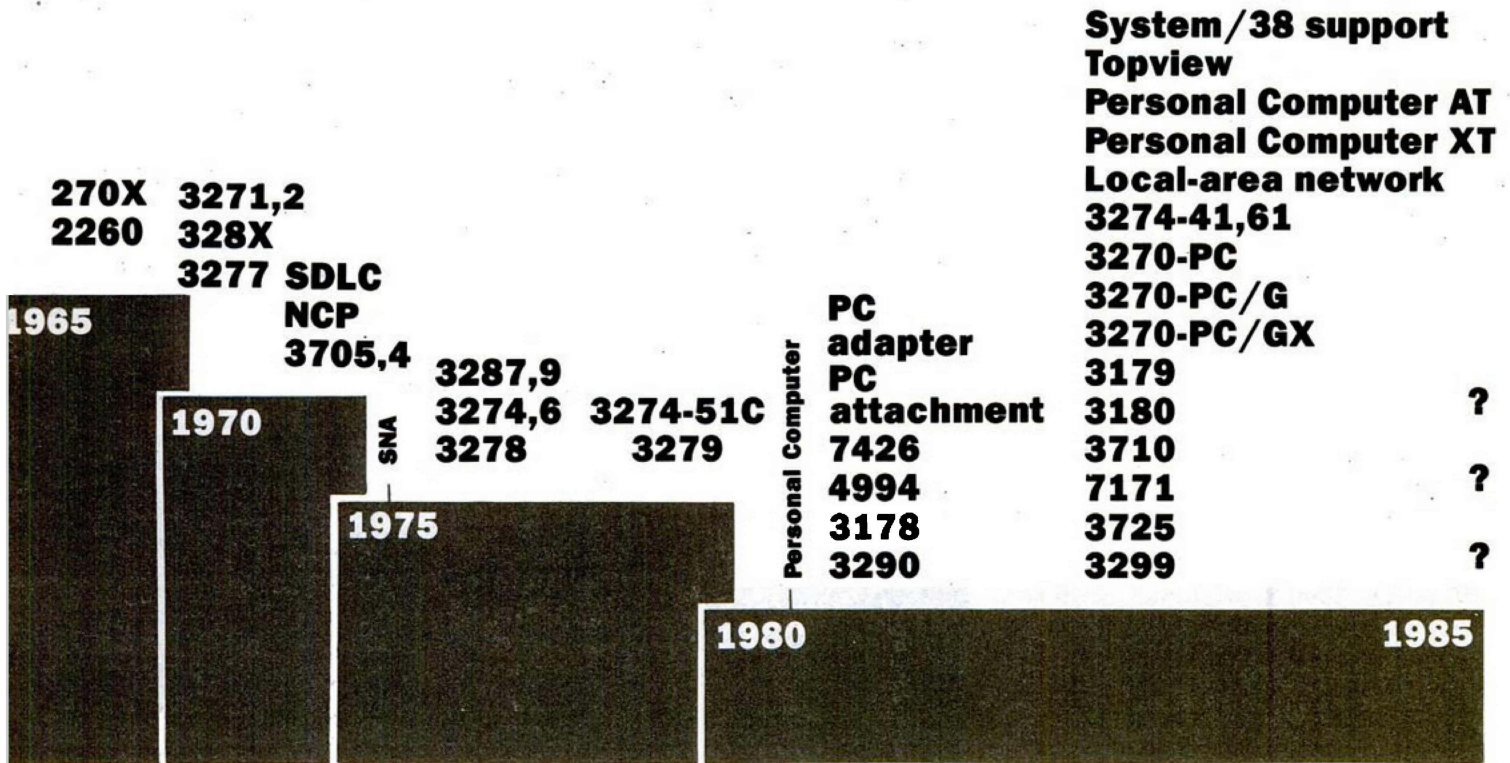


# Evolution of the IBM 3270



## *Cycle of change speeds up*

By Scott Brear

The IBM 3270 family has been available in various forms for nearly 15 years — some would even say since the introduction of the IBM 2260 display system in the mid-'60s. The 3270 products generally consist of a cluster of several editing CRTs, such as 3278 display stations, coupled to a polled cluster controller unit — the 3274, for example. Frequently, a printer such as the 3287 is also part of the cluster.

Indeed, IBM cast its lot with the earlier 2260 when it developed this concept of polled clusters over dumb and relatively inexpensive asynchronous Ascii CRTs as the principal means of user interface with IBM hosts. This direction was subsequently reflected in IBM's inattention to both asynchronous terminals and telecommunications support over the next decade — a point not missed by a generation of product planners.

