

A BRIEF HISTORY OF THE MORKRUM COMPANY

Howard L. Krum
circa 1925

ABSTRACT

This is a first-hand report of Teletype's early years. Although the original manuscript was found unsigned and undated, it has been positively identified as the work of Mr. Howard L. Krum, son of Mr. Charles L. Krum, a co-founder of the original Morkrum Company. The date of writing seems to have been somewhere between 1925 and 1928.

The fame of Howard Krum does not depend on his illustrious parentage. His own contributions to the printing telegraph art, among them the invention of `_stop-start synchronization_`, were of lasting importance.

In the year 1902, Mr. Joy Morton, nationally known as the founder and head of the Morton Salt Company, became interested in the possibility of developing a printing telegraph system. He called Mr. Charles L. Krum, who was at that time Mechanical Engineer of the Western Cold Storage Company, into consultation on the matter. While cold storage seems rather a far cry from printing telegraph development, Mr. Krum had had considerable experience on the design of intricate mechanisms, including adding machines.

Inventors had been working on the development of printing telegraph for forty years prior to this time but had not succeeded in producing apparatus which was simple and practical enough to find any market or any considerable use by the communication systems in the United States. As is the case with most others who started work on printing telegraph, Mr. Krum was fascinated with the possibilities of this development, and Mr. Morton agreed to go ahead with the proposition and finance it. How important this decision was did not become apparent for many years, as certainly no one realized the vast sums of money and the years of hard work which would have to be expended before satisfactory printing telegraph apparatus would be produced and widespread use made of it.

In 1906, Mr. Howard Krum received his degree in electrical engineering and immediately started work with his father on this problem. The combination of the electrical engineer and the mechanical engineer proved to be a happy one and experiments were diligently prosecuted for a couple of years, until in 1908 a system was developed which looked good enough to try on an actual telegraph line. The first trial of this system was made on the lines of the Chicago & Alton Railroad. While operation was secured and the results were sufficiently satisfactory to cause the inventors to feel quite jubilant, still they were hard-headed enough to see the weak points of this system in the state of development in which it was at that time. The experience acquired in this actual line test of the apparatus was made the basis for

further research, and after two more years of work, the start-stop printing telegraph system which has become the basis for all successful single channel printer systems of the present day, was born. The apparatus which embodied the start-stop system at that time bore little resemblance to the present apparatus but the principles of operation were there and the working out of them was sufficiently satisfactory to justify a commercial installation.

In their pursuit of a satisfactory system of transmission, the mechanism for recording the signals was not neglected. Several different kinds of commercial typewriters were modified to perform the duty of recording the received signals, but strange as it may seem, it was found that commercial typewriters were not satisfactory for the rigorous job of recording telegraph signals. It was therefore found necessary to design a typewriter especially for this work.

These first tests also pointed out the advantages and superiority of mechanical over electrical operation, with a result that all functions outside of the bare selection are now performed mechanically by the Teletype in its present form.

Having finally produced a system and apparatus which they felt certain was commercially practical, the inventors were then faced with the necessity for finding a communication company who would permit the installation of this apparatus in regular commercial operation. The Postal Telegraph Company proved to be the most receptive and a committee headed by Mr. Minor M. Davis, at that time Electrical Engineer for the Postal Telegraph Company, visited Chicago to investigate this new Morkrum system. It is interesting to note that Mr. Davis, who had years of experience in the telegraph business and who had seen many attempts at the development of a successful printing telegraph system, was not so much concerned in the actual functioning of the recording apparatus but was more concerned in learning if the basis of the system, that is, the line signal, was of a type which would function on ordinary telegraph lines in good weather and bad. After a thorough investigation of the system, he became convinced that the start-stop line signal devised by the Krums would meet the rigorous service requirements, and the committee decided to permit an actual commercial installation on the Postal lines between New York and Boston. This installation was made in the summer of 1910.

After years of work, the inventors felt that they had finally reached their goal. The apparatus was packed and shipped and Mr. Howard Krum went to Boston to supervise the installation at that end of the circuit and Mr. Charles Krum went to New York to take care of the operations at that end. However, the difficulties were not yet over, for when the apparatus arrived at its destination it was found that due to rough handling the delicate instruments were so badly damaged that instead of proceeding with the installation they had to spend months of work to get the machines back in shape for operation. Finally the day came when everything was in readiness and the two sets, one at New York and one at Boston, were hooked together by a telegraph wire and the first commercial message was transmitted by the Morkrum system.

