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Compilations

MATRIX COMPILATIONS

The Summer of 1988 is one I'll never forget. It was hot, hot, hot in Boston. It was hot everywhere I was able to go, even up in Labrador where I was on a fact-finding trip to study the habitat of the Atlantic Salmon. In spite of the weather, which should have slowed us all down to a crawl, the pace of change and the news in the fields of digital mapping and computer-aided map publishing increased over the summer and into autumn.

I have a lot to report in this briefing. Each feature, I feel, should be right up on the front page so that you would be sure not to miss something of interest or importance to you. There are some important issues on the pages which follow that may affect your automation decisions. I hope you'll get to them. Some items that I had intended to discuss in this issue of **Compilations** will have to wait until next time. Feel free to call if you would like more information on any of the topics covered.

THE MATRIX PERSPECTIVE

Governments' Influence on Automation: Most European governments restrict the sale of digital geographic data produced by their public mapping agencies. Many countries in Europe won't even consider selling their data or the digitizing rights to their printed maps. Copyrights generally extend to the digital conversion of their printed maps, so it is illegal to digitize these maps without permission and payment of a fee. Their reason: If they sell it, they won't own it anymore. Simple. If they don't have the sole rights to employ this data in products which they create and sell to the public--and other governmental agencies--these map agencies would lose their competitive edge over private map publishers in certain market areas. Compete they do.

The situation in the U.S. is quite different. The U.S. Geological Survey, the U.S. Bureau of the Census, even the Central Intelligence Agency, practically give away their digital databases. Digital Line Graph files, DIME, and soon TIGER files, World Map Data, Landsat, and others are examples of governmental data files distributed to the

public. As far as we know, no copyright laws are violated
if a U.S. governmental map is digitized and the data resold
for profit, or if films are purchased from the U.S.G.S and
reproduced and published. U.S. governmental agencies do not
appear to compete with private map publishers on the
commercial market; their competition is subtle.

These polar opposite approaches, restrictions in Europe and
giveaways in the U.S., have had very different effects on
the current state of automation within their respective map
publishing industries, and on the encouragement of new
business opportunities. Here's how we see it:

     * European governments have encouraged automation among
traditional map publishers. It has been the private sector
leading the way into the development of computer techniques,
not governmental agencies. Only recently have the big
mapping agencies begun to install map publishing systems.
The encouragement has not come in the form of grants or
special financial considerations, but through the promise
that if private companies create digital databases, these
companies would compete with eventual government digital
databases on equal footing. Governments would also contract
for printed maps created by the private sector using
computer-aided map publishing systems.

     * The U.S. government has passively discouraged
automation within the private map publishing industry while
it has invested heavily in database and map publishing
systems for its own uses. Discouragement has come in the
form of disincentives to automate in order to create digital
databases. Why do it if the government has already done it,
or will do it, and is selling the data a bargain basement
rates? Worse still for map publishers, the availability and
low cost of digital geographic data has spawned competition
from start-up companies who repackage the digital data or
use it to produce maps. (These repackagers are what we have
termed Geographic Data Integrators.)

     * The U.S. government has actively discouraged
automation. In 1984, I consulted to a team responding to a
Request for Proposals issued jointly by the U.S.G.S and
Defense Mapping Agency. The scope of work included
digitizing the entire Continental U.S. from 1:24,000
topographical maps, and delivering a Digital Elevation Model
for each quad sheet as well as plate-ready films for a new
1:50,000 series. Of the two teams selected to complete the
pilot project, my client not being one of them, one firm

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went Chapter 11 trying to meet the government's specifications, while the other was late in delivering their products, and apparently lost money on the contract. The project was not continued past the Pilot Project. However, the U.S.G.S. and the DMA will proceed with the work in-house. Many respondents felt that it was their intention from the start to do the work in-house, but were compelled to by government regulations to seek outside bids.

Not a single map publisher bid on that project. Yes, the large engineering firms and digital map conversion service bureaus that did participate had the qualifications and the experience to create the required Digital Elevation Models, and some even employ cartographers for specialized map production. However, the U.S.G.S. wanted printing films of publication-quality maps. This is supposedly what map publishers are qualified to do. It's their business.

