



**MEMOREX TELEX**

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**A corporate  
profile**

THE COMPUTER HISTORY MUSEUM



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## CONTENTS

<b>Page</b>	<b>Title</b>
<b>Section 1</b>	<b>Overview and company history</b>
4	Serving the world's computer users
5	Memorex Telex in brief
6	Financial profile
8	Business philosophy
13	The story behind the name
15	Company history
17	Background to the merger
<b>Section 2</b>	<b>Markets and product areas</b>
22	Intelligent systems
25	3270 networks
28	Large storage systems
36	S/3X environment
38	Computer supplies
40	Memorex Telex services
41	Leasing and brokerage
42	Memorex Telex systems
44	Telex Communications Inc
<b>Section 3</b>	<b>People and contacts</b>
46	Executive profiles
50	How to contact Memorex Telex

## MEMOREX TELEX NV A CORPORATE PROFILE

This book presents a corporate profile of Memorex Telex NV. It is intended for use as a journalistic resource and will be updated regularly.

The facts about Memorex Telex are contained in easily referenced form together with brief profiles of major Memorex Telex businesses and people.

Memorex Telex encourages the free exchange of information and - subject to commercial security - will be delighted to provide additional material or answer press queries on any aspect of its policies and operations.

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# SECTION 1

**MEMOREX TELEX :**

**OVERVIEW**

**AND**

**COMPANY HISTORY**

## **MEMOREX TELEX: SERVING THE WORLD'S COMPUTER USERS**

Memorex Telex is the world's largest supplier of plug compatible computer equipment and computer supplies, with revenues of over \$2 billion, and is building on that position by making available products which incorporate every appropriate technological development. The company has operations in 27 countries and distributors in a further 50.

The company's 13,000-plus employees, and the decentralised, entrepreneurial management which leads them, pride themselves on their integrity and total commitment to responding to every customer's needs.

The company's service organisation ensures that every Memorex Telex device - regardless of its location - is, and always will be, fully supported by a team of highly trained engineers.

The company capitalises on the inherent strengths of its people, products, quality and structure, and spreads the "service to customer" culture through every facet of the organisation.

Customers everywhere are assured of having the very best product, when they need it, through the company's policy of flexible product sourcing, using either internal or external development and manufacturing facilities.

The enthusiasm of Memorex Telex employees, suppliers and distributors is focused on providing users throughout the world with reliable, cost-effective solutions to the ever-growing need for efficient data management.

**MEMOREX TELEX****IN BRIEF**

Parent company	Memorex Telex NV
Main business	World's largest IBM plug compatible peripherals supplier
Corporate philosophy	Decentralized market driven company
Revenue in 1987	\$2 billion plus
Place of registration	Amsterdam
Ownership	Private
Chairman and chief executive	Giorgio Ronchi
Corporate headquarters	Amsterdam, The Netherlands
Corporate communications	London
Number of employees	13,000
Service organisation	3,800 engineers worldwide
Sales support	4,000 worldwide
Locations	Direct in 27 countries distributors in further 50
Flexible product sourcing	Products sourced both from within the company and from other industry leaders
Manufacturing capability	12 wholly owned plants
Equipment customer base	60,000 plus
Installed equipment base	1,500,000 units plus worldwide
Main areas of business:	Cluster controllers Communications accessories Computer supplies Disk drives and tape drives Intelligent workstations Memory add-ins/add-ons Printers Solid state devices System printers Terminals

## MEMOREX TELEX A FINANCIAL PROFILE

In January 1988 stockholders of The Telex Corporation overwhelmingly accepted the tender offer made by Memorex International NV, leading to the merger which resulted in the creation of Memorex Telex NV.

Prior to this Memorex had just successfully completed its first year as an independent company. This followed its management buyout in December 1986, the company having raised the necessary \$623 million funds.

Memorex had achieved revenue and profit figures for that first twelve months which were in excess of the targets set by the funding institutions and which were also considerably better than the performance of the previous year.

During the same twelve month period Telex had recorded an increase of 19% in revenues and 20% in profit.

The successful status of both companies, the obvious synergy between them and their potential for growth as a combined force were seen by the investment/funding community as an attractive and exciting opportunity.

It was this combination of proven success, compatibility, and growth potential that enabled the management to put together the \$1150 million merger package.

**MEMOREX TELEX 1987 REVENUE ANALYSIS**

(\$m)

(By market)

		%
3270	653	32
Large storage	299	15
Computer supplies	208	10
Airline systems	150	8
S/3X	84	4
Telex Communications Inc	89	4
Other	96	5
Service	434	22
<hr/>		
Total	<u>2013</u>	100
<hr/>		

**MEMOREX TELEX 1987 REVENUE ANALYSIS**

(\$m)

(By area)

United States	993	49%
International	1020	51%
<hr/>		
Total	<u>2013</u>	100%
<hr/>		



## BUSINESS PHILOSOPHY

The Memorex Telex business philosophy is to be a de-centralized, market driven company, with the aim of being THE global supplier in the plug compatible market place.

A plug compatible device is one that can be directly installed into an existing computer system with no need for any further work. A plug compatible device simply "slots in" and works, it is compatible with the computer environment within which it is situated.

Memorex Telex provides a broad and extensive range of equipment solutions for the efficient management of data.

Customers cover the whole spectrum of commerce, industry, public and service sectors worldwide. These customers have chosen Memorex Telex plug compatible equipment and products because of the added benefits they offer, whether it be in terms of unique features, enhanced performance, price, reliability, and support, or a combination of all of these.

Equipment and products covered by Memorex Telex's extensive range include terminals, printers, storage devices, and intelligent workstations.

Complementing the equipment is a comprehensive range of computer supplies, which includes such products as computer tape, flexible disks, high speed tape cartridges and printer ribbons.

No other plug compatible supplier has such a breadth to its range.