From the start good results were obtained, but as operation continued the inventors realized more and more that the operating requirements for commercial telegraph service were terribly exacting. The percentage of accuracy required was much higher than with any other form of mechanism; it must work twenty-four hours a day; it must operate on good telegraph wires and on telegraph wires whose quality was impaired by rain and other adverse weather conditions. The apparatus was too delicate to function over long periods of time without the necessity of close supervision. However, as in the case of the earlier installation, the inventors profited by their experience and went steadily along perfecting their apparatus, making changes here and there to improve its accuracy [and] to make it sturdier and simpler. Further Postal Telegraph lines were equipped and an installation was made on the Chicago, Burlington & Quincy Railroad between Chicago and Galesburg, Illinois.

However, in spite of the fact that these circuits gave good service, the growth of the business was very slow. Telegraph companies and the railroads seemed loath to adopt the new system. Possibly this slow growth in the early days of the Morkrum system was due to the fact that the telegraph companies and the railroads could easily secure good Morse operators at low wages. Therefore, they were loath to abandon Morse operation, concerning which they were thoroughly familiar, and to replace it with machine telegraphy which would force them to go to school all over again.

However, the telegraph business continued to grow and good Morse operators became harder to secure, wages increased, and above all, the Morkrum system steadily improved and finally installations of the system were made by the Western Union Telegraph Company, and the Canadian Pacific and Great Northwestern Telegraph companies in Canada. Due to increased business, Morkrum Company were able to enlarge their plant facilities, to engage expert assistants and to steadily improve their product.

In 1917, Mr. Sterling Morton, son of Mr. Joy Morton, who had had wide experience with the Morton Salt Company, became president of the Morkrum Company. Mr. Morton brought to the Morkrum Company not only his great organizing and executive ability, but also an unusual talent for machine design work. The page printer and the Simplex tape printer, which are the most widely used units at the present time, are the joint work of Mr. Morton and Mr. Howard Krum.

Up to this time, the laboratory and manufacturing work had been carried on in an old building near the business district. A careful survey of the employees showed that the majority of them lived on the north side of Chicago and this study determined the location of the present factory. In 1918, the factory was moved to the first unit of the present building, which is entirely fireproof and is considered one of the finest factory buildings in Chicago. Since that time, a total of six units have been built and a seventh is just being started. [1]

As the demand for printing telegraph apparatus grew, the standards were steadily raised and apparatus which was thought quite wonderful a few years previous

became obsolete and was replaced with newer types having greater margins of operation, higher speeds, and which were much simpler to maintain. Installations were made in new fields and each new field offered new and more difficult problems.

In 1914, Mr. Kent Cooper, who was then head of the Traffic Department of the Associated Press, became convinced that the method of delivering copy to the New York newspapers by messenger boy was decidedly unsatisfactory and asked the Morkrum Company if they could make an installation of their apparatus by which one operator in the Associated Press could transmit the press matter simultaneously to all of the newspapers in New York City. A simple problem in the light of our present-day knowledge, but at that time it was an undertaking which offered many problems as yet unsolved. However, it was undertaken; the problem was studied, suitable apparatus was designed and within a year all of the newspapers in New York City and nearby towns, as well as in Philadelphia, were receiving their press matter simultaneously from a transmitting set controlled by a single operator in the Associated Press office in New York City.

From this small beginning in the service of the Associated Press, the use of printing telegraphs has spread until over 800 newspapers belonging to the Associated Press receive their news dispatches by these machines, and some of the wire circuits of which this matter is transmitted involve as much as 4,000 miles of wire. The other press associations are using the apparatus to much the same extent.

Up to 1917, the Morkrum Company had devoted all their efforts to the design of single channel printing telegraph systems and had developed both direct keyboard and tape transmission, but at this time the Postal Telegraph Company asked the Morkrum Company to develop a Multiplex system to meet the requirements on their heavy trunk lines. This development was undertaken and in less than a year a satisfactory Multiplex system had been designed, manufactured and installed on the Postal Company's line and proved so valuable that its use was extended to all their main trunk lines.

