say you are running an accounting program and want to describe the screen the user sees. Some computers have a Print Screen key. If you can press a key and print the screen that the user sees, then you can incorporate that screen in your manual exactly as it appears to the user. Otherwise, you find yourself drawing endless vertical and horizontal lines (not easy with most word processing programs and printers) and trying to guess at the precise placement of various phrases on the screen.

SOFTWARE FOR WRITERS 121

If no print screen key is available, sometimes you can get the programmer to write a little program enabling you to print screens on demand. However you do it, find a way to capture screens early in the process. You may have to exert considerable pressure to get help on this, but it is worth every ounce of energy you expend.

PROGRAMS THAT DOCUMENT

There are several programs on the market that lead you through the process of documenting a piece of software. They impose their own structure on the documentation and remind you to specify certain program characteristics. They are most useful for programmers writing their own documentation. I suspect that these programs are something like paint-by-number pictures; sound in the manner that they represent reality, but a little lacking in aesthetic value. If a programmer took the time to prepare one of these documenting programs for the software, it would probably form a very useful basis for a manual created by a writer.

123

ASHTON·TATE

CHAPTER TWELVE

TRICKS OF THE TRADE

Every documention department develops certain jargon. Though this jargon may be meaningful only to a particular group, it has usually evolved to meet needs common to all documentation writers. Here are some samples of one department's internal jargon.

Boilerplate **This term is common in the computer world in several contexts. In documentation it means the parts of a manual that remain the same from chapter to chapter, volume to volume, manual to manual. If you have a standard introduction, a standard form for the chapter table of contents, a standard sheet used by the reader to evaluate the manual—these are all boilerplate. The content of boilerplate may change slightly, but most of it remains the same every time you use it.**

TRICKS OF THE TRADE 124

Futures File This is the file folder where you stick the little pieces of paper that tell you how to do it better next time. Every time somebody informs you of a change it would be nice to incorporate in the next version (not the corrections you *must* do), jot it down and stick it in the futures file. Then, before you revise or reprint, check the file for those good ideas that were so obvious at the time, but that you tend to forget after a while.

L & G This stands for Latest and Greatest. The version of the manual that is the most recent and the most correct is called the L & G. If you have to print a draft or preliminary copy fast, this is the master to use.

Drop Dead The drop dead philosophy holds that all files and all work on documents is kept in such condition that, if the writer dropped dead tomorrow, another member of the department could pick up the work and continue it. An extension of this way of working is to keep a draft manual in readiness to print at any time. Frequently the marketing department may want to show off a new product in the developmental stages, and insist that you give them one copy of the manual, even in an imperfect state. Working in a drop dead mode means that the whole manual is put together in a preliminary way before any one chapter is polished to perfection.

Ripples These are changes that affect more than one writer. The following memo tells writers how to ripple changes. There is a Ripple Form in Appendix B.

TRICKS OF THE TRADE 125

RIPPLES

Type 1 - Between Manuals

Ripples are changes or corrections in boilerplate material. To keep manuals consistent, the changes need to be made in the parallel pages of the other manuals.

Type 2 - Within a Manual

These ripples are changes in a manual that have repercussions to other pages in the same manual. For example, if a numerical value is changed in the How-To Chapter, it may have an effect on one or more reports in the Reports Chapter.

If in doubt—Ripple It

To Ripple:

1. Mark or highlight changes
2. Say which manual
   chapter
   page
3. Say who it is from
4. Give one copy to each member of the department

5. Put one copy in your files

6. Date it

If you need to work a miracle and produce an instant manual (just add sweat and stir), several writers may be working simultaneously. If two people make changes in a chapter at the same time, endless confusion may result. A button system solves this problem. (This system got its name from the child's game "Button, button, who's got the button?").

The memo that follows describes how the button system worked for one team.

WHO'S GOT THE BUTTON?

The BUTTON BOARD is our way of letting our co-workers know these things:

1. Who has the ownership of any given file at this time.

2. Where the latest and greatest edition of any given file lives.

Here's what makes up the BUTTON BOARD:

1. Charts listing all the files (usually one per chapter) for each manual.

2. Push pins color-coded for each staff member.

TRICKS OF THE TRADE 127

Current Process

A file (or files) is copied from the hard disk onto a floppy disk by the production manager (PM). The PM then places the writer's push pin on the BUTTON BOARD next to that file. This means "Don't do anything to this file unless you are the current writer."

The writer edits the file. When the writer finishes with the file, the writer gives the floppy to the PM and places a red push pin on the left of the boxes. The red pin indicates that the file has been changed and needs to be backed up.

The PM puts the file on the hard disk, places a PM-colored push pin next to that file on the button board, and gives the floppy disk back to the writer. The PM puts the date the file was transferred to the hard disk on the floppy disk label.

The following sign appeared one day over the printer. I do not know the source, but I am grateful for this profound statement of truth.

TRICKS OF THE TRADE 128

WARNING!

This machine is subject to breakdowns
during periods of critical need.