In addition, the company has a subsidiary - Telex Communications Inc - which serves specialised niche markets in four key areas - education and training, hearing instruments, communication accessories and industrial antennas.

It is the methods used for the procurement, manufacture, sale, supply and distribution of these products, both equipment and supplies, which demonstrate the de-centralized nature of the company organisation.

Memorex Telex operates a flexible sourcing policy, using both its own manufacturing resources, and also those of the other major producers in the world.

This dual sourcing policy also acts as an insurance policy for the company, as it generally provides Memorex Telex with more than one source, or manufacturer, for any product.

Among the products manufactured by Memorex Telex at the company's 12 manufacturing facilities in the US, Australia, UK, Ireland and France, are terminals, intelligent workstations, impact printers, cluster controllers, flexible disks and computer tape.

In this manner Memorex Telex enjoys 'the best of both worlds' in that it has the resources within the company to develop and manufacture its own market leading products, and the flexibility to access other specialist technological developments from outside its own operations.

This method of operation has been shown to have enormous benefits both to Memorex Telex and its customers who enjoy a choice of supply, other than the original system vendor, and a range of products from the world's technology and industry leaders.

Memorex Telex sells its product lines through wholly owned subsidiary companies in 27 countries and via distributors in a further 50 nations.

This means that each nationally based operation is responsible for all of the company products and services available within that country.

Exceptions to this are in the computer supplies and airline business areas where trading responsibilities are handled by dedicated teams operating independently of the local management, reporting instead to a central organisation.

In total, the company currently looks after the needs of over 60,000 equipment customers, and has more than 1.5 million devices installed around the world.

This style of organisation, with a large amount of autonomy and responsibility at country level, has enabled the company as a whole to benefit from the entrepreneurial skills of the individual country managers.

### KOB OPERATION

Equipment and products which the national companies supply are divided into main areas of business, and each of these areas has its own global, centrally managed supply division which provides the individual operating companies with their product lines.

Within Memorex Telex the product procurement/manufacturing divisions are known as KOBs or Kinds of Business.

Each of the four KOB centres is responsible, on a global basis, for the product planning, engineering, sourcing, marketing support and distribution of a range of products dedicated to its particular business.

The four KOBs are :-

3270 networks.

Intelligent systems.

Large storage systems.

System/3X.

KOBs are also responsible for consolidating forecasts from sales and service subsidiaries, and procuring the planned level of demand from suppliers, both within and outside the company. KOBs constantly monitor competitors' product costs to ensure that procurement strategies are competitively strong.

By keeping in constant touch with company operations throughout the world, the KOBs are able to determine market needs, along with any changing customer requirements.

A major part of the company's operation, although not a KOB, is the computer supplies division. This company manufactures, procures and distributes a comprehensive range of computer supplies and accessories, from magnetic media, such as computer tape of many varieties, to paper, cables, plugs and furniture.

#### MARKET GROWTH

The company's primary business markets show strong potential over the coming decades.

From 1986 to 1996 the market for terminals in the US alone is expected to rise from \$8.6 billion to around \$14 billion.

Over the same period of time the terminal market in Western Europe is expected to rise from \$4.3 billion to around \$9 billion.

The total worldwide market for both terminals and other peripherals is expected to rise from \$52.4 billion in 1986 to approximately \$112 billion by 1996.

Strong growth is also predicted for the intelligent workstation market. Worldwide this market is expected to show a 52% growth rate between 1988 and 1992.

The worldwide mass storage market alone is expected to be worth in the region of \$30 billion by 1990.

Memorex Telex with its combination of experience, installed customer base and range of product and service is ideally placed to take advantage of these forecasts.

## THE STORY BEHIND THE NAME

Both Memorex and Telex come from humble beginnings.

### **Memorex**

On February 9, 1961, the Memorex company founders incorporated the name "Memorex".

The name, a combination of "memory" and "excellence", reflected their intention of producing a better computer tape product.

Under Larry Spitters, Donald Eldridge, W I Noon, Arnold Challman and 14 employees, the company seized the opportunity to create an alternative source of precision magnetic tape.

This they very successfully achieved and what began above a garage in Mountain View, California, has since grown into Memorex Telex.

### **Telex**

From his home in Minneapolis, Minnesota, Allen Hempel began manufacturing the first wearable vacuum tube hearing aid in 1936. This product revolutionized the hearing aid industry.

Hempel wanted to form a company with a name ending in "ex" because he felt it was easy to remember and would be pronounced the same in almost every language. In addition, he had been experimenting with tiny coils as magnetic pick-ups in his hearing aid.

These coils were similar to those used in telephones of that time. He combined the two ideas to form the new name "Telex".

In the early 1960s, the Telex name was challenged.

On April 22, 1964, both The Telex Corporation and Western Union Telegraph Company entered into an agreement essentially acknowledging that Telex had ownership of US Trade Mark Registration No. 517,386, but that the word "telex" (note lower case "t") had acquired a generic significance as applied to "teleprinter exchange services". This phrase had passed into the language as "telex".

The essence of the agreement stated that Western Union could continue to use the word "telex" to describe its communications equipment, as long as the word was immediately preceded or printed above the trademark "Western Union" in equal or larger type.

Hence the completely separate and unconnected growth of both the company of Telex and the telex machine.

## COMPANY HISTORY

The history of Memorex Telex starts back in 1936 with the foundation of Telex and totals nearly 80 years of experience in the computer and telecommunications industry.

Over the years the companies have maintained a steady working relationship which, on several occasions in the past, almost resulted in merger. Indeed, many of the people now working for Memorex Telex have had experience of working for both of the previously separate organisations. In some instances, people have moved between the companies more than once.

This close historical association serves to demonstrate the harmony of the two entities which now form Memorex Telex NV.

