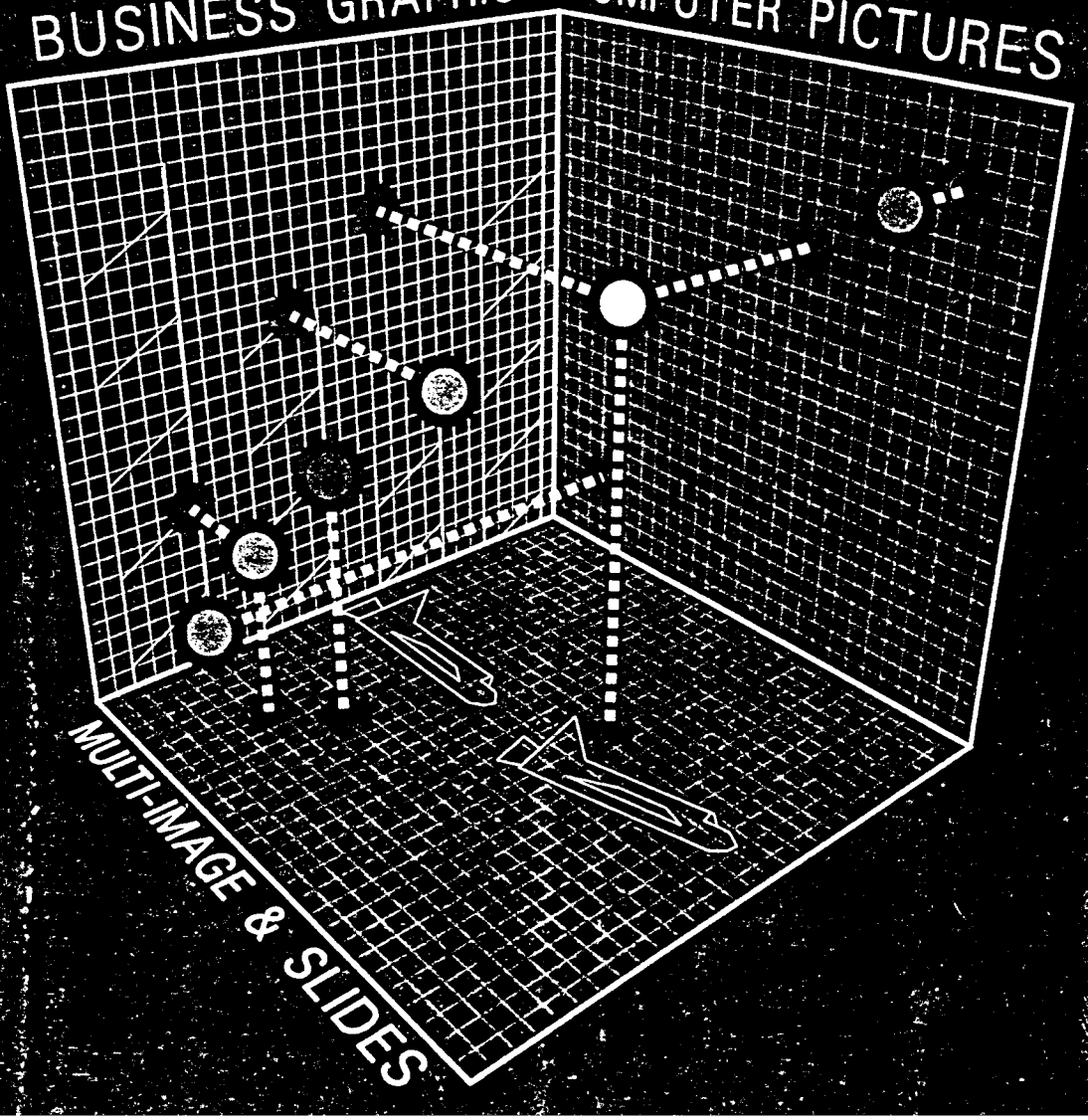
BUSINESS SCREEN

In Two Sections - 2 Magazine Supplement

June/July 1982

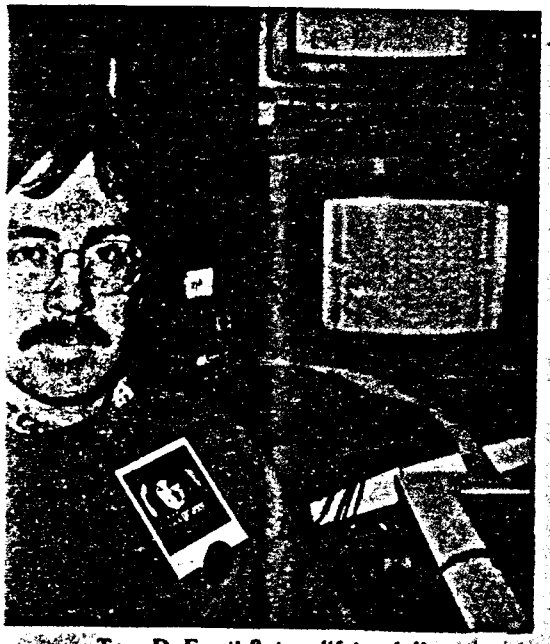
- In the Mind of Zgrass
- Are Designers Afraid of Computers
- 80s Business of Business Graphics
- Multi-Image Environment
- Buyers Guide to Computer Slides
- Graphics at Thames TV

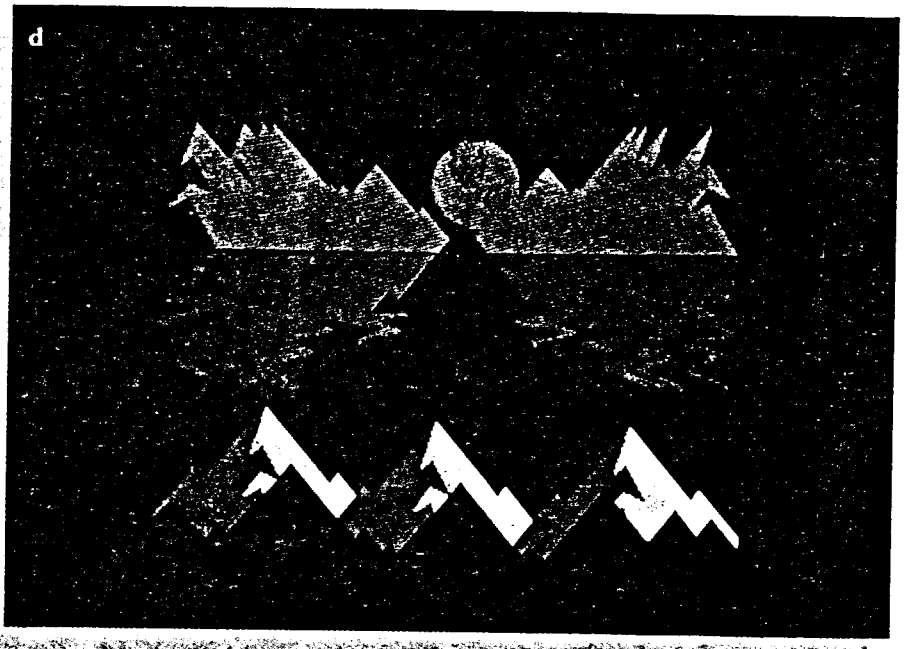


These examples of work done in Z-Grass were turned out by Real Time Design Consultants: a) Copper Giloth, b) Jane Veeder, c) Guenther Tetz, d) Jane Veeder

In the Mind of Tom DeFanti. . . Inventor of Z-Grass

by Suzan D. Prince





Tom DeFanti & two "friends"—

It all started in a computer graphics lab at Ohio State University 10 years ago. That's where Tom DeFanti, then a research assistant in the Fine Arts department, planted the first seeds that eventually grew the Grass language—a powerful software development tool that provides graphic animators, artists and other creatives tremendous freedom in illustrating animated films, video games and industrial productions, along with other applications. A brilliant example of the technology's depth can be found in "Star Wars," for which DeFanti and Larry Cuba, friend and associate, authored the striking graphic effects. Several years after Grass, user-friendly Z-Grass evolved and DeFanti's discovery suddenly put a marvelously inexpensive and far-reaching programming language into the hands of the the masses—artists, freelancers, educators, small and one-man production houses, even consumers.

Today, the computerist/artist (Dr. DeFanti holds a Ph.D. in computer and information science from Ohio State) is the president of Real-Time Design, a computer software developer in Chicago. He has served as Chairman of SIGGRAPH for the past two years, and continues to teach at the University of Illinois where he started his career in 1973. For this special issue on computer graphics, DeFanti spoke his mind on the industry at large and, especially, on what the future holds.