A special circuit in the machine called a "critical detector" senses the operator's emotional state in terms of how desperate he or she is to use the machine. The "critical detector" then creates a malfunction proportional to the desperation of the operation. Threatening the machine with violence only aggravates the situation. Likewise, attempts to use another machine may cause it to also malfunction. They belong to the same union. Keep cool and say nice things to the machine. Nothing else seems to work.

Never let anything mechanical
know you are in a hurry.

TRICKS OF THE TRADE 129

In a documentation department with several writers and an assortment of shared machines, it is helpful to post a list of simple directions beside each machine. Two example lists of hardware directions follow. These steps may or may not apply to your machines, but they show the style and level of the instructions.

SELF-CONTAINED FLOPPY SYSTEM

To Turn On

1. **Turn on power key.**
2. **Turn on terminal (switch on back of video screen) and wait for the blinking cursor.**
3. **Insert program disk.**
4. **Press red reset button.**
5. **Type WS**

To Turn Off

1. **Return to the system level. This can be done from *Wordstar* by typing an X.**

2. Turn off the terminal.

3. Remove any floppy disks from the disk drives.

4. Turn off the key.

HARD DISK

To Turn On

1. Turn on key to power supply box. The power supply is the box with the red reset button and the key in it.

2. Turn on switch on power strip plug. This turns on the disk drives which live in the box on top of the power supply box.

3. Turn on terminal. The switch is on the lower back on the left side when facing the screen.

4. Insert "CP/M Hard Disk" diskette in drive A. The CP/M disk will be in the front of the box of disks on the computer table.

5. Press red reset button on power box.

6. Turn on hard disk. To do this, press the red switch on the back of the hard disk. The back is facing the terminal.

7. Wait two minutes to give the computer time to warm up.

8. Type E: or F: depending on what drive you want on the hard disk. Check the filename list to determine this. Press the <RETURN> key after you type in the designated drive.

9. Your prompt will appear. Everything is go.

To Turn Off The System

1. Exit to CP/M. This can be done from *WordStar* by typing an X.

2. When the prompt (A>, E>, or F>) shows on your screen, type A: and press the <RETURN> key. You should now have an A> showing on your screen.

3. Turn off the hard disk.

4. Take any floppy disks out of the disk drives by pressing the black bar under the floppy disk drive door.

5. Turn off the terminal.

6. Turn off the key on the power box.

7. Turn off power strip if you are the last one to leave.

CHAPTER THIRTEEN

THE LAST WORD

Making mistakes is a forceful way to learn correct procedures. Some lessons, however, cost more than others. No one who has accidentally erased two hours of work is likely to forget the experience. The points in the following list may help you avoid some of my mistakes and leave you free to invent your own!

EXPENSIVE LESSONS

1. **Label disks, files, copies, and manual drafts with full information.**
2. **Use the written instructions posted by each machine to turn on and off hard disks.**
3. **Don't finish the manual before the software is finished.**

4. **Check to see that *all* parts of the manual (backs, covers and so forth) that were ordered did indeed arrive.**

5. **Count everything that is received immediately!**

6. **Turn off all computers if the weather is ominous and it looks as though lightning may strike.**

7. **In *WordStar* the .BAK file is the copy *before* the one you're working on, so save each file as you go along to keep the backup files updated.**

8. **As you work, SAVE your text every page or two.**

9. **Make backup disks at least once a day.**

10. **Use tabs and margins to indent and space text — do *not* add spaces with the space bar to make it look right.**

NAMING FILES

Careful naming of your files on the computer saves lots of time. You have to design and evolve your own system, but there are some points to consider as you establish your naming conventions. Bear in mind the characteristics of your word processing system. In *WordStar*, you can use up to eight letters and digits for the name of a file, plus an extension that is a period followed by three letters.

One naming system uses the extension to distinguish between text files (.TXX) and screen files (.SCR). There is a problem in this naming system that makes it inconvenient at times. When you name a file CHAPTWO.TXX (contains the text for chapter two) and another file CHAPTWO.SCR (contains the screens for chapter two), *WordStar* creates backup files for both of these that are named CHAPTWO.BAK. If both the .TXX and the .SCR file are on the same disk, then the .BAK file will contain only the backup of whichever file was saved most recently. I finally decided to leave the extension to *WordStar*, since the system requires it for BAK. This leaves eight characters to name a file. I put the title of the chapter or section, as listed in the table of contents, with all of the vowels left out. If necessary, I leave out some of the consonants too. I reserve the last character, or the last two, to hold the number of the chapter. For example, this chapter, number thirteen, is named LSTWD13. This enables me, or anyone else, to print out the files in order with the ending numbers. Anyone who has a copy of the table of contents can usually figure out what the abbreviated title is supposed to be.

I keep three levels of backup disks. The first is the original disk, the one I purchased. The second is a copy of that labeled "Copy only, Do Not Use" and the third is a backup working disk. I store these in different places. Once, after a heavy rain, the ceiling of an office of mine literally fell in; another time a friend of mine had all his disks except those stored in an upstairs room ruined in a flood. Take the trouble to store a backup copy in another place.

UPDATING AND MAINTENANCE

All manuals need to be brought up-to-date to reflect changes in the system. As the design of the manual evolves, the older editions will need to be brought

into line with the new look. You will discover, or be told about, mistakes in the text that must be corrected. All this falls under the general heading of manual maintenance.