This concept of small clusters of editing CRTs connected by coaxial cable to a synchronous remote or local control unit — around which millions of programmer hours of specific soft-

ware applications have been written — became popular enough to sell millions of devices worldwide. The 3270 product has become an institution with a longevity matched only by that of the omnipresent IBM 3420 which, until very recently, was the premier tape drive of IBM mainframe users. And, as with the 3420, the 3270 system has been widely emulated by major competitors offering lower prices, earlier delivery and more features than IBM.

As one might expect, the competitive scenario for 3270 products has undergone tremendous changes. No longer can competitors count on IBM's having the highest price, slowest delivery and fewest features. Some major participants have left the business or consolidated with others; some have just entered the battle armed with the skills to interface and compete with IBM, using somewhat non-traditional methods.

As the chart above shows, from 1971, when the first 3270 systems were announced, until about 1981, there was, on the average, only one

major product announcement each year. In fact, a full five years separated the announcement of the first-generation 3271- and 3272-based clusters and the release of the second generation, generally represented by the 3274 cluster.

Five years later, just when users were expecting a new product line, they were greeted with several major 3270 enhancements in what became one-year, then six-month and now three-month cycles.

The magnitude of the 3270 system explosion can best be understood when divided into functional segments, such as:

- Basic 3270 components.
- Personal computing.
- Protocol conversion.
- Coaxial cable-based technology.

The basic 3270 cluster components have changed considerably since their introduction in terms of flexibility and features. The explosion first brought a low-cost 3178 12-in. display station. After many years of offering large, inflexible displays, the 3178 was welcomed for its smaller size and ergonomic features, such as a swivel mount for user convenience. In fact, the 3178 closely resembled the IBM 3101 display terminal, an asynchronous CRT device.

The 3178 was also significant for its highly competitive pricing, including volume discounts, and user self-installation and maintenance plans. There is no question that the 3178 stunned the competition, which then rushed their own low-cost displays into the marketplace.

Along with the 3178 came the 3290 information panel, which was able to display as many as four regularly sized CRT images simultaneously, using flat-panel plasma technology. The 3290, which cost more than twice as much as regular 3278 displays, was not about to be a widespread replacement. Rather, it served as a useful computer room or unique applications tool, while at the same time demonstrating IBM's technological prowess to trade show audiences.

The 3270 control unit products were also enhanced to use new products and features, such as the 3290. The 3274 control unit was offered in new Model 41C and 61C versions with more memory, more standard features and a lower cost. For example, the 3274 control unit entry assist function was added as a user convenience, giving some word processing capabilities to on-line data entry operations.

Significantly, the small System/38 now supports the 3274 Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) cluster, providing access to applications that once required a specialized 5251 display station to access. Software in the System/38 converts 3270 data streams for the 5251 applications.

Does this portend a move to a single family of display stations? Perhaps this move is not too far away if one considers some features of the new 3180 display station family. For example, the 3180-1 has been announced as a replacement for the 3278, while the 3180-2 is intended to replace the 5251 for System/34 and System/38 hosts.

The displays are essentially the same in physical terms, but are differentiated by software downloads that can determine keyboard assignment and other operational parameters relevant to their hosts.

The 3180-1 display station and its companion 3179 color display station announcement were significant for other reasons as well. Serious inroads were being made in the 3270 market by several competitors who could offer all of IBM's display sizes — 80 char. by 24 char. through 132 char. by 27 char. — in one device, saving inventory and money and greatly improving user flexibility.

The 3180-1 met this challenge by providing the ability to display any standard screen size on one 15-in. ergonomic terminal. And, if this were not enough, prices came down again. The 3179 was also welcomed by IBM users as it offered a fresh-looking, lower priced alternative to the older, bulky 3279 color product.

Perhaps personal computer users have had the greatest impact on the 3270 system by challenging the pre-eminence of the existing large host and cluster controller computing environment while urgently seeking access into this same environment. Very soon after the Personal Computer was announced, the industry was speculating as to how and when it would be interfaced with the 3270 product line. It seemed, by many, to be a natural fit.

This speculation ended when the Personal Computer attachment product was announced but was soon followed by disappointment as users realized that this product was a complex "bolt-on" to existing 3278 display stations.

The Personal Computer has been a success, with an installed base approaching two million and expected to reach a possible 15 million units in a few years. Data processing managers were not expecting this potential threat to their domain to become a powerful extension via their 3270 systems and software. But the capability was there. Coaxial cable adapter cards and software, the IBM Personal Computer 3278/79 emulation adapter, became available, which enabled the Personal Computer to emulate directly a 3270 display station.