BUSINESS SCREEN: *In layman's terms, what is the Grass language—its highlights, fine points and applications?*

TOM DeFANTI: Actually, the Grass language, as it was developed at Ohio State and later at the University of Illinois, was primarily for teaching purposes. It was meant to aid educators and administrators in producing CAI (computer assisted instruction) materials for classroom use.

Grass is a highly interactive system, meaning you can sit down and really work with it, allow it to guide you along a programming route; it is really a teacher in itself. Its main objective is to teach a person how to use it to create applications programs.

The graphics—they're just a bonus; you pack them around everything else. Or like video games—they're all a subset, a spin-off. The unique thing about Grass is that if you're a programmer, you can unravel the language. If you want to, you can dig into it as

continued on page 54

deeply as desired. But if you have absolutely no computer experience, that's fine too. Artists love Grass. They love to use it in paint systems and other interactive devices. They learn quickly to create with it and then they don't want to let go of it.

Programming languages try to give people structure. But in graphics, you don't care about that. In fact, you don't want nearly as much stucture as most test programming aids can provide. Grass gives you just enough structure to enable images to be considered entities. Images are treated as endpoints and vectors, or single points. Picture a needlepoint canvas. After these primitive functions were written, we were careful to encode the language for efficiency and most important, real-time interaction.

BS: *Where did Grass get its roots, so to speak?*

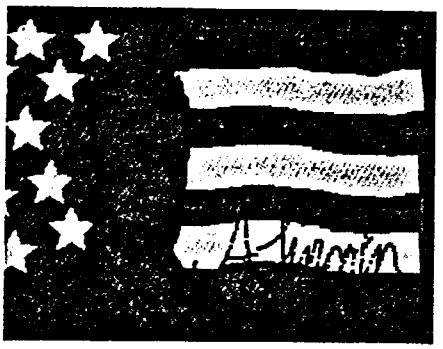
TD: My associates and I studied a number of areas in the process of development. First we looked at BASIC, a currently widely used programming language, especially among beginners and consumer-oriented software producers. But BASIC has poor subroutines, and many restrictions in terms of interactivity. Next we drew upon some sophisticated word processing language—TECO and SNOBALL—which influenced our thoughts to a large extent. But these tools, although extremely powerful, are much too complex for the non-programmer, particularly if a person has developed an affinity for BASIC. So the final product became a language with the 'feel' of BASIC, but without the restrictions.

BS: *What's the difference between Grass and Z-Grass?*

TD: Z-Grass began development through a grant we received from the National Science Foundation in 1976 a few years after I started teaching at the University of Illinois. The grant was to investigate the possibilities of computerized teaching—uncharted territory back then. A big obstacle we faced, however, was lack of equipment to experiment on. Micro-computers had only been available for a few years, and they were mostly hobby kits. The experiments wouldn't be very practical for the classroom if we continued to do them on the lab's $70,000 display oscilloscope; we decided to build our own teaching terminal.

About this time, another friend, Larry Leske, decided he could no longer afford to remain a student at the University and went to work for Bally Manufacturing Co., the games producer. There he discovered the Bally Professional Arcade system, a fully assembled home computer game unit Bally planned to market to the public. Leske started programming on the Arcade, and believe me, he nearly knocked our socks off. Two others—Jay Fenton, a top programmer and developer of Bally BASIC; and Nola Donato, a language progammer—and I, quickly wrote all the code for this new form Leske based on Grass. In 1979 Bally brought out the Arcade and its new software written in Z-Grass.

Actually, about the only similarities between the original and Z-Grass are the user and graphics interaction capabilities. Z-Grass costs a fraction of the price of Grass, and can be displayed on a home TV set. What passed for primitive 3D rotations then (in 1976) has vastly improved to the point where kids are sitting down at home and drawing, painting, sketching on the computer. And 3D drawings are the norm, rather than the exception.



BS: *How does Real-Time Design utilize Z-Grass in the graphics industry?*

TD: Bally left the consumer market in 1980 and the rights to Z-Grass reverted back to us. We began using the program in school and shortly after a company called Astrovision (now Astrocade Inc.) bought the Arcade, renamed it the Astrocade and asked us to continue writing games graphics for it.

