turned wrong? (Mine has been turned wrong since grade school, when we faced east and our maps faced north.) I'm always readjusting my senses.
— *Patty Kranz, Richland, WA*

Whew, have you got a chronic case! But let's give it a try, using a method that may work for less long-standing cases and where there isn't an innate problem in orientation.

First, take your desk at home and face it due north. Second, get a big rectangular topographical map of the United States — with as little clutter and detail, including words, as possible. (Certainly nothing cute like pink states and green states and blue states.) Finally, affix the map to the top of your desk, right over the work surface, where you can see it beneath you each time you work. After a few months, replace it with a map of your state and its neighbors, and eventually replace that with a map of your city and its environs.
Parade Magazine, February 24, 1991

cartographic techniques

THE IDEAS OF
NU CARTOMAN

Michael P. Peterson, Fulbright Professor/Freie Universität-Berlin, University of Nebraska-Omaha

The following transcript is of a conversation that is reported to have taken place within a corporation that creates video arcade games. The text may be of interest although it has yet to be verified and its origins are in doubt (suffice it to say that there are numerous spies still living in Berlin). While the discussion seems totally plausible, it should be pointed out that the names of the individuals are somewhat suspicious. Appar-

ently, a new video game is being considered that would use digital maps to contribute to the creation of mental maps. A Mr. Nu Cartoman is attempting to convince his boss, a Mr. Al Dinaro, that the game is worth the investment. Joining the discussion is a Dr. Von Morgen, an outside consultant to the company.

Mr. Al Dinaro: "OK, what's the concept?"
Mr. Nu Cartoman: "It occurred to me that in the process of finding their way through the maze of obstacles that we've built into our video games, children develop some fairly complex mental maps."
Mr. Al Dinaro: "Mental maps?"
Dr. Von Morgen: "Internal representations similar to maps that help us navigate through, or otherwise conceive of, our environment — in this case, through video games that have numerous scenes and a variety of obstacles. Indeed, these mental maps so derived are very complex, often three-dimensional. One could say that the games require a form of spatial thinking and memorization on the part of the youth to which their parents have never been exposed."
Mr. Nu Cartoman: "Right. Anyway, when you consider the complexity of these mental maps, it's astounding what these kids have internalized. But, for what? Stupid games. Just think of the brain cells we're wasting on this stuff!"
Mr. Al Dinaro: "Hey, that's not our problem. We're not forcing these kids to play with these games. Besides, an annual profit of $200 million ain't stupid!"
Dr. Von Morgen: "I wouldn't say it's a waste. Perhaps the children who play these games are required to conceive and memorize spatial representations in a whole new way. One never knows what the outcome of that will be."

Mr. Nu Cartoman: "I can tell you what the outcome is. Mr. Dinaro, do you know that a quarter of the freshman students at the University of Miami can't find the United States on a world map?"
Mr. Al Dinaro: "Like I said, that's not our problem. It's the fault of the school system and I can't do anything to change that!"
Dr. Von Morgen: "We probably all have the obligation to contribute to the education of our youth. Schools are just part of an overall educational process. Anyway, Mr. Cartoman, what do you have in mind? Combining maps with video games?"
Mr. Nu Cartoman: "Exactly! Maps that are stored in digital form are pretty common these days. They require quite of bit of disk space but we can use a fast CD-ROM to store different maps and multiple frame buffers to increase the speed of display. The game would actually put the person in different places and present them with a series of obstacles."
Mr. Al Dinaro: "Maybe blow-up countries or something like that?"
Mr. Nu Cartoman: "Well, that's not what I had in mind. It should be a friendly process. The kids should get the impression that they are going inside a country and walking along a road or a railroad line or through a forest or mountain. We could even store maps of cities and have them play the games in their own neighborhoods, on the streets that they know. Imagine the type of long-term mental maps we would be creating — mental maps that people could use their whole lives."
Mr. Al Dinaro: "You mean we could change the maps so that the units we deliver to Chicago, let's say, have a digital map of Chicago and the game would take place on this map?"
Mr. Nu Cartoman: "Exactly!"
Dr. Von Morgen: "The first

concept you had of 'going inside of countries' is also a worthy one. Certainly, if done properly, maps can provide that feeling. This concept could evolve into a separate product. That would leave room for a game based on a regional map between the world and the city games."