Both companies have shown a capability to grow and prosper within their own environment over the course of their development. This is illustrated by the following list of key dates and historic milestones which make up the background to the formation of Memorex Telex.

- 1936 Telex founded. Founder Allen Hempel, from his home in Minneapolis, developed the first portable hearing aid.
- 1940 Telex Products Company incorporated. The company began to manufacture miniature transceivers and receivers for the war effort.
- 1945 Name changed to Telex Inc. Product line now included audio devices, headsets and electronic devices.
- 1959 Telex Corporation became publicly owned and revenues were \$4.5 million.
- 1961 Memorex founded by Larry Spitters. Company's first product, manufactured above a garage in Mountain View, California, was an improved magnetic computer tape.
- 1962 Telex acquired Midwestern Instruments Inc. Telex entered the data processing market and subsequently developed the revolutionary computer memory storage device - the fixed disk memory.



- 1969 Memorex entered the plug compatible market with first disk drive.
- 1975 Memorex introduced its first terminals.
- 1976 Telex acquired Terminal Communications from United Technologies Corp. Telex entered IBM compatible terminal and printer market.
- 1978 Memorex acquired Telex's European operations. Telex concentrated on domestic US market while Memorex expanded internationally in IBM compatible markets.
- 1981 Memorex acquired by Burroughs Corp, primarily for its expertise in disk drive technology and associated products.
- 1984 Telex grew to \$325 million in revenues. Acquired Raytheon Data Systems. By adding Raytheon's line of airline reservation terminals Telex nearly doubled revenues.
- 1985 Telex launched intelligent terminal range.
- 1986 Memorex grew to almost \$1 billion in revenues.
- 1986 Burroughs and Sperry merged to form UNISYS. As a result Memorex was effectively "for sale" in order to raise cash to fund the merger.
- 1986 Memorex bought out by management in \$623 million transaction, the computer industry's largest such transaction.
- 1986 Telex acquired United Technologies Communications Company, the PBX (telephony) division of United Technologies Corp.
- 1987 Telex, subject of hostile takeover bid from Asher B Edelman, agreed amicable \$1150 million package merger with Memorex.
- 1988 Memorex Telex NV formed.

## BACKGROUND TO MERGER

The story behind the merger of Memorex and Telex is the story of a shared history, in many instances, and of long term association.

Before going into the actual merger it will be useful to explain the method by which Memorex itself became independent from Burroughs/Sperry - Unisys.

During 1986 Burroughs and Sperry merged to form Unisys. At that time Memorex was a part of the Burroughs organisation, having been bought by that company back in 1981.

In the aftermath of the merger Unisys found itself in need of cash.

To this end certain areas of business within the organisation that were considered viable entities in themselves, or which were not "core" business factors in the future of the new Unisys, were effectively "put up for sale".

Some members of Memorex International put forward a bid to buy out the company from its parent, in the face of some very strong interest by other companies within the computer industry.

The finance package for the proposed buyout was put together with the help of some of the world's leading investment and financial institutions. The buyout team was able to demonstrate that an independent Memorex under their guidance could become a very profitable company and an excellent investment opportunity.

The result was that the management team was successful and, in a transaction worth some \$625 million, Memorex became a privately owned, independent company.

This management buyout was by far the largest of its type anywhere in the computer industry, and is all the more remarkable because of the very short period of time in which the whole thing took place. From the issuing of the letters of intent by the buyout team to the actual "purchase" of the company, the transaction took only three months, from October to December 1986, during which time the complete financing package had to be put together.

During the following 12 months Memorex restructured itself and the way in which it organised and ran its businesses.

The restructured company met with such success that it was able to arrange a refinancing package on better terms, and replaced \$315 million of the original investment programme within nine months. The company attracted a private placement of some \$22.5 million by two of its investment partners, Morgan Capital Corporation and Noro-Venture 1 BV.

So Memorex approached the end of its first year of independent operation buoyant with success and industry recognition of its achievements. Many new product lines had been introduced and the new management structure was beginning to show its merits, the investors were very happy with the company's performance and all looked very good for the future.

Meanwhile, in America, The Telex Corporation was the subject of a hostile bid by New York based financier Asher Edelman.

On October 8th 1987 the SEC (Securities and Exchange Commission) in New York was informed that Edelman had acquired 7.1% of Telex Corp stock. (This was a legal requirement at that scale of share ownership in a publicly quoted company).

In mid-October Telex contacted Memorex through their mutual financial institution, Drexel, Burnham, Lambert. A deal was proposed to Giorgio Ronchi, Memorex chairman and CEO, which, if successful, would result in the acquisition of Telex by Memorex.

Memorex and Telex had enjoyed a close relationship over the years. Indeed, Memorex bought out Telex's European operations in 1978, and many executives have experience of working for both organisations.

With this background, and the very obvious synergies between the two organisations, it was decided to examine the possibilities.

While the initial ideas were being discussed, the world's financial markets collapsed on October 19th, a day which came to be known as "black Monday".

On October 23rd the Memorex and Telex management boards met in New York to discuss the situation formally.

Approximately one month later Edelman and his group reviewed their offer to the Telex shareholders, in light of the international money market situation. They appeared to be having difficulty in raising the capital required to buy Telex.

Around this time the financial institutions of JP Morgan and Drexel, Burnham, Lambert advised the Memorex board that it would be possible to finance the proposed transaction.

Primarily the financing would be done through the same channels the management buyout used one year earlier. Memorex had proved itself in its first year, and the growth potential and opportunities that could be foreseen for a merged Memorex and Telex were enough to enable Memorex to put together a \$1150 million takeover package with investment and financial institutions around the world.

The first week-end in December saw the Telex board analyzing the Memorex offer of \$62 per share. This was made up of \$56 in cash and \$6 in preferred stock.