For the games, we wired up customer chips, capable of both high- and low-resolution. But we chose to go with higher resolution for better playing effects. For the consumer market, however, we chose lower resolution in four colors for real-time operation. Two years ago Z-Grass became a mature system used by hundreds of students and professionals. A local hardware supplier, Datamax, approached us with the idea that it could build graphics display terminals for the business and industrial user who wanted to run Z-Grass more cheaply than what was on the market. (The Astro Arcade is meant for home entertainment, not for heavy duty production.) Datamax recently came up with an under-$10,000 prototype terminal for teaching and other applications, such as audio visual departments, which will simply add an editor/titler to the system for corporate logos and other materials.

BS: *Granted, computer graphics have become comprehensible to the non-computerist, thanks to Grass and other technologies, but has automation eliminated the 'art' in computer art?*

TD: If you're talking about restrictions imposed on traditional artists through the technology, I'd rather think of this technology, computer graphics, as closer to video production and film making, than to traditional artists' media. Otherwise you're comparing apples and oranges. Now, if you consider computerized graphics as just another technical artists' medium, then no, I don't think creativity has suffered at the hands of the computer. In fact, quite to the contrary, the technology is constantly innovating—at least my staff says they've found it so.

BS: *What about style and design? It appears much of today's work is being over-produced—slick, commercial, and much the same. Whatever happened to individuality?*

TD: I'll agree that the quality of production in the past few years has tended to be overly slick. But fortunately the sparkles and glitters and glows seem to be on the decline. As for individuality, this seems to be more of a problem that lies with the client. He sees what other firms use and decides he wants more than vanilla on vanilla. If the bank across the river has one effect, that's what he must have too. It's the artist's job to use discretion.

BS: *SIGGRAPH—a convention devoted to the graphics industry. What changes, positive or negative, have you witnessed during your 10-year involvment?*

TD: With the help of many involved participants, we have built this meeting from 200 people and a handful of companies into what it has become today: a major industry information exchange. Yet in this age of automated video, and given the progress we've seen in computer graphics and animation, it amazes me that more firms don't make their livelihood from electronic animation—totally, that is.

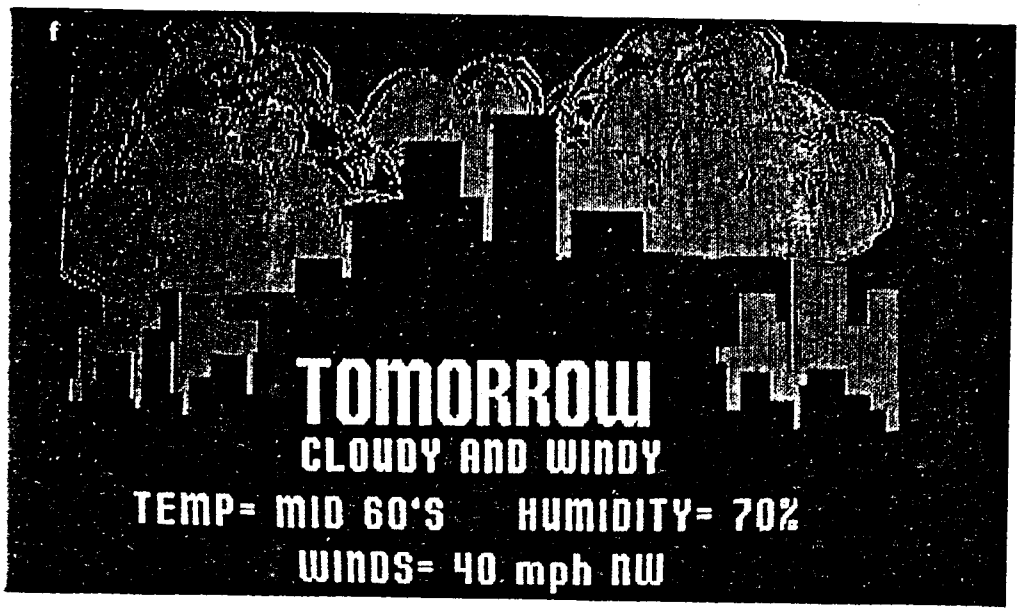
BS: *American graphics production vs. the Japanese—where do we stand in the competition?*