We believe that it's time for map publishers in the U.S. to wake up to the mounting threats that face them in the future. There needs to be more cooperative efforts, more communication among map publishers, especially concerning automation. There is presently no channel for such dialogue, no group which represents the interests of map publishers. If you share this belief or want to know more about what has been discussed in this feature, let us know.

TRANSFORMATIONS

Thomas Brothers Making the Transition: I've talked about the need for traditional map producers to become Geographic Data Integrators, or face shrinking markets as more map products are offered in digital form, both by the government and by new companies. Rand McNally, DeLorme Map Company, and now Thomas Brothers Maps all look like they want to lead this transition. Rand opened a subsidiary called Rand Data, which had a short life as a business concept, but which pushed the company into digital mapping. DeLorme (Freeport, ME), is marketing the **World Atlas**, a Personal Computer-based map display system that stores public domain and DeLorme digitized maps on a compact disk.

Thomas Brothers Maps (Irvine, CA), appears to be committed to both digital cartography and digital database development and sales. In 1985, the company installed an **ARC/INFO** system from **Environmental Systems Research Institute**.

Originally, the software was loaded on a Prime Computer 9955 supermini computer and operated from Tektronix workstations. The operating environment has gradually been moved over to a group of networked Sun Microsystems workstations. Halftone screened pages for their street atlases are printed on a Linotronic 300 phototypesetter.

Los Angeles and Orange Counties in Southern California are being stereo digitized from the company's own aerial photography. The nominal scale of the data is 1:24,000. According to Chuck Cone, who has become Product Manager for Digital Map Products, the company decided that commissioning its own aerial photography was the only way it could ensure the high degree of accuracy it desired, while at the same time guaranteeing precise geographic coordinates. Their own manually-produced base material was judged to be unsuitable for digitizing since it lacked geographic accuracy.

Thomas Brothers is investing heavily in its digital conversion efforts. It is betting that there will be a market for its street level data. The company is not alone in this belief. Both Etak and Navigation Technologies will be competing with them in the same market. Thomas Brothers has one big advantage over its competition: While the market for digital products matures, it can use its data for computer-aided map publishing its own maps.

Maps International AB, Stockholm: A new company, Maps International AB, has been formed by three former Esselte Map Service executives. Bo Gramfors, Svante Astermo and Ulla Durvall have joined forces and obtained exclusive rights to market Esselte products and services outside of Scandinavia. It's an exclusive arrangement for both parties; Maps International will not sell other products.

Bo had been with Esselte for thirty years, since the days when Dr. Carl Mannerfelt was managing director of the map publishing unit. (Dr. Mannerfelt is the namesake of the International Cartographic Association's prestigious Mannerfelt Award for distinguished service to the profession.) Bo was director of marketing for ten years and managing director for the past two years. Esselte Map Service has seen its position shrink within the expanding Esselte Group from one of prominence--it was one of the original companies that formed the group early in this century--to one of relative obscurity. It was merged with another Esselte company earlier this year. The spin-off of

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the marketing team will apparently reduce overall operating costs for Esselte, and allow Bo the freedom to do what he does best: <u>sell</u>.

Scitex America Loses Cartographic Staff: Personnel migration within the computer industry is a common occurrence, even at the highest levels of management. Scitex Corporation has experienced more than its share of staff changes during the past few years. Effi Arazi, founder and president of the firm, has passed operational control of the company to Ariel Rosenfeldt, formerly managing director of Scitex Europe. Rosenfeldt now splits his time between Brussels and Scitex headquarters in Herzlia, Israel.

In the U.S., four of Scitex America's applications engineers have moved on: Mike Marion to Eikonix, Lee Alnes and Mike Clesceri to Imagitex, and, most recently, Chuck Cone to Thomas Brothers. The big surprise was the exit of long-time Scitex employee, Dani Herzka. To many Scitex cartographic systems users, both in Europe and in the U.S., Dani was their first contact with the company and the system. He helped to start the Brussels operation as an applications engineer. He moved to the U.S. when Scitex America was opened. He has been manager of sales for Engineering Graphics (cartographic, textile and printed circuit board applications), for several years. Dani has taken a positions with DuPont as Manager of OEM Sales.

