The Creed Model 75 Teleprinter

Alan G. Hobbs, G8GOJ looks at another of Creed's fine machines.
Part of a series "Teleprinters I have known"

At the end of World War 2, Creed & Company's standard page teleprinter, the model 7 (see THJ 43), had been in production for almost a quarter of a century, and needed to be replaced with something rather more modern. As an interim measure, the basic model 7 was revamped with the latest receiving camshaft assembly fitted with a reperforating attachment, and enclosed in a new silencing cover. When the machine was launched in 1954 it was given the designation of model 54. It was a very nice, quiet, machine, and was used on many private networks, but it was a rather large machine. Anyway, this gave the company breathing space for the development of an all new machine, which was intended to be the basis for the next generation of Creed teleprinters.

When the Creed model 7 5 teleprinter entered commercial service in 1958, it was the smallest, fastest, lightest, and most versatile teleprinter in the world. It had already spent a number of years in development and trials, which included a pre-production model flying on BOAC airliners in 1956 in order to receive weather reports during the flight from London to New York.

As a measure of its versatility, the final model could be equipped with

- Receive only version
- Three or four row keyboards of an entirely new design
- Dual friction feed/sprocket feed platen
- Two colour printing to differentiate between the sent and received texts
- Tape reader attachment
- Tape punch attachment

- Twenty character answer back unit
- AC or DC governed motors for any commercial voltage
- 50Hz or 60Hz synchronous motors
- Operation at any standard signalling speed between 60 and 100 words per minute with separate gears for two other speeds stored within the machine
- Dual speed gearbox for 45/50 Bauds or 50/75 Bauds operation
- Operation to the International Telegraph Alphabet number 2, or any one of the many early 5 bit computer codes
- Single or double current serial signalling input
- Single or double current serial signalling output
- Serial and/or parallel signalling input
- Serial and/or parallel signalling output
- Automatic carriage return and line feed at the end of the received printed line
- Optional silencing cover in place of the standard dust cover

And all this in a volume only 18¼" wide, 17¼" deep, by 12¼" high, and a weight of 56 pounds. This reduction in physical size was as a result of several significant developments.

The first was to have a stationary paper platen and to move the printing mechanism, instead of keeping the type-head stationary and moving the paper platen past the typehead. This enabled the width of the machine to be significantly reduced. It also allowed oversize paper rolls to be mounted in the support desk, with the end of the paper fed into the machine through a rear slot in the cover, without the danger of the paper tearing due to the movement of the platen. Having a stationary paper roll also allowed the machine to operate in positions which were not level. Indeed, the model 75 has been demonstrated working whilst being held upside down. Quite a severe test for any machine!

The second was the development of the "aggregate motion" mechanism driven from the received character code, to position a small cylindrical type-head which would, itself, strike the ink-ribbon and paper, causing the character to be printed. This replaced the large rotating type-head and the fixed bell-crank selection mechanism of the earlier machines, together with the need for a separate type hammer.

The final significant development was the use of a single cam shaft to carry out all of the transmitter and receiver timing functions. This single cam shaft replaced the two cam shafts, together with their complicated gear trains, used on all of the previous Creed machines.