File transfer became an issue as users realized the usefulness of freely moving files between their hosts and the new little helper; however, users were unhappy to learn about limited file types, relatively slow transfer speed and threats to host data base integrity.

Finally, a completely integrated product, the 3270 Personal Computer, was announced that combined the host-interactive functions of the 3270 information display system and the computing power and versatility

of the IBM Personal Computer. The 3270 Personal Computer offered single-session operation (the control unit terminal mode) or a unique multi-session mode (the distributed function terminal) where one 3270-PC could interface with as many as four 3270 sessions. This feature, also used with the 3290 information panel, was expanded to allow two notepad sessions and one DOS Personal Computer session.

The 3270-PC also had screen windowing, keyboard macro definition, file transfer and many other useful features. Since the original announcement, several powerful graphics versions of the 3270-PC have been introduced and widely promoted for special-purpose applications.

#### Terminal interfacer unit

IBM offers protocol conversion? Yes, and it has for several years, if protocol conversion means enabling asynchronous terminals to talk to 3270 applications. It seems that the IBM 7426 terminal interfacer unit, released in October 1982, was IBM's first real venture into protocol conversion, providing a remote or loop-connected facility for the connection of a limited number of asynchronous devices, such as its own 3101 asynchronous terminal.

On the other hand, the Yale Package — an IBM Series/1 minicomputer with Yale University-created software, available on a special quote basis — became the IBM 4994, an Ascii device control unit. Apparently, this happened when IBM granted it formal product status. Only IBM knows how successful it was with the 4994, since market figures are buried in Series/1 statistics, but there were some limitations, such as the type of terminals to which the 4994 could interface.

In addition, IBM offers a synchronous communications adapter board and software that converts the Personal Computer into a 3270 display station/control unit running either Binary Synchronous Communications or SNA/SDLC. Of course, running full steam against all of these offerings are the protocol converters of dozens of companies claiming to offer lower price, faster delivery, more features and wider terminal support.

Just when everything looked safe for participants in this small segment of the 3270 market, the IBM 7171 Ascii device attachment control unit was announced. The 7171, which adds significant credibility to the concept of the 3270 protocol conversion, replaces and greatly improves on the 4994, in terms of price and features. For example, the 7171 can directly connect to host channels as a pair of 3274 control units offering 3270 emulation to 64 Ascii terminals via direct connection, asynchronous dial modems, line drivers or data private automatic branch exchanges.

Host and software limitations were removed, but the 7171 is still a locally attached product inapplicable to more than three-quarters of all of the 3270 applications that exist in a remote synchronous network envi-

ronment. However, IBM has placed the burden of dial-in security totally on the host; the 7171 has no password or other types of security common in today's protocol converters.

Furthermore, the 7171 entry size of 16 channels will make it a solution for only very large users. Nevertheless, IBM has turned over one more stone in its efforts to control the 3270 market.

#### Multiplexer unit

Coaxial cable technology has not stood still either. While not a leader in innovative coaxial cable products, IBM finally offered a 3299 terminal multiplexer unit that allows up to eight devices to share a single 5,000-ft. coaxial cable line. Offered by a few competitors for several years prior to the IBM announcement, the 3299 offered significant savings where coaxial cable runs can cost up to \$1 per foot to install or where no room for expansion exists.

There are alternatives from other vendors, such as multipoint coaxial cable attachment, but IBM's local-area network product, when available, should allow the faithful to move in this direction as well.

Users now have an assortment of coaxial cable devices to choose from when configuring their 3270 systems. Not only can the Personal Computer have an expansion board giving it 3278/3279 emulation, but products are available from certain creative competitors that allow virtually any asynchronous Ascii device to emulate 3270 displays or printers.

What's next? Is a new 3274 control unit on the horizon? Only IBM knows — and it is not talking. The product family will not die soon; there are too many software applications written. Remember, it has taken IBM nearly 10 years to withdraw Tcam telecommunications access method support. But it will probably evolve into a much more flexible product with features now available with the more expensive 3270-PC.

A single clustered terminal family will probably apply across all IBM products, making the 5251 product virtually obsolete. The concept of file transfer, which today has been shoehorned into the capabilities of existing hardware and software, will be expanded into a highly functional user tool controlled by mainframe data processing managers.

Finally, networking concepts will change as users become comfortable with the new local-area network technologies and new networking products such as the IBM 3710 network controller.

The 3710 should not go unnoticed by 3270 managers, since this remotely connected device can look like a 3275 communications control unit to 31 Model 3274 control units or protocol converters. And, as IBM indicates in its 3710 product announcement, it "intends to provide . . . full screen protocol conversion capabilities integrated within the 3710."

#### About the author

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