On December 7th the first official announcement of the proposed transaction was made to the press, and on December 14th the Telex board accepted the Memorex offer, recommending it to their shareholders.

The tender offer announcement was made five days later on December 19th with a date of the 21st January 1988 for the tendering of at least 90% of Telex stock to be completed.

By the end of January, Memorex had completed the purchase of approximately 90% of the outstanding Telex Common Stock by means of a tender offer at a price of \$62 per share net to the seller in cash.

In June 1988 it was announced that the merger of The Telex Corporation with a subsidiary of Memorex Telex NV had been consummated.

It was announced that the newly merged parent company would be called Memorex Telex NV, under chairman and CEO Giorgio Ronchi.

## SECTION 2

**MEMOREX TELEX :**

**MARKETS**

**AND**

**PRODUCT AREAS**

## MEMOREX TELEX INTELLIGENT SYSTEMS

Memorex Telex Intelligent Systems, based in Tulsa, Oklahoma, USA was established to design, manufacture and source viable intelligent workstation based products for each country in which the company markets its products.

It forms the mainstay of Memorex Telex's commitment to becoming a leading supplier of intelligent workstation products in the 3270 and System/3X marketplaces.

The market for intelligent workstations and terminals is quite different. As a result, two distinct markets are emerging - a low function non-intelligent terminal market and a higher function intelligent device market. The traditional market for terminals has been data entry and limited mainframe interaction. However, intelligent workstations provide an alternative for those users who require more processing power than is provided in the traditional terminal.

Market data shows that more and more users have chosen intelligent workstations for business applications in the last three years, as opposed to "dumb" terminals.

Unlike typical intelligent workstation vendors, Memorex Telex prides itself on offering "total system solutions" rather than "boxes", focussing its attention on "PC connectivity" solutions targetted at the 3270, System/3X and to the LAN markets.

Today's 3270 and S/3X users are not just demanding host communications, they require local computing power, in addition to their need for host-based communication via coaxial and twinaxial technologies. The Memorex Telex 7000 series, which includes six workstations, a variety of applications and communications software, and a complement of connectivity products, has been designed to meet these user requirements. These systems offer today's most important capabilities - complete 3270 and S/3X communications functions, full IBM compatibility, and a path to IBM PS/2 compatibility.

The Memorex Telex Intelligent Systems product line today offers the workstation user a complete product line ranging from a low end 8088 processor based workstation to a high-performance 80386 processor based desktop system, all of which are available for intelligent workstation to host communications. Within that product range are also diskless workstations known as LAN (Local Area Network) workstations which have earned the company a 6% market share of the growing 'diskless PC' segment of the workstation market.

For Memorex Telex, both the PC and PC to host communication markets will provide the necessary backdrop for our intelligent systems. The US market, as well as the international markets, offer excellent potential for sales of the intelligent systems.

Prior to 1988 the combined installed base of the two independent companies was 30,000 intelligent workstations world wide. In the first six months of this year the installed base increased by 65%, or some 20,000 units.

The Memorex Telex intelligent systems products generated \$74 million in revenues prior to 1988. In the first six months of this year the company already achieved 87% of the previous year's results.

The merging of the two product lines and resources has obviously already had a major positive impact on Memorex Telex intelligent systems sales.

Market data shows that 25% of all PCs sold to the business sector world wide in 1987 were connected to local area networks.

The company estimates that 15% of its projected shipments of over 95,000 intelligent workstations in 1989 will be connected to local area networks. That estimate increases to 20% of shipments of 210,000 in 1990 and 25% of 342,000 in 1991.

A key ingredient in the success of the Memorex Telex intelligent systems product line will be the LAN products which will be announced at the end of fiscal year 1988. These products are expected to generate \$27 million revenue in 1989, over \$58 million revenue in 1990 and over \$80 million in 1991.



These shipment projections show a market share penetration by the company of 1% of total worldwide PC shipments to the business sector in 1989, 2% in 1990 and 3% in 1991.

## 3270 NETWORKS

One of Memorex Telex's principal strengths is its well established presence in the 3270 market worldwide.

During the fiscal year 1987 Memorex Telex secured approximately 20% of the worldwide 3270 business, which represented revenues in excess of \$650 million. The company projects that this will grow to a market share of 23% during 1988.

All of the company's international activity, in terms of 3270 product offerings, and the development of its market penetration, is the responsibility of the Memorex Telex 3270 Networks business unit based in Raleigh, North Carolina.

This unit has recently expanded the company's ample product line with a broad range of 3270 products, including ten display stations, four printers, six control units, and an IBM compatible token-ring gateway.

Over 200 engineers, working in close proximity with more than 800 manufacturing personnel and a strong marketing team, are located in the Raleigh facility, which was established in 1970.

State-of-the-art manufacturing techniques, including automated assembly lines, paperless factory tracking, and "just in time" material control systems have paved the way for increased product quality and reliability through advanced technology.

Memorex Telex engineers at Raleigh integrate the latest technologies, such as surface mount technology (SMT), and application specific integrated circuits (ASIC), into their new product designs. Over the past six years, the use of these technologies has driven product costs down by an average of 10% per year. For example, the integrated circuit count for display products has dropped 33% per year from 1984 to 1988.

Memorex Telex's policy of flexible product sourcing is perhaps best demonstrated by the 3270 Networks business unit. Apart from its own extensive manufacturing resources, the company is able to pick and choose the very best 3270 products and systems from the world's other leading sources, as and when technological advances are made.

The Memorex Telex 3270 Networks group provides complete product support to 27 countries, by offering a comprehensive range of compatible peripherals with a strong focus toward future extensions to the 3270 business.

To capitalize on the growing market for increased intelligence at the device level, intelligent 3270 workstations are being developed. By incorporating Memorex Telex software, 3270 workstations will provide multiple sessions and multiple host applications utilizing sophisticated colour graphics, new printers and terminals. Today's development work will enhance the product line further in areas such as networking features and new terminal functions.

