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Here's a new sci-fi investment tool that makes spotting and tracking securities quicker, easier and more fun.

Cyberspace meets Wall Street

By William G. Flanagan

THE 3-D universe of virtual reality—the computer technology that creates artificial worlds in which to work and play—is coming to Wall Street.

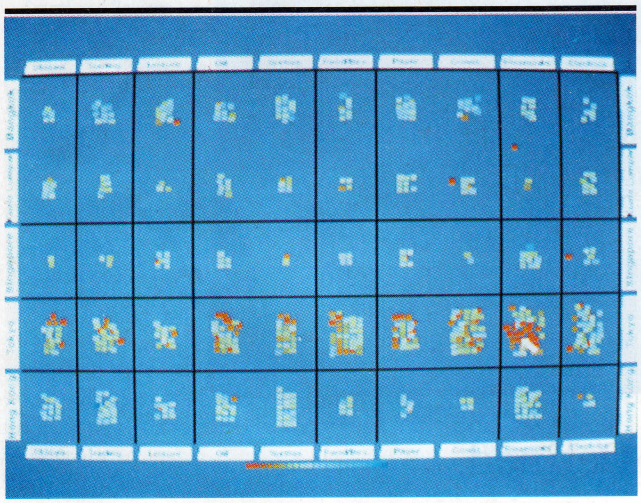
Picture this. You are sitting at your computer screen, looking down at a football field, as if you're sitting in the press box. But you are not stuck there. With your Spaceball control you can fly into the screen—cyberspace—and swoop over, down to, and even through the field below.

But the gridiron below has no players. Instead, it is marked off into rectangles. One side of the grid lists industry groups—financials, utilities, automotive, electricals, paper and pulp, and so on. The other sideline indicates various stock exchanges—Tokyo, Hong Kong, Singapore, Thailand and so on. So Tokyo/financials is one rectangle, and Hong Kong/utilities another.

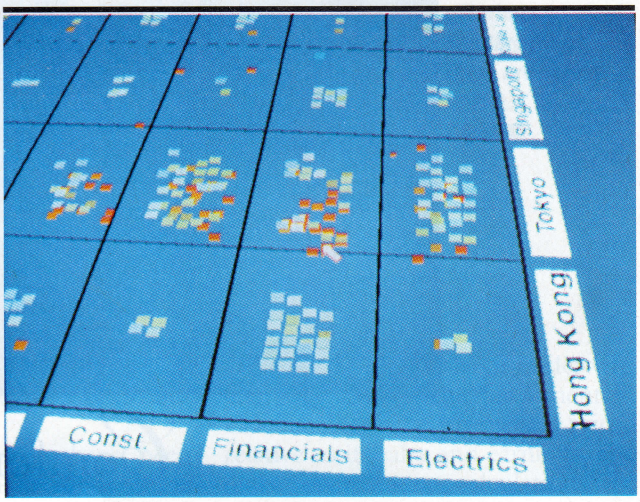
In each rectangle there are small, differently colored chips, some of which are spinning and blinking. Each chip represents a stock in a particular industry group, on a particular exchange, on a particular day. Let's take Apr. 8, 1992, a very, very bad day for the Pacific markets; Tokyo crashed 3.5% that day.

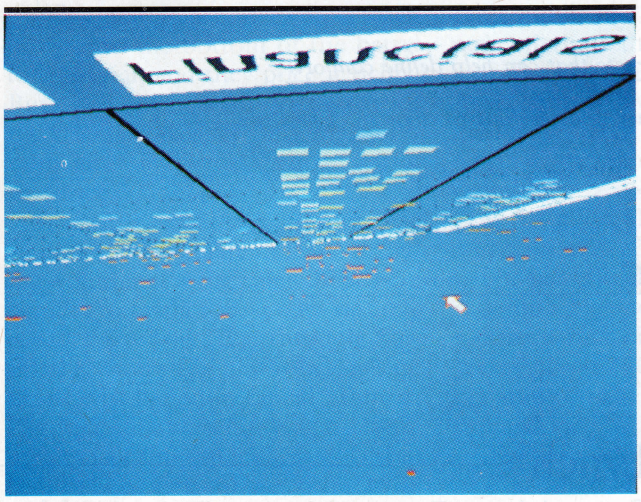
Amid the sea of red chips spread out on the grid below, there's one especially bright one, blinking near the goal line. And over here, near the out-of-bounds marker about midfield, is a bright blue chip that is spinning. All over the field are hundreds of other red, blue, brown and gray chips.