Writers generally prefer to work on the newest system instead of doing maintenance on an established manual. If you can, assign the newest writer, or a writer-in-training, to this job. It's an excellent way to become acquainted with the system and the manuals.

What do you do when you discover an error in a just-printed manual that is going to lead the user into doing something wrong, perhaps disastrous? If you discover this after the manual has been shipped, you don't have much recourse. That is why it is so important to check and recheck the facts and sequences of operations *before* the final version goes out. The testing of the completed manual by a naive user should identify these errors before it's too late.

If your manual has been printed and bound, you can insert a correction sheet. This looks bad, and quite correctly leaves the impression that the original manual was done without enough quality control. There is no need to put in an "errata" sheet for bad punctuation, misspellings, or inconsistent spellings. These are painful to a careful author, but most readers will not notice them. Consider whether or not your error in the manual will cause the reader to do something wrong. If not, resolve to proof more carefully next time, put a note in the proper place to correct the error before the next printing, and try to forget the guilt.

There are good reasons why the first version of a manual should be in a loose-leaf binder. This form makes it possible to add material at the last minute and to replace an erroneous page with a newly-printed correct one. Replacing pages in a completed manual is a tedious, labor-intensive job. If the people who let the mistake get by in the first place are part of the team that does this replacing, the effect on accuracy in the future is highly salutary.

THE LAST WORD 137

SOP

The more Standard Operating Procedures (SOP) you develop and adhere to, the more time and energy you have to devote to the creative task of interpreting technology to human beings. Shared tasks, expertise, and equipment make possible a dynamic atmosphere of efficient productivity and synergy, but such sharing is dependent on a common way of doing things. The guidelines and policies must be evolved and elicited from the group; imposed rules simply don't work.

APPENDIX A

PROOFREADER'S MARKS

This appendix lists the marks for editing that writers need most often. You can give a standard list such as this one to typists and those who do the word processing, as well as all writers, programmers, and reviewers.

Ask your reviewers to go one step farther than just circling or making a question mark by certain words. Request that they write in the text the way they think it *should* be. This method saves time since it minimizes conferences. It also helps to minimize the defensiveness inherent in the editing process.

STANDARD PROOFREADER'S MARKS

~~delete~~	(e) delete and close up
⊂ close	# space
¶ new paragraph	no ¶ no new paragraph
transpose letters	words transpose
lc SET in lowercase letters	cap set in capital letters
ital set in italics	bold set in boldface
^ insert	stet do not make correction indicated
sp spell out numeral: 1	fig set as numeral: one
query, verify: Mosel ?	
lc lowercase	c&lc in both upper and lowercase

/tab To indent this paragraph

to move this paragraph flush left

TO CENTER THIS TITLE

To show the alignment

of various

items

such

as

these.

APPENDIX B

FORMS FOR A DOCUMENTATION DEPARTMENT

This appendix contains sample forms, all actually used in a documentation department. They illustrate the communication that a documentation department needs to have with others in the company, with printers, reviewers, and suppliers, and with others on the documentation team.

REQUEST FOR NEW DOCUMENTATION

Your Name _____ Today's Date _____

1. What project needs documentation? Please give the *name* if it has one:

2. Who is the programmer or developer responsible for the product?

3. What documentation, manuals, or notes *already* exist? (Please attach to this request if possible.)

4. Who is the intended audience for this manual?

   ____ Internal (Company personnel only)
   ____ Programmers
   ____ Dealers
   ____ Distributors
   ____ End Users

5. Approximately how many pages (a page is *one side* of a sheet—it has a page number) do you think the manual will need to be? _____

6. Please give a reasonable date by which you want the manual to be ready to distribute. _____

7. How many copies do you think will be needed in the first three months of production? _____

Document number: Send to _____

REQUEST FOR REPRINTS OF EXISTING DOCUMENTATION

REQUESTED BY _____ DATE REQUESTED _____

DEPARTMENT _____ NAME _____

CHARGE TO _____

MANUAL NAME _____

PROGRAM VERSION NO. _____ MANUAL DN NO. _____ (If known)

ELEMENTS NEEDED: HOW MANY:

____ TEXT (2 VOLS.) ONLY _____

____ SLIPCASE (2 BOXES) ONLY _____

____ ENTIRE MANUAL PACKAGE _____

OTHER (SPECIFY) _____

NEEDED BY WHEN _____

INHOUSE USE _____ SOFTWARE DIST. _____ SPECIAL _____

EXPLAIN _____

EMERGENCY LEVEL: Please describe the urgency below so that if turnaround time is too short to fill the order in our usual way, we can then discuss with you the options and costs of filling this order in the time frame you have given us.

____ 1 - EXTREME URGENCY - Must have these manuals - Spare no cost
____ 2 - URGENT - Important, but let's look at costs also
____ 3 - NO URGENCY - Cost is first consideration
____ 4 - NO BIG DEAL - Whenever you can get to it

**Please note that for special needs, *parts* of manuals may also be reproduced. We will be happy to consult with you regarding your specific needs and the best way to satisfy those needs.