The existing range successful 3270 printer products will be augmented with state-of-the-art non impact printer technology. Current products range from matrix printers for high volume output to laser printers for letter quality office applications. New printer products will expand printer paper handling flexibility and will offer merging of text and APA graphics, as well as the ability to create forms, graphs, and overlays.

Future controller offerings will build on the success of current models, which offer more features than similar IBM models. New control units will provide increased networking capabilities, including enhanced token-ring connectivity, gateway and server functions for local area networks, and fibre-optic links.

3270 displays will reinforce their strong current market share with higher speed colour monitors supporting newly developed applications. Faster circuitry, larger memory, and the continued integration of ASIC and SMT technologies will continue to reduce the costs and power needs for display products, while increasing reliability and video presentation quality.

With double digit growth rates projected for the 3270 environment between 1988 and 1992, the 3270 Networks business unit is well equipped to build on its strong presence in the worldwide market with further expansion in all 3270 related areas.

## LSS (LARGE STORAGE SYSTEMS)

The efficiency and effectiveness of any mainframe computer installation depends to a large extent on the manner in which the actual data in the system is stored, handled and accessed.

The performance and utilization of a CPU ( central processing unit) is generally dependent upon the performance capabilities of its attendant storage and retrieval systems.

It is these critical devices and systems that form the basis of the product offerings from the Memorex Telex large storage systems (LSS) KOB.

So successful has this division been in the industry that Memorex Telex has established itself as one of the world's leading independent suppliers of storage technologies in the IBM environment. The products managed by this arm of the company account for a global turnover of between 400 and 500 million dollars per annum, maintenance included.

Based in Milan, Italy, the LSS group is responsible for all aspects of the extensive Memorex Telex large system storage product areas, apart from actually selling them on to the end user. (This is the responsibility of the individual country operations).

The KOB's role includes everything from global market analysis to product identification, product validation, marketing support and the conclusion of agreements with identified OEM (Original Equipment Manufacturer) vendors.

This does not mean that the company simply buys products 'off the shelf' from a manufacturer. Memorex Telex research and development engineers work in conjunction with the world's leading manufacturers, developing and refining advances in storage technology, and ensuring interfaces are available for true plug compatibility.

In this manner the company is able to provide a comprehensive product line covering all aspects of the industry and user needs, incorporating the very latest developments in storage technology from a variety of the best sources around the world.

This gives customers the opportunity to source their storage requirements from outside the product range of the mainframe supplier, with systems that improve upon, or match, those of mainframe suppliers, and which are fully compatible with their systems and environments.

The basic market sectors can be classified as follows:-

**Disk storage**; which today is principally based on Winchester and thin film magnetic recording technology, new developments coming will lead the way for optical disk storage which will complement magnetic storage.

Current technologies in this area are still largely represented by rotating magnetic storage devices - ie disk drives, an area in which Memorex Telex is very experienced, while the company's successful solid state disk devices account for the balance.

Memorex Telex is a major contender in the medium speed disk market with the 3380-compatible product line, from a single density high speed drive, to the double density unit, while a triple density version, the 3890, is due to be announced very soon.

Memorex Telex is currently focussing on the disk drive sector for medium to large systems users, and this will remain the company's major effort in the immediate future. But the recent introduction of several key Memorex Telex products, such as the new rack mounted 3835 compatible disk drives for systems in the S/38, 9370 and new AS/400 (Silverlake) classes., also confirms Memorex Telex's commitment to the medium range user.

In the magnetic disk drive area we expect to see many developments in different directions.

As far as medium to long term developments are regarded, the company envisages a new disk storage architecture. A further opportunity will be parallel read/write operations, with many heads operating at the same time on different tracks and providing tremendous advantages in terms of speed and transfer rate and the possible entry of optical storage.

**Archival storage;** is addressed by disk drive technologies, as well as by open reel tape and cartridge drives.

The company is rapidly increasing its penetration into this market sector with several new and exciting product offerings.

Memorex Telex will expand its current cartridge tape offering in the 3480 market with higher performance for its 5480 cartridge tape and this year (1988) has seen the announcement of a state-of-the-art automated tape cartridge library, the ATL 5400.

This high performance system will allow users to store large quantities of 3480 compatible cartridge tapes, and then access them completely automatically. The benefits to a large installation, in terms of efficiency, speed of operation and cost savings, will be immense.

**Semiconductor memories;** these are used in the CPU, in solid state disk devices and in disk cache memories.

Today Memorex Telex does not directly sell semiconductor products in the 309X main memory or expanded memory area - although these devices can be provided through the brokerage division. However, the company offers the highly flexible range of 6890 state-of-the-art solid state DASD products.

The company also offers disk cache and intelligent disk controllers, such as the newly announced 3888-23 control unit.

**Software products;** the LSS division also has the responsibility for the sourcing and supply of a range of software products to the large system user for improving the overall system productivity and cost effectiveness.

These software products enable systems engineers to determine the most efficient and effective utilization of a customer's storage equipment and systems.

Products currently available include capacity management tools for disk cache storage analysis, disk storage utilization, multiple command session management and online hardware error reporting. The company has announced a proprietary software package to accompany its new ATL 5400, which will provide it with a complete range of advanced library facilities.

**System printers;** in addition to supplying the actual storage systems and devices that are imperative to the efficient running of any mainframe based DP operation, Memorex Telex also offers users a range of system printers.

Utilizing both impact and non impact technology, these printers cater for users' high performance, high capacity requirements.

This area of the DP industry is one in which the company is keen to expand.

Memorex Telex's presence in the large printer market was, in the recent past, centred on the 430X family of printers with 1200 to 1500 lines per minute (lpm) speeds. While this is still a strong product in its class, the company foresees a very interesting future in the non impact area, where it already has the 4390 magnetographic 90 pages per minute (ppm) printer, and the new cut sheet ion-deposition 80 ppm 4780.