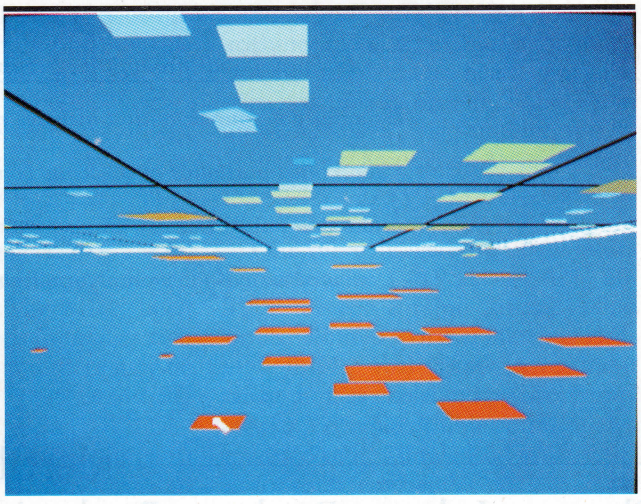
The colors tell you something. Red, for instance, means the stock is down from the day before; blue, that



Steve Borns







the stock is up; gray, only marginally changed. On this Apr. 8, the screen looks like a field of poppies. The movement, if any, tells you something, too. If the chip is spinning, it has very attractive fundamentals, such as a lower price/book or price/earnings than other stocks in its industry. If it is blinking, attractive arbitrage possibilities have cropped up in the security's options or warrants.

Relative position of the chips is important, too. How far below or above the surface of the playing field tells you how far down, or up, that stock is trading relative to other chips.

Say you want to investigate further. Using the Spaceball, a sort of 3-D mouse, you leave your eagle's perch, swoop down from the press box and fly through cyberspace, onto and underneath the grid below. The chips are closer and much larger in size, now, as you narrow your field. You pick that red, blinking chip in the Tokyo/financials rectangle. From beneath the grid you can see that this chip is down more than any other in its sector.

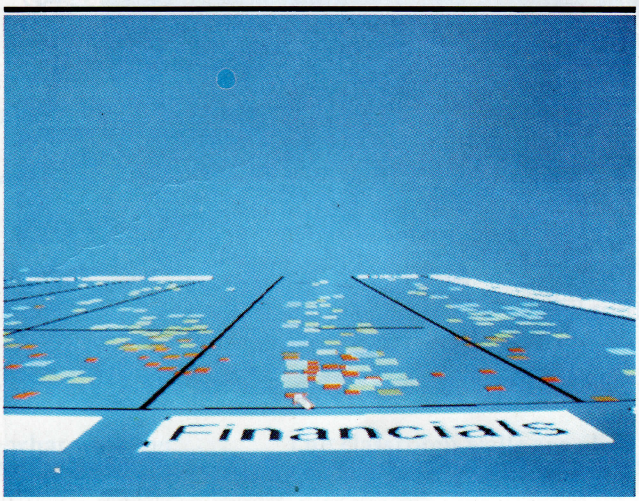
A click of the mouse makes your computer switch gears to conventional characters. The screen tells you the name of the stock and supplies you with particulars. The red chip is Ashikaga Bank, which has dropped an astonishing 15% in a single day.

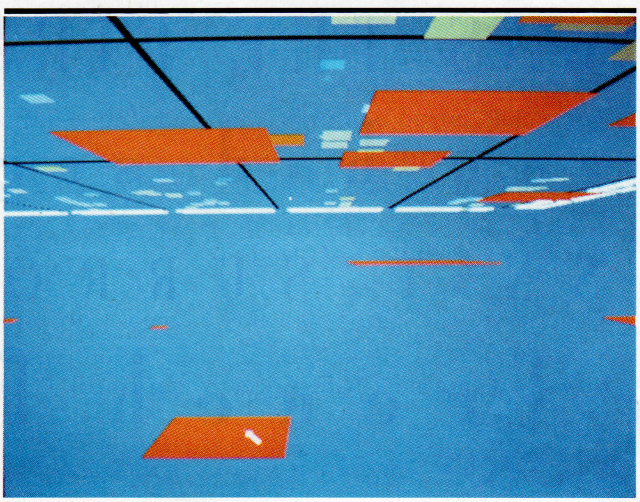
What's going on here? Computer graphics—in this case 3-D graphics—are being used to give you an animated picture of more data than you could ever absorb from a spreadsheet.

The above example is not an experiment; it is now in place at TIAA-CREF, the $106 billion college teachers' pension fund. Money managers there use the system, called Capri, to track Pacific Rim stocks and markets, although other stocks and markets could also be tracked in the same way. In fact, Capri can be designed for any portfolio. And if you don't like the metaphor of a grid with colored, spinning, blinking chips, you can design another one.