ORDER NO _____
(Filled in by Documentation Department)

Document number:

Send to _____

REQUEST FOR REPRINTS
OF
EXISTING (8-½ × 11) DOCUMENTATION

REQUESTED BY _____ DATE REQUESTED _____

DEPARTMENT _____ NAME _____

CHARGE TO _____

MANUAL NAME _____

PROGRAM VERSION NO. _____ MANUAL DN NO. _____
(If known)

ELEMENTS NEEDED:	HOW MANY:
____ ENTIRE MANUAL	_____
____ PRINTED MATTER ONLY	_____
____ TABS ONLY	_____ (sets)
____ BINDERS ONLY	_____
____ INTERNAL SHINY COVERS	_____ (sets)

OTHER (SPECIFY) _____

NEEDED BY WHEN _____

INHOUSE USE _____ SOFTWARE DIST. _____ SPECIAL _____

EXPLAIN:

EMERGENCY LEVEL: Please describe the urgency below so that if turnaround time is too short to fill the order in our usual way, we can then discuss with you the options and costs of filling this order in the time frame you have given us.

____ 1 - EXTREME URGENCY - must have these manuals - Spare no cost
____ 2 - URGENT - Important, but let's look at costs also
____ 3 - NO URGENCY - Cost is first consideration
____ 4 - NO BIG DEAL - Whenever you can get to it

**Please note that for special needs, *parts* of manuals may also be reproduced. We will be happy to consult with you regarding your specific needs and the best way to satisfy those needs.

Document number: Send to _____

COMMENT SHEET - SECTION _____

REVIEWER'S NAME _____ DATE _____

1. LIST OF ERRORS

On page:

_____ _____ should be changed to _____

_____ _____ should be changed to _____

_____ _____ should be changed to _____

_____ _____ should be changed to _____

_____ _____ should be changed to _____

_____ _____ should be changed to _____

_____ _____ should be changed to _____

2. What problems do you have with this section?

3. What would you like changed?

4. Other suggestions?

Document number:

Send to _____

In order to include your ideas, we need this by _____

MANUAL REVIEW FORM
Stage 1, Working Draft

Manual _____ Writer _____ Date _____

This is the first formal review draft for this manual. Please mark your comments directly on the document in a contrasting color of ink and clip each marked page. If you have general comments on the manual as a whole, please write them on a separate page.

At this stage all aspects of the manual are open to review. Please evaluate the document for technical accuracy, appropriateness of style, and clarity of presentation.

Reviewers are asked to check specific aspects of the draft, as indicated below.

Programmer

- Have we described the product correctly?
- Do the messages, menus, and input forms appear on the screen as described in the manual?
- Did we miss documenting any features?
- Is the description presented in a logical order?
- Do the procedures work as we described them?

General Readers

- Is the description presented in a logical order?
- Are the directions and descriptions clear?
- Is the manual aimed at the appropriate audience?
- Have we been consistent from chapter to chapter?

Please sign this form and return it to _____ along with

your marked copy of the draft.

Thanks!

Signature

Document number:

Distribution:

In order to include your ideas, we need this by _____

MANUAL REVIEW FORM
Stage 2, Completed Draft

Manual _____ Writer _____ Date _____

This is the completed draft for this manual. At this stage please review for accuracy of detail and clarity of explanation. *No further reorganization or style changes are planned.* Mark your comments directly on the document in a contrasting color of ink and clip each marked page. If you have general comments on the manual as a whole please write them on a separate page.

Certain reviewers are asked to check specific aspects of the draft, as indicated below.

Programmer

- Have we described the product correctly?
- Do the messages, menus, and input forms appear on the screen as described in the manual?
- Did we miss documenting any features?
- Is the description presented in a logical order?
- Do the procedures work as we described them?

General Readers

- Is the description presented in a logical order?
- Are the directions and descriptions clear?
- Is the manual aimed at the appropriate audience?
- Have we been consistent from chapter to chapter?

Please sign this form and return it to _____ along with your marked copy of the draft.

Thanks!

_____

Signature

Document number:

Distribution:

DOCUMENTATION EVALUATION

PLEASE TAKE A LITTLE TIME TO TELL US HOW WE'RE DOING:

1. Place one check mark on each scale below to describe this document:

Easy to use	:___:___:___:___:___:	Hard to use
Friendly	:___:___:___:___:___:	Cold
Worth the time	:___:___:___:___:___:	Waste of time
Complete	:___:___:___:___:___:	Too much detail
Clear	:___:___:___:___:___:	Difficult
Easy to find what I needed	:___:___:___:___:___:	Couldn't find what I needed
Understandable	:___:___:___:___:___:	Hard to understand
Too much information	:___:___:___:___:___:	Not enough information
Useful	:___:___:___:___:___:	Not useful

2. Did you read the entire document? YES NO
(Circle one)

   If NO, what parts did you read? _____

   WHY did you skip the rest? _____

3. What one change in this document would cause you the most joy?

   _____

   _____

   _____

4. What would you *add* to this document?

   _____

5. **What would you *delete* from this document?**

6. **Would you recommend this document to a colleague? Why or why not?**

7. **What errors need to be corrected?**

Page #	now says	but should say

8. Please indicate your experience by circling the most appropriate word:

Computers:	Beginner	Moderately Experienced	Proficient
Accounting:	Beginner	Moderately Experienced	Proficient