At a recent press conference in Birmingham, England at the IPEX Exposition, Ari Rosenfeldt stated that Scitex is now back on strong financial footing, led by the sales of its renovated pre-press systems. Many of us involved with map publishing wonder what this means to the Scitex cartographic systems. Who will replace Dani Herzka as the account representative for carto sales? What will Scitex do for its U.S. users who are without applications support? And how can Scitex hope to sell systems without an infrastructure in place to demonstrate the system's capabilities? Scitex will have an opportunity to answer these questions at the Users Group meetings in Boston (November 7-9), and in Brussels (November 16-18).

Interarts Introduces Wearin' the World: Occasionally, a new map-related consumer product hits the market with mass appeal. A few years ago we saw inflatable globes; last

Christmas season stores were filled with spherical cushions of different sizes--squeezable and kickable globes--that made very popular presents for young and old. Interarts, Ltd (Cambridge, MA) has just begun to market a wearable wall map. It's a jacket made of **DuPont's** ubiquitous **Tyvek** synthetic paper, the same material that is used as a moisture barrier to wrap buildings, and has found countless other applications as a durable, waterproof and virtually indestructible paper substitute.

The **Associated Press** has been purchasing wall maps created by Esselte Map Service and printed on Tyvek for over ten years. Now, Barbara Petersen, president of Interarts, and sister Susan have teamed up to put the same Esselte wall map on your back. The jacket is called **Wearin' the World** (trademarked), a name, Barbara tells us, Susan "invented" the morning after Interart's annual Map Mavens Party at the company's Cambridge office.

The first run of two thousand jackets has sold out in less than two weeks. Barbara says she sold seventeen to one person while she was walking to work wearing the jacket. It's a clever idea. It's also a highly visible advertisement for geography and cartography. Maybe it's even an alternative to the folded tourist map. What about Wearin' Manhattan, or Wearin' London?

To get more information on Wearin' the World, contact:

> Barbara Petersen
> Interarts, Ltd.
> 15 Mount Auburn Street
> Cambridge, MA 02138
> (617) 354-4655

BENCHMARKS

PCs Expand Database Capabilities: It wasn't too long ago--maybe a year at most--that Personal Computers were not a realistic alternative to workstations and minicomputer systems for digital cartographic/geographic database construction. The machines were not fast enough, did not allow the easy sharing of data, and there was little software available for them. Links between PC's and the larger, established mapping and GIS systems were non-existent. There was also virtually no geographic data that

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could be loaded on the systems, and no easy way to build
databases. Things have changed.

In the area of Geographic Information Systems, Environmental
Systems Research Institute's **pc ARC/INFO** looks like it will
be a real winner. It provides many of the same capabilities
available on the company's Workstation ARC/INFO product.
Digitizing, cleaning and building of topology, address
coding, graphics and attribute editing, plotting and other
functions can be performed on the system which runs on IBM
PC/AT or compatible 286 and 386 systems running MS DOS.

Available in eight modules, **pc ARC/INFO** can operate in a
standalone mode, and it is suitable for small operations or
at a remote site. It can also be a node on a network
consisting of workstations or it map be linked to a mini-
based system. The PC product is sold through a distributor
network that is fast becoming worldwide in its coverage.

Of special note is ESRI's signing in July of Geographic Data
Technology, Inc. (Lyme, NH), as a qualified distributor of
pc ARC/INFO. Says GDT in its announcement of the agreement:
"The decision heralds a new direction for GDT, allowing (us)
to offer not only (our) traditional map bases, but also the
software to complete a GIS." The map bases include
Dynamap/USA, street segments and non-street features for
over 300 Standard Metropolitan Statistical Areas, and
Nationwide Boundary Files.

Geographic Data Technology has its own PC-based software.
ZoneRanger/GDT, which matches street addresses with street
segments and territories; **MatchMaker/GDT**, which attaches
latitude and longitude coordinates to addresses; and
HandShake/GDT, a nationwide dealer locator and referral
program.

With its switch of emphasis from a consumer products
developer to a dedicated commercial supplier of digital map
data, **Etak, Inc.** (Menlo Park, CA) has also seen the need to
provide a system, called **Geocoder** (it was originally called
EtakMap/PC when it was announced), to display and manipulate
their data. **Geocoder** operates with data from **MapBase**, a
database created by Etak which contains detailed street
networks, addresses, political and census boundaries.

