
AUDIO UPDATE



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Documentation difficulties

THE OTHER DAY I HEARD A STEREO-equipment dealer tell a customer that if he found the "documentation" for some of his just-bought audio components unclear, he, the dealer, stood ready to answer any questions that might arise. For me, that raises two matters worth discussing: When did audio instruction manuals become "documents?" And, more important, why did the dealer *expect* the documents/manuals to be unclear? The use of the term "documentation" is, of course, simply another minor example of the kind of jargon that puts roadblocks in the path of communication. Lord knows, stereo technology is difficult enough to explain without injecting computerese.

Because the technology is both difficult to understand and rapidly evolving, one might imagine that manufacturers would make special efforts to provide clearly written, well-illustrated instruction manuals. A clear, attractive, and interesting manual not only enhances the customer's pride of ownership in his equipment, but could do much to eliminate those after-sale phone calls from customers confused about one or more of the operating features on their new components.

The source of the problem

Of course, there are some manufacturers whose instructions are all that any one could ask. But why are so many manuals so incomplete, so strangely worded, and, in general, so inadequate? Almost all of the problem occurs because most of audio equipment sold in the U.S. is not only made,

but also written about in the Orient. (I say *almost* all, because for more than a year one U.S. manufacturer of a very sophisticated and complex preamplifier provided an "instruction manual" that consisted of a thick photo-offset copy of a typed transcript of someone's free-association musings on the product.)

But even when the products come from overseas, aren't their manuals written, or at least edited, by someone with at least some talent for communicating technical instructions in English to a non-technical audience? Sometimes, but certainly not always. I suspect that many U.S. importers are so pleased to get *any* printed material along with the product that they are not about to complain about such "trivial" matters as clarity, accuracy, or prose style! The following are two true, illustrative, personal anecdotes:

Case 1. I once received a frantic call from an audio sales manager surrounded by samples of his new line. They had arrived the day before completely devoid of any descriptive literature. His problem was that he needed to get some fast printed material out to his sales representatives, but he wasn't sure that he fully understood the features and characteristics of the products that the Japanese had chosen to ship to him. My job, if I cared to accept it, was to go over each product and dictate into a recorder as much as I could deduce about its specifications, features, and functions.

Obviously, that was a worst-case situation, but it's not at all uncommon for a U.S. subsidiary or im-

porter (or advertising agency) to be presented with a line of new products said to have "special design features" that, at best, are far from self-explanatory, and, at worse, make no sense at all. Which brings us to:

Case 2. I was asked by the U.S. sales manager of a respected high-end Japanese audio line to produce a technical "white paper" explaining a new "revolutionary" (aren't they all?) amplifier circuit used in this year's products. After studying the schematics and the quasi-English technical gobbledegook that purported to describe the new circuit—let's call it Gamma-Plus—and its purpose, I generated about 1,500 words of what I hoped were plausible explanation and justification. I ran them by the company's U.S. technical consultant who admitted to being no wiser than I about the absolute technical truth of the matter, but who thought my guesses about the operation and purpose of Gamma-Plus were as good as any he had yet heard.

I submitted my white paper, it was accepted and subsequently became part of the press kit to be given out at the press conference—which I was scheduled to attend—where the Japanese president and chief engineer would introduce the new Gamma-Plus line. During the question and answer part of the conference I tried to get an authoritative explanation of Gamma-Plus from the company's chief engineer. In reply to my questions, he assured me that there was an "excellent explanation in the press kit"—thus
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bringing the matter full circle. Needless to say, I'm still not absolutely sure what Gamma-Plus was supposed to accomplish.

Skewed priorities

I could provide other examples of the very low priority that many audio companies place on clear, accurate, and timely communications. Their *high* priority is usually on promoting their annual special technical gimmick—such as Gamma-Plus. Next year, Gamma-Plus is likely to be forgotten in favor of, say, a revolutionary “Lateral-Feedback circuit that prevents signal side-slip, a newly discovered source of semi-audible distortion.” And it isn't just instruction manuals that suffer from the original manufacturers' skewed priorities. Many of the illiteracies and silliness seen in the ads and promotional literature arise from the same problem. The equipment is

obviously designed by talented professionals—so why do the manuals so often appear to be the work of incompetent amateurs?