9. Other comments:

_____

_____

_____

Document number: Send to _____

SUGGESTED REVISION FOR THE STYLE MANUAL

Your Name: _____ **Date:** _____

COMMENTS:

Document number: **Send to** _____

DOCUMENTATION CHANGE RECORD
(for use by writers)

Document Name: _____

From Document # : _____ **To Document # :** _____

PAGE	PARAGRAPH	LINE	CHANGE

Document number:

Send to _____

RIPPLE FORM

A "ripple" is a change in one document, manual, or page of a manual that affects other documents, manuals, or pages in a manual. For example, if the name of the program is changed from EasyDo to EZDo, then it must be changed everywhere. The writer who first learns of the change, or makes it, uses this form to inform all the other writers.

Date: _____ **From:** _____

The following change has been made:

Manual:

Page:

Old version:

New version:

As far as I know, this change also needs to be made in these places:

Document number:

Distribution:

BID SHEET - PRINTING

TODAY'S DATE: _____

FIRM NAME: _____

CONTACT: _____

TELEPHONE: _____

This bid is based on reproducing a 2-volume manual from a single-sided ribbon copy which we provide. This sample is made up of a Startup Manual (6 chapters, 176 pages) and a Reference Manual (15 chapters, 319 pages), with a total of 495 pages to be reproduced.

We require:

___ 250 double-sided copies (Xerox 9500 or equivalent)
___ 3-hole 5/16" standard drilling
___ 1 single-sided, undrilled copy (to serve as our backup makeready)
___ Keep the 2 manuals separate (slipsheeting is acceptable)
(If shrink-wrapping is offered, what is the charge? _____)
___ Insert colored sheets between chapters
___ We assume no pasteup pages will be included

What is your firm's standard turn-around time? _____

What is your policy on rush jobs? _____

Do you pick up orders? _____ Do you deliver? _____

Is there a charge for either of these services? _____

Notes:

Document Number:

Production Manager
Documentation Department
Company Name and Phone

MANUAL ORDER FORM
REPRINTS
(Documentation Department Follow-up)

Refer to ORDER NUMBER _____ (from Document Number: _____)
(Approved by: _____)
Software system _____

			Total Ordered	Date	Vendor
1. Slipcases	Outside	_____			
	Inside	_____	_____	_____	_____
	(Specifications Complete _____)				
2. Covers	Startup Front	_____			
	Startup Back (blank)	_____			
	Reference Front	_____			
	Ref. Back (blank)	_____	_____	_____	_____
	(Artwork Complete _____)				
3. Labels	Front (2" round)	_____			
	Spine (2" round)	_____			
	Small (rectangle)	_____	_____	_____	_____
	(Artwork Complete _____)				
4. Text Reproduction	Startup	_____			
	Reference	_____	_____	_____	_____
	(Master Ready to Print _____)				
5. Binding	Startup	_____			
	Reference	_____	_____	_____	_____

	(1)	(2)	(3)	(4)	(5)
Purchase Requisitions Complete	____	____	____	____	____
Purchase Orders Complete	____	____	____	____	____
Signatures Obtained	____	____	____	____	____
Purchase Order Numbers Assigned	____	____	____	____	____
Paperwork Copies to _____ (dept)	____	____	____	____	____
Purchase Orders Delivered	____	____	____	____	____
Goods Received and Counted	____	____	____	____	____
Order Closed; Paperwork to Acctg	____	____	____	____	____

Document Number:

SPECIFICATION SHEET

(Attachment to Purchase Order# _____)

Company Name

TODAY'S DATE: _____

This form accompanies the single/double-sided ribbon/makeready copy of the Startup and/or Reference manual(s) for the _____ system.

_____ is to make _____ double-sided copies (Xerox 9500 or equivalent) with _____ drilling.
3-hole 5/16" standard

OTHER SPECIFICATIONS: Insert colored sheets between chapters ____

Keep 2 manuals separate ____

Please include one UNDRILLED copy (SINGLE-SIDED) to serve as our backup makeready.

These pages are pasteup: _____

Number of pages (sides): _____ (This includes blank pages)

We need this job by _____

(check one) We will pick it up _____

Please deliver: _____ **(Company Address)**

PHONE: 123-4567 if there are any questions, and ask for:

_____

or _____

CHECKLIST: BEFORE THE CAMERA-READY COPY GOES TO PRINTER

Manual: _____
DN- _____
Date: _____
Checked by: _____

1. Check front matter:

St	Rf	
___	___	Accuracy of document number (See Document Number notebook)
___	___	Accuracy of title page
___	___	Correct date on copyright page

2. Check page references for accuracy:

___ In manual Table of Contents
___ In chapter Table of Contents
___ In text
___ Have all BLAH's been replaced with page numbers?