With the software, a user can type in a street address.
Almost immediately (I saw it work), a street map is
displayed on the screen showing the street and surrounding

area with street labels and color-coded lines to indicate
relative importance of the streets. The geometry, or shape
records, are as detailed as the company's navigation
product. It is sufficient for a wide variety of uses,
including dispatching in Fleet Management applications, and
cartography. Geocoder operates under MS DOS and UNIX
operating systems. Etak is focusing on the UNIX product
running on 386-based computers.

In addition to running Etak's PC system and its in-vehicle
navigation system, **MapBase** can also be licensed for use with
ESRI's pc ARC/INFO. ESRI reports that many of its clients
are using MapBase in their applications, including The Los
Angeles Times, The U.S. Environmental Protection Agency, and
others.

No doubt, the most active developer of PC-based mapping
software is **Strategic Locations Planning** (San Jose, CA).
Stephen L. Poizner, founder and president of SLP, has
pioneered in desktop mapping for decision support
applications. Poizner is now beginning to develop
interfaces between SLP's **Atlas*Graphics** and **Atlas*Draw**
programs to more powerful GIS, mapping and imaging systems.
Terra-Mar Resources Information Services, Inc. (Mountain
View, CA), has opened it system to SLP software users.

More news in the PC to mini/mainframe arena: **GeoVision
Corporation** (Ottawa, Ontario) announced in August that it
now has an interface between its minicomputer-based GIS and
the PC-based spatial analysis software marketed by **TYDAK
Technologies, Inc.** (Ottawa, Ontario). GeoVision and TYDAK
are sister companies owned by Kinburn Corporation.
Intergraph users are beginning to rely on **Bentley Systems
Microstation** for data input and editing. **Synercom** is now
marketing its own PC system. Like ESRI's product, it is a
microversion of its main product offering. **McDonnell
Douglas** has had a PC editing and input system for several
years.

The list of developments in the PC arena is already long and
growing quickly. We haven't even mentioned the programs and
databases available on the Apple Macintosh. What's
important to understand as a current user of digital
geographic database systems, or a potential purchaser of
such systems, is that there are many more options available
today than there were just a few years ago. Those map
publishing firms which invested in minicomputer or
workstation systems one or two years ago to create large,

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detailed databases made the right decision then, and it is still the right decision today. Nevertheless, PC systems have established their presence in mapping database production, and this presence is destined to grow stronger in the future.

Datarepro--Big (PC) News for Map Publishers: "Databases are swell, but I need a map," says the intrepid map publisher. One PC-based system is designed specifically for map publishing output. It was developed by Jan Malm, formerly Production Manager for Esselte Map Service, and his two sons, both computer programmers. Jan, along with Rune Hermansson, formerly Cartographic Manager for Esselte, have a firm called **Swedmap** in Stockholm, Sweden. Since leaving Esselte in 1981, Jan and Rune have sold and produced maps for publication. They have rented time on a score of Scitex computer systems to create street maps, road atlases and geophysical maps. Swedmap is "The little engine that could," and automation has given them the vehicle to compete against much larger firms, including their former employer, Esselte.

For the past seven years, Jan has looked for ways to reduce the time and cost of producing maps with the Scitex system. He moved away from strictly raster processing to scanning and vectorization procedures so that Swedmap could define their own cartographic specifications. Three years ago, Jan saw the opportunity offered by increasingly powerful PC's to transfer many of the processes performed on the Scitex over to the less expensive and faster PC platforms. He defined direct links to the cartographic programs within the Scitex system to reduce the time between vector-to-raster conversion and plotting of screened films. He formed **Datarepro** to create an input and editing workstation for the Scitex system, as well as to write special "batch" programs which run on Scitex.

Jan made three strategic decisions when he and his sons began their development efforts:

1. They decided that digitizing a map over a large table with a cursor is uncomfortable for the operator, and it is difficult to see what has been done or what has been missed. They opted for scanning an image, displaying it on the PC monitor, and digitizing directly over the image.

2. They determined that there were enough PC-based graphics packages available--even then--so there was no need to build their own digitizing system. They selected **AutoCAD** as their base graphics package because it appeared to be on its way to becoming the industry standard. (With over 150,000 authorized copies of AutoCad sold to date, and a more than 50% share of the PC CAD market, it looks like they were right.) They felt that no modifications should be made to AutoCAD so that the user would have a free path to upgrade with the latest improvements made by AutoCAD's developers, Autodesk.