Mr. Nu Cartoman: "Imagine the sense of realism that the children would experience."

Mr. Al Dinaro: "I'm not sure realism is what kids want. Dr. Morgen, would we get a return on our investment? This technology ain't gonna be cheap!"

Dr. Von Morgen: "I would think so. And you can't forget the publicity factor. This would make quite a impression, especially games that are localized to a city or provide the sense of 'opening up' individual countries."

Mr. Al Dinaro: "What about people who make and study maps? What are they called? Aren't they working on more interactive ways of presenting information? Don't they see the potential of the technology? Certainly, they must be conceiving of new ways of presenting information in map form that would dwarf the ideas we have."

Dr. Von Morgen: "You mean 'cartographers.' I don't think you have anything to worry about there. While at one time there was a strong interest by academic cartographers in the process of cartographic communication, that general concern for the map user has disappeared because associated psychophysical empirical research produced few hard results. From what I can tell, maps are now viewed as simply part of a data-base — in a sense, a non-graphical cartography. The results of the empirical work in this area are more difficult to judge and so one simply assumes that it's all leading to something. I have my doubts. They might succeed in helping a few people make maps

better, but where does that leave the rest of us."

Mr. Nu Cartoman: "That's the sense I get. The computer has had a big influence on the construction of maps on paper and this data-base view of maps. It seems that computer technology has been used to make map construction easier but not to improve the quantity or quality of the information that we get from maps, and certainly not to improve our mental maps. I think the concept of a map as a visual medium is fast disappearing. We can capitalize on that."

Dr. Von Morgen: "The level of computer expertise in cartography is also pretty low. The extent of instruction with computers is simply the use of existing programs that have horrible user-interfaces. One or two semesters of instruction will be wasted just to explain the program before the students are able to create a meaningful map. Of course, the pre-occupation with existing programs is destroying any kind of creativity in the discipline. The students are never challenged to explore the potential of the computer for mapping. And, of course, they are not taught the tools to make such exploration fruitful."

Mr. Nu Cartoman: "I would like to stress one final point. We are considering a whole new way of interacting with maps. The user will be able to move through the map, change the scale and perspective. The user will control what is presented and how and it will all be done intuitively as part of the gaming process. Imagine when these people are presented with a printed map? They'll look at it and say: 'What's this supposed to be — some sort of crude representation of the earth? You mean people used to use these things and thought they were getting some useful information?' Then we'll be sitting there with this

technology. The demand for these type of maps will be so great that we'll be able to capitalize on it, perhaps create a spin-off — a whole new company."

Dr. Von Morgen: "Good point! The advantages of this new form of mapping are so great that maps on paper simply can't compete. Most of the rules and practices of traditional map-making will have to be thrown out — they simply won't be valid anymore. People won't want to use maps in the sense that we conceive of them today."

Mr. Al Dinaro: "You mean there might be more money in it in 5 or 10 years? Something really big."

Dr. Von Morgen: "Yes, I believe, something really big."

OCEAN VIDEO

Unlike MTV (music television), F-TV (fish television) won't be there for your kids. But it will be there for your favorite oceanographer — thanks to Jules Jaffe.

An oceanographer at the University of California at San Diego, Jaffe has gotten $483,000 from the National Science Foundation to create a computer environment that will map the movement of fish and other sealife — anything larger than half an inch — into a three-dimensional, moving image of the marine community. It will consist of sixteen high-frequency sonar units. Their signals, once processed, should produce a computer image that can be electronically rotated to create a three-dimensional display of fish going about their business — kind of like an underwater C-SPAN.