3. Check one last time:

___ Version and date on screens
___ Pages and footers (all there? in order?)
___ Screen Alignment
___ Margins
___ Any wrinkled pages?
___ Any yellow pages/clipped pages? (indicating page to be replaced)
___ Does title page have any necessary trademarks?

4. Insert:

___ Problem Report Form (end of P-C-S chapter)
___ Software Registration Forms (one in each manual: pg ____ & pg ____)
___ Required blank pages:

___ Footer only: After any page designed for user removal (worksheets)
___ No footer:
  ___ After Title Page, Startup
  ___ After Title Page, Reference
  ___ After Reports Table of Contents if it ends with odd-numbered page
  ___ After last page of any chapter ending with odd-numbered page
  ___ Before Problem Report Form IF P-C-S ends on odd-numbered page

5. Make a 1-sided master.

6. Make a 2-sided copy from the ribbon copy and scan it (this is how it will look after printing, folks, so scan critically and carefully). Double-check the page count, using the worksheet that follows. (This helps verify that we have all the pages in place.)

7. Make up a purchase requisition and purchase order.

8. Move ribbon copy from file folders to box.

___ Put colored sheets between chapters
___ Put SPECIFICATION SHEET for printer on the lid. This includes:
- document title
- specs (quantity? drilled? bound? how? etc.)
- deadline
- your name
- Company phone #
- Number of sides/Number of pages total

9. Make photocopies of SPECIFICATION SHEET and Purchase Order and distribute:
- Orig P/O and orig Spec Sheet - to printer
- Yellow copy of P/O, orig Req Form, and copy of Spec Sheet - to Production Notebook
- Pink copy of P/O, copy of Req Form, and copy of Spec Sheet - Accounting
- Photocopy of P/O, Req Form, and Spec Sheet - Marketing (if charged to Marketing, cost of goods sold)

PAGE COUNT WORKSHEET:

		Rbn Copy	2-s Copy	
Startup:	Front Matter	____	____	
	Intro.....	____	____	
	Overview	____	____	
	Config.....	____	____	
	How To	____	____	
	Reports T of C ...	____	____	
	Reports.....	____	____	
	.....	____	____	TOTAL STARTUP: ____
Reference:	Front Matter	____	____	
	Chapter 1	____	____	
	Chapter 2	____	____	
	Chapter 3	____	____	
	Chapter 4	____	____	
	Chapter 5	____	____	
	Chapter 6	____	____	
	Chapter 7	____	____	
	Chapter 8	____	____	
	Chapter 9	____	____	
	Appen.....	____	____	
	Hints	____	____	
	P-C-S	____	____	
	Gloss.....	____	____	
	Index	____	____	
	.....	____	____	
				TOTAL REFERENCE: ____

GRAND TOTAL: ____

APPENDIX C

PACKAGING AND PRODUCTION DECISIONS

This appendix consists of a memo that describes how one documentation department decided between vendors for the packaging and production of manuals. This memo may be useful to you, not because you will adhere to these same standards in making your decisions, but because it discusses and illustrates the *process* of deciding which vendors and processes to use. The questions remain essentially the same, although the answers will differ.

HOW PURCHASE ORDER DECISIONS ARE MADE IN THE DOCUMENTATION DEPARTMENT

The purchase of manuals, their packaging, and associated tasks, is not exactly the same as purchasing X number of widgets. Some vendors, on some tasks charge by the process and the charge may be dependent on the time it takes to perform the process. A vendor may or may not be able to accurately predict the

steps and the time for a new process that differs from a previous one. The cost and availability of materials may vary. Finding the best way to do things may be the result of a mutual learning and experimentation process between the documentation department and the vendor.

Each of the nine principal factors involved in these decisions is discussed in the following paragraphs. These factors are cost, quality of the work, size of the order, time the vendor takes, time we have, quality of the vendor, our relationship with the vendor, difficulty of the job, and location of the vendor.

1. COST

We determine the cost in several different ways.

If the order is a repeat of something we have already done, we look up the actual cost of the previous order. Almost always, the repeat order is *not* exactly the same so we have to pro-rate (or make a good guess by linear interpolation) to determine the cost of the new order. Then we check with the vendor to see if the expected price has changed for some reason.

If the order is a particularly large one, or if we were dissatisfied for some reason with the last vendor, and *if we have time*, we will get bids from one or two more vendors, if doing so fits with the other factors explained in this list.

If the order is a new one, we usually send exactly the same set of written specifications to several vendors to get written bids. We do this particularly when we are designing new packaging, for instance. However, when we had to

turn out new packaging in exactly one month, we got estimates from trusted vendors who had been the low bidders in the past and went with those.

We may get estimates on the phone or in writing. This depends on some of the other factors in this list. The Production Manager always takes verbatim notes as she talks on the phone to a vendor.

We also consider in the cost whether or not shipping is included, whether or not the estimate is comprehensive (or will extra costs be added on?), and whether the actual cost from that vendor is close to estimates in the past.

2. QUALITY OF THE WORK

The Production Manager has interviewed many vendors and has looked at their samples for quality, and listened to what they consider important in doing a job.

There is a real advantage to sticking to a vendor with whom we already have a good relationship and whose quality we know is reliable. If we make a vendor aware of our high standards, and the vendor learns that we *do* pay attention to quality and take the time to examine and reject poor work, the vendor tends to be more careful with our jobs.