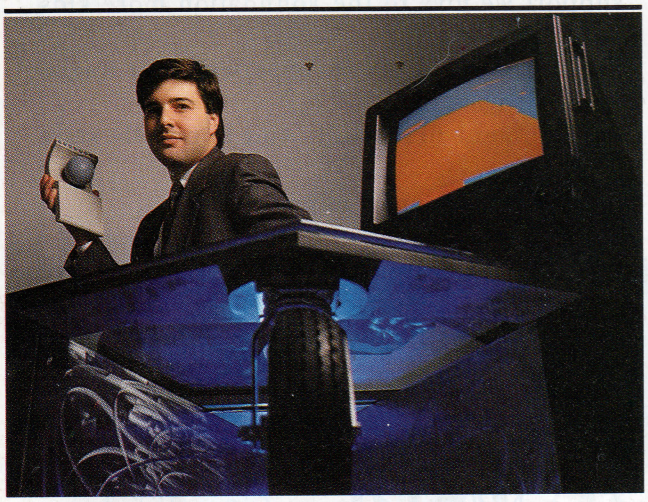
This new world of data visualization is not yet available to the small investor. But, thanks to the rapidly shrinking prices of hardware, the day when it will be available is not far off. Capri runs on a 50-megahertz 486 computer. That's a lot of horsepower by today's desktop standards, but it will be garden-variety within a few years. In the meantime, the individual investor has access to a variety of trading programs that use 3-D visualization and other graphics techniques *(see box, p. 168)*. The concept here is the same as with Capri: to capitalize on the fact that the brain is much better equipped to grasp data presented visually than data presented as numbers and text.

The Capri system is the brainchild of Paul Marshall, 29, executive direc-





Pacific Rim stocks in virtual reality **Each chip is a stock, which you can home in on and identify. This red loser is Ashikaga Bank, Apr. 8, 1992.**



Jonathan Levine

Maxus Systems' Paul Marshall **Using Spaceballs to track stocks through cyberspace.**

tor of Maxus Systems International, a New York-based financial consultant. Marshall discovered the power of graphics in an early TIAA-CREF assignment to help traders sort through Japanese warrants and convertibles. These derivatives can be valuable hedging tools to pension fund managers, but to handle them the trader needs to juggle live price data coming against convertibility formulas and assumptions about volatility for each security.

Instead of seeing rows of numbers, money managers using an early version of Capri got to see colored graphical displays for each security. They looked like aerial photos of alluvial flows, but to the practiced eye they delivered a lot of critical information in a trice.

Marshall then wanted to pack even more information onto the pictures on his computer screen, and to allow managers to fiddle around with that information. Enter a gritty science fiction novel called *Neuromancer,* by William Gibson. This 1984 thriller introduced millions, including Marshall, to the then arcane world of virtual reality. Bells went off. Gibson's computer-generated cyberspace provided all the 3-D elbow room Marshall needed to graphically display the data he wanted. And what's more, it created an artificial world that could be cruised through and manipulated by money managers.

Late last year Marshall went to Sausalito, Calif. to visit Sens8 Corp., a young software company that makes and markets WordToolKit—a library of C language routines that programmers use to create customized virtual reality environments. After a few months of sweating, and with the help of the folks at Sens8, Marshall had the Capri virtual reality system up and running.

How effective is it? Like any tool, only as good as the skills of its operator. But in the right hands it gives a good money manager an edge in interpreting and manipulating investment information. Marshall is now exploring ways to market the system elsewhere on Wall Street.

He's got to work quickly. A technological edge in investing doesn't last very long these days. ■

Visual investing

IT WILL BE a while before virtual reality reaches the ordinary investor's personal computer. But already there are off-the-shelf programs that use graphics and color to give the investor a lot of information at a glance. Here are three hot items—all are aimed at technical traders.

AIQ TradingExpert, from AIQ in Incline Village, Nev., is a dandy program for the trader with a hefty portfolio—and it's priced to match, at $1,000 list. Like low-end computer investment programs *(see following story)*, it charts whatever companies are in your portfolio. It includes an assortment of built-in technical indicators that tell you about relative strength, volume trends and other favorites of chart-watchers.

AIQ allows you to course through past charts and back-test new hypotheses. The charts use color to indicate strength and weakness of securities.

Mesa Co. in Goleta, Calif. has a program called 3D. The program charts five fairly arcane indicators called stochastics, relative strength, moving average convergence and divergence, double moving average and parabolic stop and reverse.

The three-dimensional chart looks like a glacier with humps and mounds, coming right at you. It tells the experienced eye something sheer numbers won't. A smooth patch in the glacier, for example, means that the particular indicator you are looking at—say, a moving average—has little sensitivity to big variations in the market. The program also helps the technical analyst create and fine-tune his theories. Price: $199.

From Traders Insight, in Huntington, N.Y., comes Auto-Candle. It uses so-called Japanese candlestick patterns to chart stock and commodities movements. Candle charting began 200 years ago in the Japanese rice markets. At a glance, it tells you five things about the daily movement of a stock or commodity. The body of the candle represents the open and close for the day. The candle has wicks at both ends, which give the high and low for the day. If the security closed higher than it opened, the body of the candle is left blank; if it closed lower, the body is in color. If you string a bunch of these candles together, certain trading patterns emerge. Auto-Candle spots these patterns for you. Price: $195.

Technical analysis is an occult science that pays more attention to past price changes in a stock than to its present value. It's hard to get rich being a technician, but if you want to try, you might as well have the best equipment. Put away your pencils and graph paper.

–VICKI CONTAVESPI ■