As the use of printing telegraph became more general, needs developed for different types of apparatus to meet different classes of service, and the Morkrum Company attacked these problems and developed different types of apparatus until at present there are available both direct keyboard and perforated tape transmission systems, printing either on tape printers or page printers, operated either single channel or Multiplex, using either five-unit or six-unit code, the latter being especially valuable for stock quotation work.

The use of the apparatus in the telegraph companies continued to grow until at the present time fully 80% of all commercial telegrams are handled by printing telegraph. As the use of the machines grew, the requirements became more and more rigid and these were met by intensive research and development work which has never ceased. Printers are operating today under service conditions which would not have been considered possible even two or three years back. The latest development, the so-called "Typebar Tape Teletype" has proven so simple and reliable that it bids fair to drive Morse operation even from the way wires.

Always on the alert for new fields for its equipment, the Morkrum Company several years ago became convinced that its apparatus could render valuable service for the communication needs of business houses, factories, hotels, etc. To sell this idea required a lot of time and much hard work, and the first few installations proved that this service was much more exacting than the use of the machines in regular telegraph offices where expert maintenance was instantly available. The experience gained in these early commercial installations paid big dividends, in that it resulted in such marked improvement in the apparatus that the use has grown so that today there is scarcely a city or town in the United States where this apparatus is not used for some communication need outside of its primary field -- that of telegraphic message traffic.

The development of an organization that could satisfactorily handle the complex problems of developing and manufacturing a printing telegraph system has been quite as remarkable as the development of the apparatus itself; in fact, the successful culmination of the work would not have been possible had it not been for the splendid loyalty and intelligent work of the whole organization. This is particularly true in the case of the many men who had courage enough to stick to the proposition through the many years that it took before practical commercial results were obtained. The Morkrum Company is particularly proud of the fact that the outstanding men in the organization have developed in their own organization. It is a fixed policy of the company to develop its own men for important positions wherever possible.

Mr. Howard Krum met Mr. J. O. Carr, who is now head of the Sales Engineering Department, in Boston in 1910 and engaged him for testing and engineering work. About the same time, Mr. G. Heding, who is now Factory Manager, came to the company as a tool maker. During their long years of service these two men have filled practically every position of importance in the organization and much credit is due them for their part in the final success of the work. We believe there are few companies where such a large proportion of the men in supervisory positions have grown up with the company and developed as the company has developed and there are certainly few companies where there is a greater spirit of loyalty and co-operation.

Just a word about the manufacture of this apparatus. The requirements which printing telegraph apparatus must meet are extremely severe. This is readily understood when it is seen that when a printer is operating at the rate of 60 words per minute it is printing six characters per second. The printing of a character requires at least four successive operations of the various portions of the machine; in other words, many of these mechanisms have less than a twenty-fourth of a second in which to do their job. Coupled with this is the fact that the control of this rapidly moving mechanism is by means of a current of electricity so weak that it would hardly cause the smallest electric light globe to even glow.

Knowing this, it is easy to understand that continuous work and research must be carried on to secure proper alloys and devise the proper methods of heat treating and hardening to permit all of the parts of the machine to function properly.

Another requirement which is successfully met by Morkrum apparatus is absolute interchangeability of parts. This has been secured by the work of a force of highly trained designers and engineers and by the policy of the company of unhesitatingly securing the finest machine tool equipment available to permit parts to be made with the highest degree of accuracy. The present plant of the Morkrum-Kleinschmidt Corporation [2] at Chicago contains about 135,000 square feet of floor space devoted solely to the manufacture of this type of apparatus, filled with the best machine tool equipment that can be purchased and manned by a force of highly trained employees, many of whom have been in the service of the company for a great many years.

1. This would be the building at 1400 Wrightwood Ave., in Chicago which was occupied by Teletype until early in the 1960s, when the R&D portion of the complex at 5555 Touhy Ave., Skokie, was completed. I hear it has now been remodeled into luxury apartments.
2. E. E. Kleinschmidt had a competing printing telegraph company in the 1905-1920 time frame. His company eventually merged with the Morkrum company because of the dominance of the Krum patent on start-stop operation. In the 1950s Mr. Kleinschmidt got back into the business with his own company, located in Deerfield, IL.

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