

# More about Atex

**Jonathan W. Seybold**

**Editor:**  
David Walden

In the prior anecdote in this issue, Douglas Drane tells his story as a founder of Atex. In the following, Jonathan Seybold places Atex's founding in the context of a revolution in newspaper automation and

also provides his memories of the connection between the Seybold group and Atex.

Then an editor's note provide some less anecdotal details about Atex.

## NEWSPAPER AUTOMATION

By the early 1970s, many reasonably sized businesses were using computers for support functions, especially for accounting, billing, inventory, and so forth. In addition to these functions, newspapers were also using small computers (IBM 1130s and DEC PDP-8s) programmed to perform hyphenation and justification (H&J) to increase productivity in the composing (typesetting) room.

Next, newspapers set out to do something far more ambitious: computerize the entire process of creating and producing their product. The news copy for the newspaper would be written, edited, formatted, and composed on interactive terminals. All of the “copy flow” between writers and editors would take place within the computer system. All classified ads would be taken, priced, and composed on the same system. Ultimately, all display advertising and all page makeup would be done using interactive graphic display terminals. The composing room (and all the union craftsmen who worked there) would be phased out.

To accomplish these goals, the computer system had to provide the following:

- **Highly interactive response times**, even under heavy deadline use (by hundreds of online video display terminal [VDT] users at a large metropolitan paper).
- **Near-instantaneous H&J speed**, again under deadline loads. A newspaper story is written and edited to the exact number of lines allocated for it on the newspaper page. H&J will almost certainly be done multiple times as a story moves through the writing and editing process. Classified ads are priced by the line so they must be H&J'd—and re-H&J'd—while the ad taker is on the phone with the customer.
- **Intuitive user interface** that even the most technophobic writer, editor, or classified ad sales agent could quickly feel comfortable with. The decision about which system to buy was always made by a committee dominated by the people who would be using the system: editors, writers, and classified ad supervisors.

At the time, no available off-the-shelf computer system could meet the necessary requirements.

- **Fail-safe operation.** The paper must go to press at exact times. A newspaper system must be fail-safe and completely redundant. It can never go down. It can never lose copy.

At the time, no available off-the-shelf computer system could meet these requirements. Suppliers had to develop, sell, and support integrated hardware/software packages for newspapers. Almost all were built around minicomputers with additional custom logic cards and custom video terminals—plus, of course, a *lot* of software (which also must never fail).

More than two dozen firms competed in this market. Atex became the dominant supplier. Systems Integrators (which used Tandem computers) became a strong competitor in very large newspapers.

Initially, the focus was on the “heart” of the newspaper: news copy and classified advertising.

As technological advances began to make it possible to build WYSIWYG interactive graphic terminals, companies like Camex, Raytheon, and Xenotron developed interactive systems for display advertisements.

## SEYBOLD CONNECTION TO ATEX

Two of the three Atex founders, Douglas Drane and Charlie Ying, attended an annual National Computer Conference, which was held that year at the New York Hilton. I gave a speech at that conference. After the speech, the two of them pounced on me—a fast-talking guy with a southern accent and his young Chinese companion. We found a quiet corner to talk.

Charlie had worked for Hendrix Electronics, based in Manchester, New Hampshire. Hendrix had developed a newspaper editorial system that used DEC minicomputers to drive dumb VDTs. Hendrix was (tightly) run by Ed Berg. I had been told by employees that the principal investors were other Mormon businessmen from the Boston area.

Doug and Charlie explained what they were setting out to do. I was familiar with the work being done at Hendrix, and it was clear what Doug and Charlie were proposing was going in the same direction, so I was comfortable that this could work.

At the time, my father had been hired as a consultant to *U.S. News & World Report* on an ambitious project to bring production of the magazine in-house. As with most magazines, *U.S. News* typesetting, page makeup, and printing was done by a printer in the Midwest. Magazine employees at the printer oversaw the process. Clearly, this arrangement was complex and time-consuming—not a good thing for a news magazine.