Memorex Telex has identified three different market layers both in fan fold and cut sheet non impact printer markets; low speed 20 to 50 ppm, medium speed 60 to 90 ppm and finally high speed , typically over 100 ppm. By the end of 1988 Memorex Telex will have a substantial presence in most of these sectors.

There is an impressive programme of future announcements in the pipeline for this specific market.



At the high end, a high speed fan fold laser printer, the 4800, has already been launched in selected key markets, namely the UK and Japan. Other products will follow in the medium to high speed range, with both fan fold and cut sheet paper handling capability. Memorex Telex is also investigating opportunities in departmental, or distributed, laser printers in the 40 ppm area, as well as in peripherals with advanced functions like advanced graphics and duplex printing.

Memorex Telex is committed to becoming one of the most successful players in the non impact printer market in a very short period of time.

## OPTICAL STORAGE

Memorex Telex's policy of flexible product sourcing puts it in an enviable position with regard to the optical storage market. The company's own experts, paired with the resources of the world's technology leaders in this field, are all available. This will ensure that, when the company enters this exciting new area, the product offerings will be, state-of-the-art. A good deal of groundwork has already been completed by the company.

### The technology

After a decade of research, optical recording is at last entering the information industry market place for data storage.

Although several key technical and commercial issues still remain to be resolved, it is already clear that this technology will earn itself a significant share of the computer storage market.

Memorex Telex has carried out several market surveys around the world, meeting customers and market analysts. These show that there is a very great interest in exploiting the advantages of optical disk technology.

The major reason for the excitement generated by optical technology is in the amount of data it is possible to store on such a small disk and the speed with which it can be accessed. Both of these benefits are probably the most critical criteria in any data storage product application.

Optical products can be ten to 40 times more powerful than magnetic technology, in terms of density (storage capacity). In addition, they also offer lower unit storage costs and greater durability.

At present there are three main types of optical disks;

i) compact disks/ read only memory disks (CD-ROM), which can be read but not written over.

ii) WORM disks (write once read many), which can record large amounts of data, but users cannot make any changes. Their possible archival-type applications are diverse in complexity and size, spanning many areas.

iii) Erasable disks. These combine the large capacity offered by optical storage with the reusability most users demand. These are expected on the market in limited quantities by the end of 1989 or early 1990.

The method by which the actual data is stored on the disk varies, depending on the type of technology employed.

### **The market**

The archival capabilities of optical storage are almost unlimited. Customer interest is closely related to the application needs. These needs include, but are by no means limited to, several vertical market sectors such as scientific, publishing and government.

Customer applications can include graphics, CAD/CAM, document storage and retrieval, and archival storage which would all benefit from the introduction of optical technology.

Today, this latter application is exclusively the domain of magnetic tape, micro-film or paper; but records archived in these ways are not quickly accessible or machine readable.

Optical storage technology fits in well wherever large amounts of data must be stored and no updating is required. This is, in many cases, a limitation of the WORM technology, but for certain functions this unchangeable factor is a major strength. In particular, for financial records or personnel data where security is of paramount importance.

Another factor in the equation of old technology versus new is in the longevity of the optical media, the commonly accepted life span being over 30 years.

Large storage capacities, fast access times, secure information, physically small and easily managed media, plus its in-built longevity make optical storage ideal for many vertical markets such as; library applications, patents records, military management, legislation tracking, the energy industry, geological data, pipeline information and power plant specifications etc.

In addition, there are many common business activities which could also benefit from the introduction of optical storage; activities which require large amounts of data to be stored and accessed from time to time, but not necessarily with any degree of frequency. These include contract handling, legal functions, financial reports, skill inventory, drawing registry etc.

These are merely some of the possible applications for the non-erasable optical disks which are beginning to appear now. Erasable disks have yet to appear, so until we see what they can do in terms of speed, cost and flexibility, it is difficult to predict what market areas will be their strong points.

Low end and mid range optical disk systems have had a very good market penetration; IBM's introduction of the model 3363, a 5.25" WORM device, was the most significant event of 1987 in the optical arena, because it gave "the stamp of approval" to optical storage technology.

WORM drives are now becoming more common place computer peripherals, with other major manufacturers also introducing optical drives in their computer systems.

## S/3X ENVIRONMENT

The S/3X market area is based around the IBM System /36 and /38 computer environments. These machines are seen as midrange products which fill the gap between small independent desk top processors and the large mainframe installations, as such the potential total market for this sector is very large.

Customers in this market sector range from the smaller individual company which has a requirement for a centrally based host computer, to a branch office of a large multi-national corporation which needs sophisticated systems and computer architecture, but which cannot justify a large mainframe installation.

The recent announcement by IBM of the new S/3X replacement/development - the AS/400 or Silverlake - and "Big Blue's" obvious commitment to this market sector is seen by Memorex Telex as very good news. It will present the company with excellent opportunities to expand its current S/3X business base and develop this sector into a major growth area.

Memorex Telex expects this S/3X - AS/400 sector to grow rapidly over the next five to ten years as the benefits of the AS/400 and its developments come through.

The /3X group, based in Paris, in just one year of operation in the S/3X market, established a sizeable presence with its range of highly competitive compatible products, a presence which generated around \$84 million in revenues during 1987.

Products include impact and non impact printers, expanded capacity storage devices, tape streamers, devices to improve and upgrade the performance and memory of the system, and a selection of displays, terminals and intelligent workstations.

Memorex Telex is, in fact, the only non IBM supplier in this market which can offer a complete product basket of storage and communications products.

An aggressive programme of product development and introduction has been implemented by the company in order to be in the very best position possible to take advantage of market opportunities.