There's no single answer to that question. Incompetent engineers don't last long, but incompetent technical copywriters apparently go on forever. Too many Far-Eastern manufacturers have on-staff technical writers who, on one hand, are overly dependent on “The Concise Japanese-English Dictionary”, and on the other, are too prose-proud to accept criticism. The U.S. subsidiaries are then stuck with whatever their parent companies supply.

If anyone thinks I'm exaggerating the instruction manual problem, all they need do is interview a batch of customers who have recently bought new and/or more-complex components. Or read the mail that comes in to any of the major hi-fi magazines. Much of the mail is from readers seeking information on matters that should have been explained in the instructions that accompanied their

new equipment. It's obvious that overseas manufacturers (and some from right here at home) should pay closer attention to their manuals. Perhaps the only way that will come about is if they are deluged by complaints. If a newly bought component seems impossible to hook up with the instructions provided, don't assume that *you* are to blame. **R-E**

COMPUTER CONNECTIONS

That dirty dog—the "D" word.

JEFF HOLTZMAN

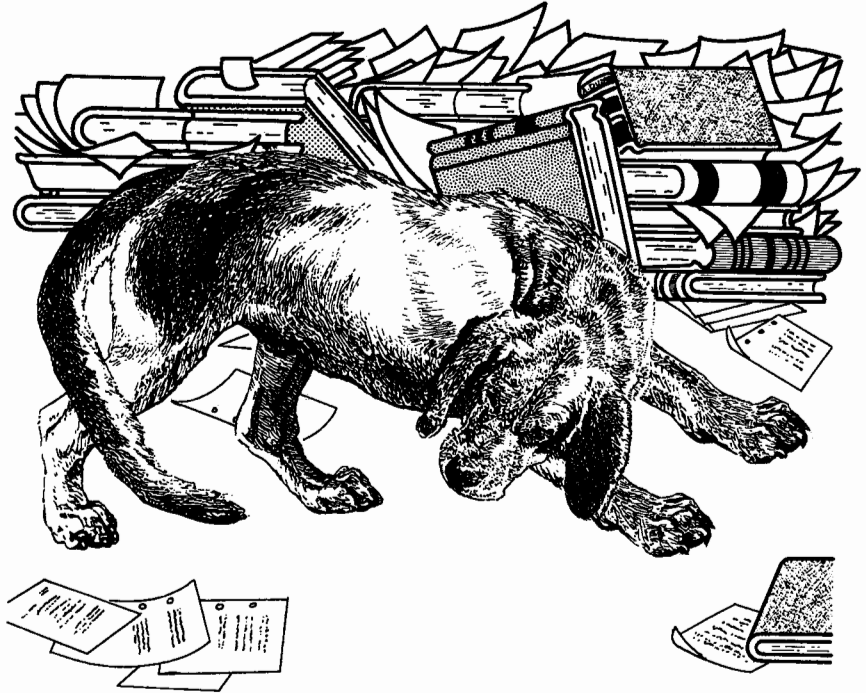
You might have heard comedian George Carlin's comedy skit about the seven unmentionable words of the English language. In the computer industry, there is a different list. The first item on it is (shhh!) the "D" word, *Documentation*.

Almost everyone hates documentation. First and foremost, users hate it because it is usually so woefully inadequate. Vendors hate it because it's expensive to produce and adds little value to their products, except as a way of meeting packaging needs and gratifying users' desires for what they *think* they are entitled to. Engineers hate documentation because it takes them away from what they love best. Those who produce the stuff are sometimes called technical writers. Ironically, the typical member of this species is seldom very technical nor much of a writer. Technical writers don't love the stuff they produce either. Production seems to be accompanied by a fatalistic nobody's-going-to-read-it-anyway attitude. I know of no technical writer whose ambition it was, when they were young, to grow up and be a technical writer. On the other hand, I know of many engineers whose ambition it was to grow up and be an engineer.

Don't get me wrong; some of my very best friends are technical writers. In addition, among other things, I am a technical writer (although in a broader sense than just a documentor of computer products).

These remarks might lead you to think that I believe that technical writers are the root cause of the sorry state of computer documentation—but that is not the case. Even when conscientious people do their best and still produce inadequate results, one should look elsewhere for the cause. The first place one might look is the "profession" itself.