*U.S. News* was unhappy with its printer and had contracted to switch to RR Donnelley. This wasn't going to be a simple matter of switching printers. It was intended to be a complete transformation of how the magazine was produced. They wanted to move all the page production in-house with a complete VDT-based editorial system that would produce fully made up pages that would be transmitted to Information International Videocomp full-page CRT output-typesetters at the printing plant.

This had to be a fail-safe system. Donnelley was going to print *U.S. News* on the same press complex that was used to print *Time* magazine. *Time* had the priority press schedule. *U.S. News* had to be off the press before the *Time* was scheduled to be set up to run. If *U.S. News* was late, it would be bumped off the press and its print run would not be restarted until the *Time* print run had been completed.

My father convinced John Touhey of *U.S. News* to break the plan down into stages:

1. Start with just the production of text pages with photos and illustrations to be stripped in at the printer.
2. Grow this into a full editorial system for writers and editors.
3. Add digital halftone photos and graphics.

Even so, *U.S. News* had not been able to find a company they believed could deliver the system that they needed, let alone deliver it on the time schedule they had to meet. The few companies who had, or were working on, editorial systems were focused on the much larger newspaper market and not interested in diverting resources to accommodating the more demanding typographic needs of magazine publishers—or in adding facilities for doing page makeup of magazine pages. The companies that were working on text composition for commercial typesetting were not working on copyediting.

Although Doug and Charlie did not have anything to show, it was clear to me that what they were planning was close to what *U.S. News* was looking for. Because Atex was a start-up, it had the opportunity to accommodate higher-quality text composition from the get-go.

So, I told them that my father was working with someone who might need exactly what they were proposing, and I would pass the contact on to him. My father talked this over with John Touhey, and they decided that they were desperate enough to take a good look at Atex.

Touhey ended up making a “you just bet your job” deal with Atex:

- *U.S. News* signed a contract that included up-front funding for the project in exchange for a minority interest in Atex.
- There were very specific milestones with specific dates and payments that were released when the milestone was met.
- *U.S. News* would provide specifications and guidance on how to produce the quality of text composition required.

As part of his consulting contract with *U.S. News*, my father helped tutor Atex people on typography. While at Rocappi (see the History of Rocappi article in this issue), he had created (on his own time) a unique hyphenation dictionary that contained first, second, and third preference points for hyphenating every word. He had granted to Rocappi the right to use this. As part of his contract with *U.S. News*, he had also licensed it to them. He then worked with the *U.S. News* in-house hyphenation expert to expand and refine the dictionary. *U.S. News* then licensed this version to Atex as part of its investment in Atex.

Atex did get the initial system running just in time to meet the switch-over deadline. That initial production system was refined and upgraded over time, and then grown into a full editorial and production system. *U.S. News* was fully operational and transmitting fully made-up text pages in 1974. It was transmitting complete magazine pages, including all pictures and graphics, in 1977.

*U.S. News* made a huge return on its investment in Atex when Atex was sold to Kodak. Touhey and my father remained friends for the rest of my father’s life.

## EDITOR’S NOTE ON ATEX HISTORY

### The Partners

The three partners in Atex started on a shoestring with little background in the publishing industry. Their original location was a converted grist mill (from the early days of Lexington, Massachusetts) with an insurance company on the first floor and Atex on the second floor and in the loft.

Doug Drane’s article explains his background. The Ying brothers, Richard and Charles, traveled from China via Hong Kong to go to college at the Swiss Institute of Technology. When there was trouble with admission because younger brother Charles was only 15, they got themselves accepted to MIT (by then Charles was 16).<sup>1,2</sup> While at MIT, they held various part-time and summer jobs, including at Hendrix, which was mentioned by both Drane and Seybold and where they picked up what little they knew about the publishing industry before Atex. According to Richard Ying, Charles was at Hendrix for two or three years, “designing editing terminals (vector graphics) where everything was done in hardware.”<sup>3</sup> Richard was with Hendrix half as long, “integrating the terminals into an editorial system based on the ... PDP-8 computer.”