In the light of this, Memorex Telex, as the world's number one compatible supplier, is confident of large scale success in providing the AS/400 - S/3X user with the products, added performance and support required.

## MEMOREX COMPUTER SUPPLIES

Memorex Telex's most widely distributed products are its comprehensive range of computer supplies, which are marketed under the MEMOREX brand name by the Memorex Computer Supplies group.

Based in Milpitas, California this group generated some \$210 million in revenues worldwide during 1987.

Back in 1961 Memorex started life manufacturing computer tape, and this is still a part of the company's activities today. From its early days above a garage in Mountain View, Memorex, and now Memorex Telex, has continued to be a leader in the development of magnetic media products.

In addition, the company has added a broad range of computer supplies and accessories, building on its international distribution channels and excellent brand reputation.

The range of magnetic media products available today includes reel-to-reel tape for such applications as geoseismic and instrumentation archival storage, tape cartridges, a vast range of flexible disks, disk packs and disk cartridges.

Other products supplied through this division include printer ribbons, toners, paper products, cleaning kits, plus accessories such as storage systems, power protection systems, cables and plugs, furniture and PC accessories.

Memorex Computer Supplies markets its products via a variety of methods - a direct sales force, a comprehensive direct mail catalogue backed by a dedicated telesales operation, a network of distributors, mass merchants, office supplies retailers and computer speciality stores.

Customers for this division cover the complete spectrum of computer users world wide from massive multi-mainframe sites to the hobbyist at home.

From this existing, and potential, customer base, the aim of Memorex Computer Supplies is simple - to be the largest, most profitable supplies organisation in the computer world. Whenever a user needs supplies or accessories for his computer, Memorex must be the obvious choice for value and quality.



## MEMOREX TELEX SERVICES

The division within the company that has global responsibility for ensuring the excellence of Memorex Telex's service and support operations is Memorex Telex Services, based in Milpitas, California.

So successful is the company's service operation that it generated around \$434 million in revenue during 1987.

Globally the company has over 3,800 dedicated customer engineers working out of strategically located spares and distribution centres.

Each of these engineers is backed up by local and international databanks of constantly updated information regarding Memorex Telex equipment and relevant competitive devices, plus the environments in which it is installed.

The information is gathered both from the company's own ongoing worldwide experience and that of others in the industry. Using such facilities as satellite communications links, shared computing resources and other channels, all of this invaluable data is available to every engineer throughout the world.

In this way individual engineers are able to call on the combined experience and knowledge of their colleagues.

In addition to providing both routine and corrective maintenance on Memorex Telex equipment throughout the world, the company's engineers also provide maintenance on installations of other manufacturers' systems.

This area of third party maintenance is a fast growing part of the group's business. The engineering teams bring the same high level of expertise and response to the support of non-Memorex Telex equipment that the company's own customer locations enjoy.

## LEASING AND BROKERAGE

Memorex Telex entered the leasing and brokerage business in 1987 with the acquisition of Continental Leasing. The company wanted to be able to offer customers and users as broad a base of product sourcing as possible.

This division is able to supply all of a customer's requirements from a mainframe CPU downwards.

A number of companies around the world have fixed buying policies which dictate their selection of equipment. Others may have a specific requirement at a particular time which Memorex Telex is unable to supply through its own product range. Some customers may also have particular financing needs.

The leasing and brokerage division is able to satisfy all of these requirements and also supplies existing customers who are looking for a mix of Memorex Telex equipment with that of other manufacturers.

This division, which is based in Paris, enables Memorex Telex to provide equipment, systems or products to customers, irrespective of the origin of that equipment.

In addition, the global organisation is able to source products for customers who, on occasion, are looking for specific non-Memorex Telex equipment.

As part of its total service, Memorex Telex also offers package lease arrangements for those customers who are looking for this method of securing the data processing equipment they need.

## MEMOREX TELEX SYSTEMS

Memorex Telex Systems, which is based in Tulsa, Oklahoma, has responsibility for bringing information and communication systems solutions to specialised vertical markets throughout the world.

The main areas of activity for this highly successful division of the company are in airline systems, telephony and the supply of OEM tape drives.

**Airline systems:** Memorex Telex airline systems equipment is used throughout the world by over 230 airlines for passenger handling and reservation system applications.

The product range includes specialized terminals and intelligent workstations, controllers and printers along with dedicated software packages, all customized to the specific requirements of the travel related industry.

Applications range from reservation terminals to flight display information, from bag tagging printers to multiple display intelligent workstations.

Along with many other sectors of the computer market, the airline customers are moving more and more towards localised computing power with intelligent workstations. Memorex Telex's experience in this field allows the company to access product lines from within its own organisation and customize them to the travel industry's specific requirements.

With a market share in excess of 30% in this field, Memorex Telex generated \$150 million in revenues from its airline activities during 1987. And with many new products in the pipeline, allied with the company's excellent rapport and track record with the industry's major buyers, Memorex Telex is confident that this business sector will be a major success story for the merged company.

**Telephony:** Memorex Telex Systems also markets a wide range of PBX (Private Branch Exchange) telephony systems.

These products are primarily distributed within the US commercial, financial and industrial markets and currently account for approximately 1.5% of that huge market. Annual revenues from this division are in the region of \$65 million.

Based around the TELEX 1001 range of digital, computerised, private branch exchanges, which can carry both voice and data, the company offers a comprehensive suite of products from handsets to exchange switches.

The division's compatibility with the rest of the company's activities lies in the growing requirement for "one stop" communications shopping. More customers are now demanding that a supplier be able to provide them with total communications links, from linking their computer systems together to providing voice and data links with the outside world as well as their own operations.

**OEM tape drives:** Within the worldwide OEM tape drive market, Memorex Telex is major supplier of OEM devices to the world's leading minicomputer customers.