Experience leads us to stop doing business with some vendors, even the low bidder, because we have had to reject work repeatedly (which screws up everybody's schedules) and because we had to check every single item of the work (which uses up enormous amounts of time). Other vendors, we have learned,

will isolate the inevitable few bad items themselves and send them to us with a notation that these are the bad copies.

It is for reasons of quality that we are reluctant to give a large order to a new and untested vendor, especially when we do not have time to reject an unsatisfactory order, send it back, and wait for it to be done again.

3. SIZE OF THE ORDER

If the item is a new design, and not a stock item, we prefer to do it first in a small order, so that we can test the vendor and everyone at the company can react to the new design. Then we like to follow up with a larger order, using the same vendor.

Obviously, when we get into orders of 5000 or more sets, these are going to take lots of time and money. It then makes sense to take the lead time to send several new vendors a sample of our slipcase and manuals and to collect written bids on the job. Below 5,000, vendors are understandably reluctant to keep submitting written bids on detailed specifications, especially if they never get the order—you can only get somebody to do that so often, and they do not do it quickly. We get fairly fast bids from salespersons with whom we have established a relationship. In any case, it takes a minimum of a week to get a written bid. Each item of our manual set has to be figured (often several alternate ways) and the availability and cost of materials from other suppliers enters into the figuring.

Bids for our kind of work are particularly difficult. An order for 250 manu-

als may be run one way, with one kind of paper and on a certain machine, while that same job for 1,000 manuals may be more economical with a different process on a different machine. The process is quite complex, and a purchase order is usually the result of considerable conversation and consultation between a Production Manager and a vendor. The process also takes time.

We tend to have small orders produced in the easiest, quickest fashion. With larger orders, we either take lots of time to work them through carefully, or we use a tested vendor.

4. THE TIME THE VENDOR TAKES TO DO THE JOB

In this category we consider the time that the vendor says it will take to do the job, and how well this vendor has stuck to predictions in the past. Often a particular vendor has a complex schedule and can offer us a window at the time that we phone. If we miss getting our order in that window, then the time to get the work back may be extended. We learn that certain vendors will go to considerable effort to fit us into their schedule; others are less willing to be flexible.

Sometimes a short time estimate has been given by a vendor who then did the job incorrectly or incompletely, so that the original time estimate was misleading in the final analysis. Again, experience lets us avoid these situations.

The time estimate often depends on whether the vendor has our particular paper, inks, and materials on hand. Repeat orders are thus apt to be faster as a vendor learns to anticipate our probable needs.

5. TIME WE HAVE BEFORE THE JOB MUST BE COMPLETE

If we are in a hurry for a job (and we nearly always are) we tend to go with as many known quantities as possible.

We have, in the past, sent out an identical set of specifications to several vendors and gotten bids in writing. We use this baseline set of bids to judge where a vendor falls in the spectrum from low to high bidder. Whenever we can, we repeat this process to get new information. When we don't have time, we make the assumption that the relative estimates of the vendors will stay roughly the same.

6. QUALITY OF THE VENDOR

Does the vendor give reliable quotes of both price and time? Is the work of a reliable quality? Will any errors be made good at no cost to us? What is the reputation of the vendor in the business?

7. OUR RELATIONSHIP WITH THE VENDOR

Vendors give lower bids to customers who can be relied upon to pay on time. The folk wisdom in the business is that the faster a customer demands the work, the slower the customer will be to pay.

We save time and effort with repeat business, and we don't have to go through the process of establishing credit. We can thus exploit a good relationship if we are ever slow paying for some reason.

How much quality attention have we gotten from the salesperson? Has the salesperson been willing to work with us when we change our mind, or when we don't know exactly what we're doing? Has the salesperson been willing to work up speculative bids for us in the past?

8. THE DIFFICULTY OF THE JOB

Are we buying a stock item? Our packaging for the manuals, for instance, is not a standard size or design.

To get competitive bids for the slipcases and the binding, we would have to send a sample to each bidder. We would probably want also to see a sample from each firm to make sure the art is right, etc. This means sending the original art to get bids, perhaps to several places.

If a firm is willing to make a sample, it usually costs about $50 (unless the firm later gets the order), and takes several weeks. If we require samples (which is safer), we have to create multiple copies of the original art, which is also expensive.

9. LOCATION OF THE VENDOR

On small jobs in town, we try to do business with those firms that are nearby or easy to get to. We do not have a person whose job it is to run errands, so time spent fetching and carrying from the printer is time taken away from other tasks. This also costs money.

For larger tasks where we must go out of town, we try to stay as close to our office as possible so we can drive to our supplier to deliver or to pick up an order in an emergency situation.

We try to maintain as much control over, and access to, the situation as we reasonably can. It is also reasonable to minimize shipping and delivery costs as much as possible.

When the size of the production orders warrants it, it is our intention in the future to solicit competitive bids from, and send samples to, a number of the many firms with whom we have talked, regardless of their location. That's a different ball game altogether from the developmental, evolutionary one we have been playing so far.