At Atex, Richard Ying handled the software and eventually became the vice president of software. Charles Ying handled the hardware; although in some of the part-time jobs while at MIT he had done software development, he eventually became the vice president of engineering. Doug Drane was president and oversaw administration, finance, sales, and marketing; the Ying brothers also “had their say in those areas.”<sup>4</sup> Richard had studied architecture at MIT and with this background also “oversaw the design of the logos [see Figure 1], the terminal, and the work spaces.”

## Hardware and Software

The typical early Atex system comprised dumb terminals, which consisted of CRT displays and Atex custom-designed keyboards optimized for production page composition (see Figure 1). The terminals were driven by a centralized computer system consisting of software and a general-purpose computer board (typically the lowest-end PDP-11) and custom-designed hardware in an Atex-supplied chassis.<sup>3,4</sup> The custom-designed hardware included memory-management/memory-mapping hardware and video-buffering hardware such that each central system could handle up to 32 terminals. Communication between the CPU and the custom display boards used shared memory, and the communication between the display boards and the terminals was raster video via coaxial cable outbound and character by character inbound, all via a two-component cable—coax and twisted pair. In a later incarnation, the dumb terminals were replaced by PCs, and the communication between the display controllers and the terminals was via Ethernet.<sup>4</sup> Atex also developed their own bus-based local area network that “allowed for the tightly coupled interconnection of up to 15 PDP-11s and support over 200 terminals that could share a common database with pair-wise redundancy and no single point of failure.”<sup>4</sup>

Atex developed their own custom-designed keyboards and bus-based local area network.

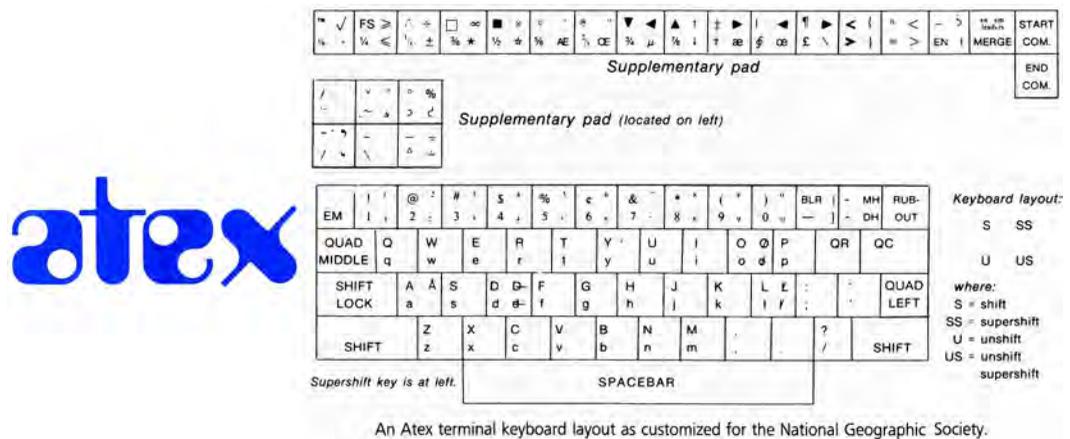


Figure 1. Atex logo and Atex keyboard.<sup>5</sup> The Atex custom-designed keyboards were optimized for production page composition.

The software consisted of an Atex-developed multiuser/multitasking operating system (fitting in a few kilowords of memory and able to switch contexts with only a few instructions) and publishing-oriented application software. Their PDP-11-based software development environment consisted of a macro assembler, a line editor, and the PDP-11 DDT debugging tool. Originally their development terminal was an ASR-33 teletype. After Jeff Caruso had an editor of Atex’s own design running (oriented to production page composition and publishing), they switched to using that editor also for software development. (Later, a couple of Atex employees left the company, reconceived the Atex editor, and sold it widely as the XyWrite editor.<sup>6</sup>)

Other application software consisted of adopting an existing, well-known page markup language; the hyphenation dictionary from John Seybold and *U.S. News* (see accompanying Seybold anecdote); hyphenation logic likely copied from the IBM 1130 H&J program, as that logic was already widely accepted in the newspaper industry; and storage and retrieval logic adapted from an algorithm used in the programmer's prior job. (Generally the employees brought methods from their prior lives in technology.)