- The technical writing "profession" has no standards, no



THE DOCUMENTATION DOG continues to chase its tail as users clamor for more and vendors seek ways to cut costs.

qualifications, and no way of demonstrating proficiency, so anybody who want's to can call him or herself a technical writer and get away with it. It's kind of like being a "financial advisor" or a palm reader.

- The "profession" lacks methodology. If I were to ask you to reduce a fraction, divide two numbers, or sort a list, you can select one of several methods (algorithms) for doing so. If I ask a technical writer to write a computer manual, he or she won't know where to begin. Yes, there will be some comments about task-orientated writing, breaking text into easily digestible chunks, and designing pages that are easy to scan—but these are a far cry from a *method*.

- The technical writing "profession" lacks proper tools. Today's ultra super whiz-bang WYSIWYG word processors—with changeable fonts, multiple colors, and desktop publishing capabilities—are all gar-

bage. They're fancy typewriters designed for typists.

It's not the writer

Let's ignore the writing profession for a moment and concentrate on the individuals who participate in it. Suppose, for the sake of argument, that a true technical writer existed, someone who could both understand the technology he or she was writing about, and could communicate those ideas clearly, concisely, economically, and perhaps even elegantly. Could this person produce acceptable technical documentation?

The answer is no. Why? Because the intended user wouldn't know how to read it.

What? The problem with documentation is not the writer but the reader? Wasn't I just implying that the technical writer is the problem?

I've thought about the trouble with technical writers a lot. I've read

quite a bit on the subject. I've practiced it off and on for more than fifteen years. I've talked to other practitioners and researchers. And I've had some research in this area published myself.

Over and over I kept asking, "What's the best way to present information?" Nobody knew. Nobody had a simple, unequivocal answer. Meanwhile, the answer had been staring me in the face all along. It's that people are intellectually lazy—and perhaps afraid. They don't want to know how things work; they only want to know how to use them. The concept is best explained by example.

The toaster model

Once upon a time there was a person with a broken toaster. It toasted only the lower half of the bread, and the owner required evenly toasted bread. To meet that requirement, the owner had several choices.

- Throw the toaster away and buy a new one.
- Fix the toaster himself.
- Pay to have it fixed by a knowledgeable technician.
- Find a way to work around the problem.

The owner did not know anything about resistance heating, alternating current, or Philips-head screws, hence he chose the last alternative. In attempting to remedy the problem, the owner first tried extending the length of time the bread remained in the toaster. This worked to some extent, but had the unfortunate side effect of burning the lower half of the slice. Then the owner hit on a mildly ingenious solution: After toasting one half of the slice, pop it out, turn it over, then stick it back in and toast the other side. However, this operation was too arduous and took too much time. So he simply threw the toaster out and bought another.

Obviously, this person was not a toaster engineer or technician who understood how toasters work. Rather, he treated the toaster as a black box that merely provided desired results.

Like toaster users, most computer users don't want to know what's inside the black box; they're only

interested in results. Even people who are experts in some aspect of computer technology exhibit this response. There are so many tools, and they're all so complex, that no one can master them all.

Further compounding the problem is that product developers cannot anticipate all the intended uses of their black boxes. That is why most complex products go through beta testing. In essence, the end user becomes part of the development organization; his or her job is to try out program features and functions in various combinations and permutations. The producer hopes to find bugs before a product is released to the market. Some companies (the honest ones) go through formal beta programs; others depend on the first or second general (i.e., revenue-producing) release of a product.

The challenge for readers

So the challenge for the technical writer becomes one of writing down all possible applications for a given product, when by definition, doing so is impossible.

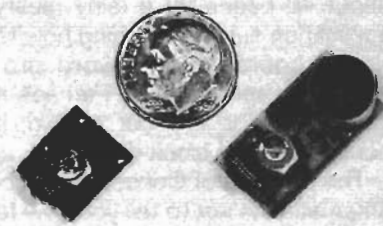
As an example of the phenomenon, consider the rash of computer books on the market with titles like "1001 Tips for Using X." Everywhere you turn there are volumes of what is essentially trivia. The appeal of this kind of "documentation" is that it's painless (intellectually easy) to scan through that kind of minutiae. However, there are many drawbacks with the approach.