3. Many decisions required for quality map production can only be made when the cartographer sees the vector data expanded into final cartographic specifications with proper line widths and symbolization. They believed that it must be possible to view the final map with, for example, cleared intersections, overpasses and an exact match to final map type, prior to releasing the database from the PC to the Scitex system.

Datarepro has stuck to these decisions and created a cartographer's workstation. Each map component is a named layer in AutoCAD. The selection of the name corresponds to a Line or Symbol "font" in the Scitex system. A program written by Datarepro converts the AutoCAD file into Standard Interchange Format (SIF) and produces a Scitex-compatible magnetic tape. On the Scitex side, an operator loads the tape, starts a series of batch programs, loads an empty tape, and returns after several hours to remove the tape with four files ready for mounting on the Scitex plotter for film exposure.

This system is intended for small map publishers who cannot afford a system like Scitex, but who need to produce film. It is also ideal for existing Scitex cartographic installations where there is a desire to expand the number of cartographers who can compile, input and edit maps. It is not a GIS database system, although it could provide an intermediary link between a GIS system and Scitex. It is not a large database production system; it works best with small segments that are stitched together before conversion or within the Scitex system.

The **Datarepro** system is a <u>map publishing workstation on a PC</u>. It isn't limited to only map geometry. Any artwork that can be drawn with AutoCAD or imported into AutoCAD, such as graphs and charts, can be processed through to film.

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If you would like to learn more about the **Datarepro** system, give us a call at **MATRIX**.

Color Plotting on the Scitex Without Film: Scitex has written software to link their Response 280 system and the **Versatec** color electrostatic plotter. First, a raster file is processed through a program that runs on the R280 which reduces the resolution of the file to a resolution that matches the Versatec. For a 400 DPI plotter, the resolution must be 16 points per millimeter; for a 250 DPI plotter, the resolution must be 8 points per millimeter. Next, the file is transferred from Scitex to an IBM PC AT or compatible computer using a Scitex communications package called **PC/LINK**. At the PC, a program called **ProOfer** allows the user to select screen percentages in yellow, cyan, magenta and black for each of the twelve color channels. ProOfer converts the Scitex raster file into a Versatec plot file.

These programs run well and plotted results provide excellent proofing quality output. However, there are a few problems which potential purchasers of this package need to be aware of. The conversion of Scitex raster to Versatec raster plotting files, which is executed on the PC, takes lots of disk space. A large sheet map (30" x 40") may require up to 25 Mbytes. This means that under MS DOS, which partitions a disk into 30 Mbyte chunks, there can be nothing else but the ProOfer program and utilities on the same partition of the disk as the raster pattern.

Another problem is that PC/LINK does not currently run on a 386/20MHz computer. It will run on a slower 386 machine, but manufacturers, like Compaq, are quickly discontinuing their 16 and even 20MHz computers. Scitex knows about this problem and they have designed a new communications board for the faster 386 machines, but it won't be available before year end.

In Europe, Scitex is developing a link to the **CalComp** color electrostatic plotter. David Nizan, Applications Manager for Cartographic Systems, tells us that he plans to have the interface ready to present to Scitex users in Europe at their annual Users Group meeting in Brussels in November.

For map publishers using the combination R280 and the Scitex R300, pre-press system (e.g., National Geographic and the Swedish Land Survey in Kiruna), a very high resolution, four

color plotter is available from **IRIS Graphics, Inc.**
(Stoneham, MA). Files can be transferred from the 280 to
300 and converted to continuous tone format. The IRIS
plotter simulates four color lithographic printing.

MATRIX Consultants in Automation
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MATRIX Consultants in Automation is a Boston-based,
internationally oriented computer graphics and database
management consulting firm that focuses on the management
issues and technology trends related to the business of map
publishing and geographic information systems.

The firm was founded in 1987 by Michael L. Sena after four
years in private consulting practice and twelve years of
experience in map production and publishing. The goal of
MATRIX is to provide practical, results-oriented solutions
to its clients through the creative and efficient
application and management of automation. Consulting
activities include:

* Project Consulting
* Systems Development
* Database Development
* Contract Research
* Corporate Briefings