Each Atex system was customized for a particular installation, and Atex put the software for each installation on a removable disk drive that was stored in a closet to be used for maintenance or as a starting point for later upgrade of an installation.<sup>7</sup>

The company obtained several US patents for its systems, including patents 3,980,994, "Text editing and display system having text insert capability"; 4,057,849, "Text editing and display system"; and 4,150,429, "Text editing and display system having a multiplexer circuit interconnecting plural visual displays." Founder Drane reports that having some patents helped competitively because it showed customers that Atex had sufficient intellectual property rights to remain in business.<sup>8</sup>

## Markets and Products

Because of Atex's initial contract with *U.S. News & World Report* (see accompanying Seybold anecdote), periodicals was a natural market for Atex. Some of Atex's other periodical customers were the National Geographic Society, *The Economist*, *Forbes*, *Newsweek*, and *Reader's Digest* (both in the US and Canada). However, Atex found there were a lot more newspaper customers than periodical customers, and this became a bigger market for Atex. Drane has suggested that *Newsday* was the first newspaper customer, but others remember the *Beverly Times* (Beverly, Massachusetts) happening before *Newsday*.<sup>4,7</sup> In a January 1980 list (provided by Caruso) of about 130 customer installations (with some companies having multiple installations), about 45 percent were at newspapers, 15 percent were at periodicals, and 40 percent were other types of companies and institutions. For example, Atex customers included a yearbook company, a tractor manufacturer, an atlas company, and a variety of US government agencies, such as the Government Printing Office, along with the US Senate and Supreme Court. In other words, Atex worked with any organization doing a lot of publishing of printed materials. Atex also expanded its efforts to Europe. The first system at *The Economist* had been installed in 1976. By the late 1970s, there were agencies in London and Sweden addressing the western European market. Atex also had sales efforts in Australia and South Africa and a newspaper client in Kuala Lumpur.

Starting with *U.S. News*, Atex followed the three phases recommended by John Seybold (see accompanying Seybold anecdote): initially the production of text pages with images included outside the Atex system, next a full editorial system, and finally the addition of digital images. Over time, Atex expanded its system offerings. A 1988 encyclopedia describes Atex systems at some length as an illustration of the state of the art of "computer-aided composition,"<sup>9</sup> specifically as an illustration of a company "offering large-scale composition systems to the magazine and newspaper publishing industry." It also gives Atex as an example of the evolution from an end-user text-processing system to an electronic publishing system. The article describes (a) an editorial and news layout system for composing full pages of a publication, (b) a classified ad pagination system that automatically repaginated according the publications style specifications when a new ad arrives, and (c) a system for publication design and ad placement that had a shared database of news and ads and automatically dummied them up for an entire newspaper section, at which point a staff person could resolve complex issues and send the final version on for printing. Along the way, Atex began to use Eikonix terminals to enable a mix of color and black-and-white images.

Because each installation was a custom system, various expansions of the Atex offerings were originally developed in collaboration with specific customers, such as a WYSIWYG page-composition system for the *Minneapolis Star Tribune* (see the transcripts of the May 2017 Desktop Publishing Pioneers Meeting<sup>10</sup>). A small, but highly useful feature of later Atex systems was Atex Messaging, which was a texting- or email-like feature that allowed communication among the users of a particular Atex installation.