The company's high performance tape subsystems provide an outstanding price/performance ratio, whilst at the same time being a highly profitable sector of the company's business.

State-of-the-art technology is incorporated into the tape drives, and such features as advanced self diagnostics and well designed user friendly interfaces have earned the company a highly respected reputation and field reliability record.

Memorex Telex expects this division to increase its penetration of this sector over the coming years.

## TELEX COMMUNICATIONS INC

Within Memorex Telex, Telex Communications Inc. (TCI) operates as stand-alone subsidiary.

Based in Minneapolis, Minnesota, TCI produces and markets a range of electronic and communication devices for specialized niche markets in four key areas;

- i) education and training,
- ii) hearing instruments,
- iii) communication accessories,
- iv) industrial and military antennas.

During 1987 this subsidiary of Memorex Telex had revenues of \$89 million from these four business areas.

Marketing its products under the "TELEX" and other brand names , TCI has established a reputation within its markets for innovative product design and quality performance.

The company offers a wide range of products across its four business sectors, including wireless microphones and headsets, (these have been chosen by the NFL - National Football League - in America as official equipment for all 28 teams in the league), headsets for aviators, intercom systems, industry - leading hearing aid technology, audio-visual presentation equipment and military and civilian communication antennas.

## SECTION 3

**MEMOREX TELEX :**

**PEOPLE**

**AND**

**CONTACTS**

**EXECUTIVE PROFILES****Giorgio Ronchi**

<b>Position</b>	Chairman and CEO Memorex Telex NV
<b>Date of birth</b>	11th February 1946
<b>Education</b>	US High school Istituto Feltrinelli, Milan Italy.
<b>History</b>	
1986 - 1987	President and CEO Memorex International NV
June 1980 - 1986	Memorex International Regional VP, responsible for France, Italy, Spain, Canada, Switzerland, Brazil, Mexico, Puerto Rico, Venezuela.
Feb 1975 - June 1980	General manager, Memorex Italy
Sept 1969 - Feb 1975	Dep Gen Manager, Memorex Italy
Nov 1969 - Sept 1974	Memorex Italy Customer engineering manager
1965 - 1969	IBM Italy Customer engineer specialist instructor

**Jean-Claude Zanolli**

Position Executive vice president  
marketing and business  
development

Date of birth 20th June 1944

## History

1979 - 1986 Country manager Memorex France  
1976 - 1979 International marketing manager  
Memorex International  
1972 Joined Memorex  
France  
1965 - 1972 Singer Friden (computer  
division)

**Richard Clarke**

Position Executive vice president,  
finance and administration

Date of birth 9th July 1943

Education BA Honours law - Magdalen  
College, Oxford  
1968 admitted as a solicitor  
Master of law, SMU, Dallas, Texas

## History

May 1981 - 1986 Director legal Memorex  
International  
1980 Group exec John Brown Group  
1975 European counsel GD Searle and  
Co  
1972 Contracts manager - Texas Inst  
1970 Legal adviser - Monsanto  
Europe  
1968 Legal adviser - Monsanto Ltd



**Stephen J Jatras**

Position Vice chairman Memorex Telex NV

Education MA electrical engineering MIT  
Sloan Fellow at Stanford  
Graduate School of Business

**History**

1948 - 1950 Instructor at MIT in electrical  
engineering  
1950 - 1952 Research engineer MIT  
1952 - 1956 VP and chief engineer Midwestern  
Inst Inc  
1956 - 1965 Several management posts at  
Lockheed Electronic and  
Lockheed Aircraft  
1965 - 1966 Joined Telex as president  
Midwestern Inst subsidiary  
1966 - 1986 President The Telex Corp.

**George Bragg**

Position	President and CEO Memorex Telex Corporation
Education	BS in business admin US Army Counter Intelligence Corps, Germany One year Free Univ of Berlin Graduate School of Economics Academic work completed for Masters degree in Economics from Univ of S California Exec mangement program, UCLA's graduate school of business
History	
1959 - 1968	Senior financial analyst North American Aviation
1968 -1971	Exec director of corporate development, North American Aviation
1971 - 1973	Founder and president, Personal Real Estate, development and investment firm
1973 - 1974	Director of business development Collins Radio Company
1974 - 1981	Memorex Corporation Vice president corporate development Chairman, Memorex Finance Co Chairman, MDIC Chairman, Memorex Mini Disk Drive Inc Member, Memorex corporate operating committee
1981	President and CEO Telex Computer Products Inc
1983	Elected to board of directors of The Telex Corporation
1986	President and CEO The Telex Corporation.

## HOW TO CONTACT MEMOREX TELEX

**Names of senior executives to be contacted for specific subjects related to the business activities of Memorex Telex.**

**General press contact** **Telephone number**

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London, England 01 759 2670

**Corporate affairs**

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Milan, Italy 010 392 452 9351

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Exec VP, finance and administration  
London, England 01 759 2670

Chris Ing  
Director of corporate communications  
London, England 01 759 2670

George Bragg  
President & CEO for USA operations  
Tulsa, Oklahoma, US 0101 918 627 1111

**Institutional relations**

Richard Fassino  
Director, banking and securities  
London, England 01 759 2670

**Computer supplies**

Sergio Mazza  
President, Memorex computer supplies  
Milpitas, Calif, US 0101 408 957 9470

**Intelligent systems/PC market**

Richard Slogrove  
VP Intelligent systems,  
Oklahoma, US 0101 918 627 1111

**Large storage systems**

Renato Cerutti  
VP LSS KOB, based in Milan 010 392 452 9351

**3270 market**

Doug Kendrick  
VP 3270 networks KOB,  
Raleigh, N Carolina

0101 919 890 1446

**/3X market (Incl AS/400)**

Jean-Jacques Roetynck  
VP /3X,  
Paris, France

010 331 47 60 85 00

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