TWO NOTES:

A. As a matter of standing policy, we track costs, decisions, and actions very carefully in the documentation department. Any involved person who wishes to examine our Production Book of records of estimates and costs may ask the Production Manager to go over it.

B. We cannot afford to alienate vendors and then try to find a new one every time. In the trade, this is called "printer hopping." One good way to alienate vendors is to let them go to great lengths to accommodate us on a small order, and then fail to give them the follow-up large order. The word gets around. The best way to operate is in a mutually beneficial mode.

APPENDIX D

FURTHER SOURCES AND REFERENCES

Appendix D contains an annotated list of sources and references (books, magazines, and catalogs) that may be useful to you. Some of these references have been referred to in this guide.

Computers

McWilliams, Peter A. *The Word Processing Book; A Short Course in Computer Literacy.* Los Angeles: Prelude Press, 1982.

McWilliams, Peter A. *The Personal Computer Book.* Los Angeles: Prelude Press, 1982.

APPENDIX D 178

These two books are wonderfully readable introductions to computers and word processing. They assume no technical knowledge on the part of the reader. The pictures alone are worth the price of admission.

Creative Computing.
Personal Computing.
Popular Computing.

These magazines, usually sold in grocery stores, drug stores, and computer stores, are written in clear informal English (rather than technical jargon). They answer all kinds of questions, review new software and hardware, and explain a number of issues from the user viewpoint.

Byte; The Small Systems Journal.

This magazine is much more technical than the previous ones, but it is full of accurate information for the writer who is interested in the latest developments. Its style has moved recently towards a more popular, less technical, approach.

Documentation

Words Into Type. 3rd ed. Englewood Cliffs, New Jersey: Prentice-Hall, Inc. 1974.

APPENDIX D 179

My choice for a basic style and reference book.

Strunk, William, Jr. and E. B. White. *The Elements of Style.* 3rd ed. New York: Macmillan Publishing Co.,Inc. 1979.

The definitive book on style and clear writing. Every writer should read this classic.

Lipman, Michel, and Russel Joyner. *How to Write Clearly.* San Francisco: International Society for General Semantics, 1979.

A small paperback booklet with some good writing exercises that may help a person who is not a professional writer.

***Technical communication* Journal of The Society for Technical Communication.**

A professional journal that is sent to members of STC. It has book reviews and articles of interest to the professional writer.

Grimm, Susan J. *How to Write Computer Manuals for Users.* Belmont, California: Lifetime Learning Publications, 1982.

APPENDIX D 180

This book describes in detail all the steps in preparing a manual from start to finish. The style is a little technical, with decimal numbered paragraphs and lots of flow charts.

***The Technology of Text; Principles for Structuring, Designing, and Displaying Text,* ed. David H. Jonassen. Englewood Cliffs, New Jersey: Educational Technology Publications, 1982.**

This is a book about, as its preface states, "the technology of sequencing, structuring, designing, and laying-out of the printed page." A very theoretical treatment written in heavy jargon, but fascinating to those who enjoy an excess of scholarship.

O'Rourke, John. *Writing for the Reader.* Maynard, Massachusetts: Digital Equipment Corporation, 1976.

An excellent small handbook on technical writing. Good training for the beginner, and good reminders for the experienced writer. Concise and clear.

***Graphic Art Materials Reference Manual.* Paramus, New Jersey: Letraset, 1981.**

Not only is this a catalog for clip and rub-on art, but it is also full of useful information and ideas.

APPENDIX D 181

Instructional Design

Roueche, John E. and Herrscher, Barton R. *Toward Instructional Accountability, A Practical Guide to Educational Change.* Palo Alto, California: Westinghouse Learning Press, 1973.

This book provides an excellent way to learn about the practice of individualized instruction.

Bruner, Jerome S. *Toward a Theory of Instruction.* New York: W. W. Norton & Company, Inc., 1966.

A truly inspiring book about the nature of learning and instruction from a theoretical viewpoint.

Time Management

Bliss, Edwin C. *Getting Things Done.* New York: Bantam Books, Inc. 1976.

A practical and amusing guide to increasing your efficiency.

INDEX 183

INDEX

C

INDEX

INDEX

INDEX

INDEX

INDEX

INDEX

INDEX

About the Author

Lucia McKay is a Mathematics graduate from the University of Texas at Austin where she also earned an M.A. in English and a Ph.D. in Curriculum and Instruction. She has extensive experience writing and supervising documentation projects and specializes in interpreting technical material for general use. Ms. McKay has published numerous articles on mathematics, education, and computers, as well as a book of poetry.

About the Book

SoftWords HardWords is a practical how-to guide describing the elements of writing computer software and hardware documentation. Never before has there been such a clear and simple approach to this much-neglected — but ever more important — aspect of computer instruction. The author writes directly from experience, using examples and illustrations to help demystify the art of explaining new technology to novice users.

For techies writing their own documentation, this book will show how a good manual can help sell software. For writers just getting into technical writing, this book explains how to avoid the pitfalls of developing documentation and how to do it faster and better. *SoftWords, HardWords* also features a section on software for writers — a real aid in choosing the proper tools for a particular job.

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