Atex was not in the phototypesetting business itself. Its systems “drove whatever device the customer had. Most large newspapers used the Autologic APS-5 for its speed. The magazines mostly used III [Information International Inc. system] for its full magazine size page capability. The commercial type houses often used the Mergenthaler VIP because of its extensive high quality analog typeface collection.”<sup>4</sup>

Figure 2 lists Atex systems as of a 1985 supplement<sup>11</sup> to a 1984 book by John Seybold summarizing the state of the digital typesetting industry.<sup>6</sup>

Atex	
Atex 8000 (PDP-11/05 or 11/35, or 04 and 34). Computer also serves as controller for Atex-built terminals.	Release 4 software (1981). Spellcheck (1982).
9000 newspaper system.	5000 newspaper system (1982).
7000 newspaper system (April 1981). Models 7032, 7048 and 7064.	Atex 1000 remote terminal (1981). Atex 1500 “full-function” remote (1981).
4000 (see also AKI).	Atex 9080 remote cluster (1981).
4000S (with Release 4 software) 1984.	Atex 500 remote terminal (1982).
GT68 Graphics and pagination terminal. (Motorola 68000) (1982).	Atex library or morgue system.
Classified ad pagination.	Electronic library system jointly with Infotex (1981).
Release 3 introduced 1979.	Acquired by Eastman Kodak 1981.
Atex PC interface software supports virtually any PC running virtually any word processing and communication software.	TPE (Total Publishing Environment) products.

Figure 2. Atex systems. This list from a 1985 book supplement by John Seybold shows Atex systems to date.

## Growth, Sale to Kodak, and Later

In its boom years, Atex grew from the small staff on the second floor and in the loft of the converted grist mill to more than 1,500 employees in offices in Burlington and Bedford, Massachusetts, including a large manufacturing capability.

In 1981 Atex was purchased by Eastman Kodak. The company was still privately held, and the three founders reaped most of the rewards, although *U.S. News* made money on its investment and about 100 employees had some equity in the company. Atex originally approached Kodak about using its “photographic imaging chemistry and lasers” so Atex could “develop a complete pre-press publishing system.”<sup>12</sup> Richard Ying says that he also hoped that Kodak would bring in more management skill. A Seybold report<sup>13</sup> concurs with the assessment that Atex needed more professional management. The company was also faced with the challenges of changing technologies and market expectations. Wally Weiner remembered, “With the advent of fast cheap commodity PCs and workstations and the adoption of ethernet and loosely coupled systems as the preferred interconnection methodology, Atex’s strategy of tightly coupled and centrally controlled systems just couldn’t compete. Also, their target market in the print industry was about to go into a steep decline.”<sup>14</sup>

By August 1982, Drane had left the company to pursue other interests (as noted in his accompanying anecdote). Charles stayed with AKI, a small manufacturing company Atex had acquired, until Kodak closed that unit of the company, and he continued to be involved printing- and publishing-related businesses, for example, as president of Information International Inc. (1992–1996), chairman of PageFlex (1999–2004), chairman of Bitstream (1997 until his death in 2010, including serving a president until 2003), and founder of MyFonts.com (1999–2010). (I have been unable to ascertain what Richard did next.)

In 1988 Atex was still selling its systems to high-profile customers (for example, the *New York Times*<sup>15</sup>), but by 1991 the company was in rapid decline,<sup>15</sup> and in time, Kodak sold the company to European investors.<sup>16</sup> The company still exists today in a substantially evolved state. Various systems installed in Atex’s heyday continued to run for many years; for instance, the *Boston Herald* shut down its 1983 Atex systems in February 2010.

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## ABOUT THE AUTHOR

**Jonathan W. Seybold** worked with his father, John Seybold, at Rocappi, where he was responsible for overseeing software development, hardware selection, production operations, and complex projects. Together they founded Seybold Publications in 1971. It produced The Seybold Reports on publishing systems, professional computing, desktop publishing, and digital media. Jonathan founded Seybold Seminars in 1980. It conducted conferences and trade shows on the same topics. He ran both Seminars and Publications until 1995 and has worked on publishing automation since 1965. Seybold has a BA in economics from Oberlin College. Contact him at [mail4js@mac.com](mailto:mail4js@mac.com).