Until now, biologists have lacked sophisticated instruments for mapping ocean fish populations. They have had to rely on "towing nets around," says Jaffe, a technique that only reveals the amount of biomass in a given volume of ocean water. In contrast

F-TV will allow marine biologists for the first time to view the ocean "as scientists view land with a pair of binoculars."

Eventually, Jaffe hopes F-TV will help marine researchers understand how pollution and natural environmental changes alter the dynamics of marine populations. He's developed a prototype system in a 5,000 gallon fish tank at UCSD and hopes with two years to deploy and test the system at sea.
Briefings, August 1990

BAD FORM

For some it is not a great leap from concern for the utility of maps to a similar concern for visual information in general. The following piece suggests that the design of forms (printed documents with blank spaces for the insertion of requested information) is a problem that demands informed attention.

A pair of researchers just made it official: Americans are being buried beneath an avalanche of poorly designed and often inscrutable forms, letters and notices. The worst offenders? In many cases the government.

"People are being tortured by forms that are written in a language you cannot understand and presented in a way you cannot comprehend," says Carolyn Boccella Bagin, director of the nonprofit Document Design Center at the American institutes for Research in Washington. "It is a plague."

Bagin and colleague Andrew Rose did a simple survey. They asked the readers of *Modern Maturity* magazine to send in their worst forms and notices. "We were overwhelmed by the response," Bagin says. More than 3,800 readers responded.

Because the readers of *Modern Maturity* tend to be senior citizens, Bagin and Rose received thou-

sands of inscrutable medical forms from hospitals, doctors and commercial insurers. Medicare forms and notices seemed to bring *Modern Maturity* readers to their knees.

Bagin and Rose were also inundated with computer-generated notices and forms mailed by the Social Security Administration and Department of Veterans Affairs, plus assorted phone bills, loan applications, credit card statements, pension amendments and the odd prescription drug warning.

The problems came in all shapes and sizes. A voter registration form containing printed instructions in tiny 4-point type. A notice from the Postal Service, giving postal rates, is in even tinier 3-point type. Very efficient.

Computers seem especially fond of generating letters in all capital letters in single spaced lines that run completely across a page, making reading — let alone comprehension — difficult. Many forms, especially health insurance forms, were printed in green ink on green paper. Or blue ink on blue paper. "Impossible, even in good light, to read," Bagin says.

A credit card application asks — fairly — for credit history. But an applicant is required to supply the name of his or her bank, its address, its phone number and the respondent's bank account number. The space available? A box measuring 1.2 inches by 0.1 inches.

"At first it was funny," Bagin says of the findings, "then it started to seem horrifying." She says some people may get two or three bad notices and forms a week. One woman responded that she received 13 letters from Medicare in one day. "Some people actually try to read and understand this stuff," Bagin says.

Respondents said bad forms made them feel frustrated, confused, angry and intimidated. Many thoughts themselves to

blame. Some failed to file insurance claims because they were too complicated. A few put off needed medical care for fear of the paperwork.

Bagin argues that bad forms cost the taxpayer and business. The Association of Human Resource Development in New York estimates that 28 percent of clerical staff time is wasted due to bad forms.
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cart lab bulletin board

This forum is offered to encourage communication among practitioners at a time of rapid technological transition. Questions, comments, and announcements are invited.

MANIPULATING *MAPMAKER* MAPS IN *FREEHAND 3.0*
David DiBiase, Penn State

Say you've mapped U.S. population density by county with *MapMaker*. Now you wish to export the map to a PostScript-based illustration package to customize it and generate process color separations for printing. Aldus *FreeHand* will open a PICT-format file generated by *MapMaker*. But how do you replace *MapMaker's* pattern fills with process color specifications without selecting, ungrouping and editing thousands of closed paths one by one? This note describes a way to edit *MapMaker* fill patterns globally in *FreeHand 3.0*.

In *MapMaker:*
1. Assign a unique black-and-white fill pattern to each data division. Leave no blank (white) categories.

2. In the Map Display Options dialogue box, set **Draw Boundaries As:** to **Polygons**. This is how you get closed (fillable)