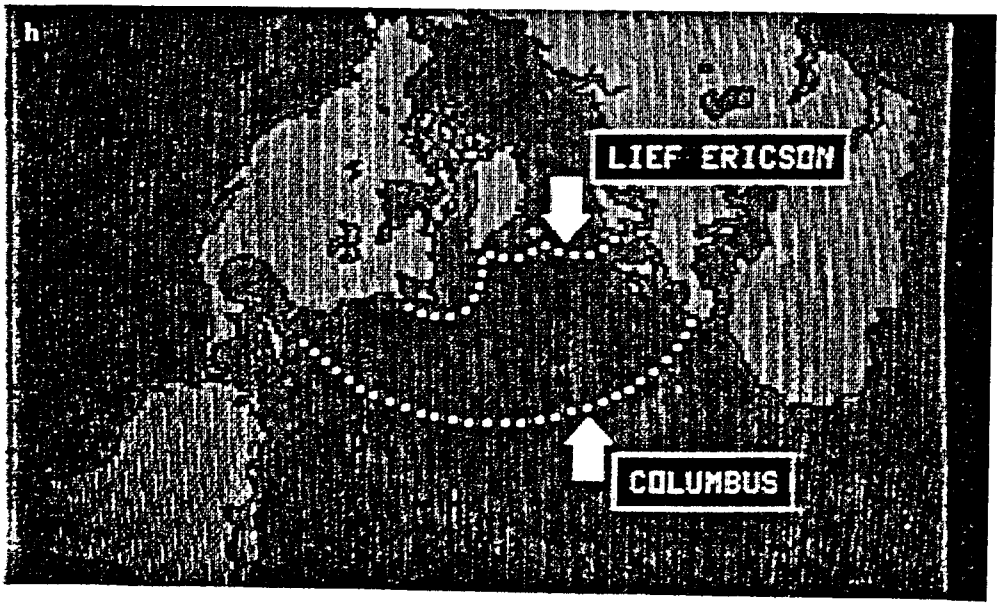
TD: As far as I'm concerned, there is no competition—we're way out in front, despite the immense rivalry. The problem overseas is that the Japanese focus on markets. We focus on technology, then the markets follow naturally. For instance, Grass wasn't developed with any specific application in mind; it could have solved any number of problems. But now it's used all over for any number of reasons.

BS: *But don't we usually send technology chasing after the marketplace—a sometimes reluctant marketplace, at that. Personal computers, for example?*

TD: Now that's a very good point. Certainly, computers have the potential to bore people; after all, you don't see kids dropping quarters into game machines to read text. But we're in business to fix that. That's what animation and graphics are all about—to add excitement and interest to the application.

Technology won't chase the market for long if there are needs to satisfy. Video games, for example, fill a void in the education market, as well as in home entertainment. The technology that made that possible used to cost six times as much. Now mass-produced





e-f-g-h Z-Grass by Jane Veeder

technology is in the hands of users.

BS: *Dr. DeFanti, where does your primary inclination lie—in art or computers?*
TD: My background is in computers, but I'm also an artist. I'd like to think of myself—and the company, which includes about 30 consulting artists and programmers—as developers of technology.

BS: *Where is all of this automation leading? Where are we going and what do you envision down the road for the industry and the technology?*
TD: We're going to see the industrial graphics business lead on from the most unlikely sources. The $5.5 billion video games business, for instance—its revenues now equal the annual ad billings for all three major broadcast networks put together—has a major stake in seeing that future research and development is carried out. New graphic forms are very important to them, so we're going to see most of the r&d money coming from these companies who, in turn, make more money by supporting research.

The technologies continue to get better, and easier and more comprehensible at the user level. Real-Time's philosophy and approach to the market is to move systems out of the door as complete development systems—not just as user-oriented software, but as an outlet for interactive applications. Our reasoning is that you've got to get the system out to people and provide them with tools. We find it's a lot easier to teach an artist how to program than to teach a programmer how to be an artist.

Beyond the Datamax graphics terminal, which should begin shipping in the next few months, Real-Time is working on a new circuit design which will take advantage of some clever tricks and new technology.

BS: *Can you tell us more about this new chip?*
TD: Basically, it's a new custom-integrated circuit that will allow design centers to maintain more control over their work. Our goal is to allow them to create their own technology for specific applications. As a basis for comparison, consider the custom chips produced for Astrocade: there's a dramatic difference between these and the chips found in the Apple. That difference is excitement and living form.

BS: *What else can you tell readers about the project?*
TD: Only that patents are being secured now. When the paperwork is completed, I'll be able to speak more freely.