- What if you want to perform a specific task that's not covered by the documentation?
- What if you know a product can do something, but you don't know how to do it, and don't know what it's called? Then you're dependent on the imagination of the creators of the documentation's index. Failing that, you're reduced to a random or linear search through the mountains of documentation.
- Most people tend to perpetuate existing ways of doing things rather than finding new, more efficient ways. It is only in the search for more efficient methods that computer science shows its worth. How do you transition users from the



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tried-and-true but stale to the unproved but challenging?

A solution: CD

I have a proposed solution that I'm tentatively calling Conceptual Documentation. It is not marketing fluff. It is not detailed "how-to." It is not an intimate design-level view of underlying data structures and algorithms. It is certainly not programming code documentation. It is not a list of features and functions. And it is not a rehash of the obvious features of the user interface ("To open a file, choose Open from the File menu...").

It's more like a high-level design document. It provides a conceptual model of the tool and the objects upon which it operates. It is short—about 40 pages for a fairly meaty application such as learning how to use a contemporary word processor or spreadsheet. Perhaps it can be read in an hour or two; it contains lots of block diagrams.

The purpose of Conceptual Documentation is not to tell you how to operate the toaster. The purpose is to give you a conceptual understanding of how something works so that you can figure out how to operate it yourself. If you can figure it out, it is a good product, and it is well-documented. If you can't, either the document is poor, the product design—not implementation—is poor, or both.

As an example, the conceptual documentation for a hypothetical word processor might read as follows: "The basic unit is the page, which may (or may not) correspond to an actual printed page. A page can contain one or more objects. An object can be a bit-map graphic, a vector graphic, or a unit of text.

Text is treated as a stream that can flow from page to page in contiguous or noncontiguous blocks. Multiple streams of text can appear on one page. The same stream can appear on multiple pages. The stream of text consists of textual objects in size ranging from one character to an upper limit determined by system resources. A text object can have the following attributes: font, point size, style, line spacing, absolute text placement, prior object, next object..."

That might sound abstract; indeed, it is. The irony is that, whether you know it or not, a similar conceptual model is built of every tool we use. With simple tools, it's easy to predict behavior; intelligent humans do so instinctively. For example, under normal circumstances one would not use a surgical scalpel to chop wood, nor a pipe wrench to adjust a wrist watch. But when it comes to computer tools, both equally preposterous scenarios are commonplace.

Every user of every computer program ever written creates some sort of model in his own mind, usually subconsciously, in an effort to understand how to use the program. The difficulty with a subconsciously developed model is that it is probably inaccurate, perhaps wildly so. That makes it difficult to predict the behavior of the program accurately. It also makes it difficult to determine how to do something original, especially something that isn't already documented. This situation is further complicated if the documentation for it cannot be located. Thus, experience and memory become substitutes for reasoning. As a result, software developers spend as much time, if not more, on live, interactive help than on written and on-line documentation.

Conclusion

I believe that Conceptual Documentation could help some computer users. That user typically accepts responsibility for the tools he or she uses. That user doesn't just want a black box that turns white bread into golden brown toast. The difficulty, obviously, is that most users do not behave that way. They're not interested in how things work. "Don't bore me with a lot of high-falutin' concepts; just tell me how to solve my problem, quickly!"

Therefore, the difficulty with documentation is a social response. If emphasis continues to be placed on short-term results rather than real understanding, the documentation dog is doomed to continue chasing its tail and it will wonder why it's not getting anywhere. The irony here is that users complain about poor documentation. But if they were given

what they really need, they wouldn't use it because it would require study and thought.

My plea to vendors of high-technology products: Conceptual Documentation would be a relatively inexpensive add-on. It would be useful for tech-support staffs (including both your own and those of your large corporate accounts), integrators, and consultants. Moreover, some end users might appreciate it as well. I know I would.

I think that we would all be much better off if documentation simply explained the function of each tool in general. Then it would be up to the user of the software to figure out for himself how those tools could best be used to suit his needs. In the same way that a skilled carpenter rarely misses the head of a nail with his hammer—and never smashes his thumb—the software user would become more and more skilled at using his tools to get jobs done more efficiently.

If you know of a magic solution to the shortcomings of technical documentation I've overlooked, or have a strong feelings either way, E-mail me at jkh@acm.org. Ω

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