It is this latter development, the use of a single

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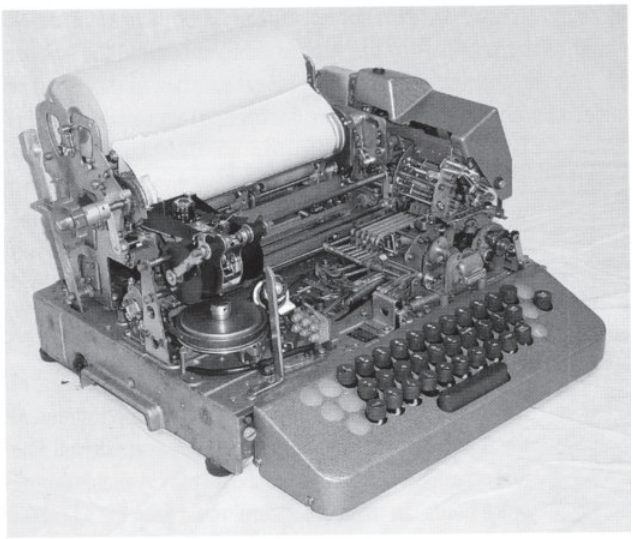
cam shaft, which is of the greatest interest. In all previous Creed machines, the keyboard transmitter and the receiver were completely independent electrically. The only common factor was the motive power for each being derived from the same electric motor to provide the overall machine timing. Without an external signalling supply, operation of the keyboard would simply have no effect on the receive mechanism. With the model 75, this changed dramatically. The output from the keyboard was fed directly into the translator unit of the machine, where it was decoded and caused a character to be printed, or a non-printing function to operate. At the same time, the character from the keyboard was transferred to the signalling contacts and transmitted to line, assuming that the signalling supply was connected.

Incoming signals received from line operated the polarised receive electromagnet in the usual manner, which tripped the cam shaft clutch, causing the signals to be sampled at the five correct instants. The results of this sampling were again transferred directly into the translator unit.

From this point on, the operation was the same as if the keyboard had been operated. It can, therefore, be seen that the machine automatically regenerated all signals received from line back out to line.

These two features caused consternation within the Post Office when the model 75 was offered for use in the Telex service. It had, hitherto, been a prime requirement that the "local record", i.e. the printout produced from the operation of the keyboard, was derived from the signals being sent to line, and all Telex subscribers apparatus and signalling systems had been designed with this in mind. Likewise, the automatic regeneration of received signals could cause other problems. Any electrical connection between the transmitter and the receiver of the model 75 could cause it to go into an oscillatory condition ad-infinitum. The model 75 is usually fitted with a "throw-out" device which can mechanically disconnect the receive electro-magnet when the machine is in transmit condition, but the adjustment of this device is very critical, and not particularly satisfactory in operation. The Post Office, therefore, rejected the model 75 for use in the Telex service although a version of the model 75, given the designation Teleprinter Number 12, was used on cordless Telex switchboards. Creed & Company did produce a limited run of a modified version of the model 75, known as the model 750, with separate transmit and receive cam shafts which was proposed to be used on the Telex network, but it was not a success and only a small number were built. However, the model 75 became very popular with operators of private networks, and the embryonic computer industry. This latter use generally used the parallel input feature, with the machine operating at its maximum speed of 10 characters per second. In certain applications the automatic regeneration feature, and the ability to provide an electrical parallel output signal for character recognition "stunt box" purposes, were both used to considerable advantage. A typical example was the Teleprinter Radio Selective Calling System that was installed in 1959, and which covered ten of the Caribbean group of islands. This ran from St. Kitts in the north to Trinidad in the south, using voice frequency signalling over VHF directional radio links. Machines on the network were held in the non-printing condition until their individual selective calling address (Selcall) was received. The message for that location would then be printed, and the machine returned to the non-printing condition.



As would be expected, the model 75 is significantly more complex than the previous generation of teleprinters, and requires very careful maintenance and lubrication if it is going to give good service over a long period of time. The first picture shows a general view of the model 75 with its cover removed, and the extreme compactness of the mechanism will be apparent from this view. Immediately behind the keyboard, is the series of six levers that transferred the chosen character from the keyboard directly into the translator mechanism and simultaneously tripped the translator clutch, so that the character could be printed and transmitted to line. Below this series of levers can be seen part of the aggregate motion which positions the typehead, and which is driven y a parallel output from the translator mechanism. The aggregate motion consists of six rods pushing against two sets of inter-connected levers, with several helical springs to keep them all in place. Code bits 1, 3, 4 and 5 combine to rotate the type head to one of 16 positions. Code bit 2, together with the "shift" (letters or figures) condition combine to lift the typehead to one of four levels. By this means, any one of 64 printing positions can be pre-

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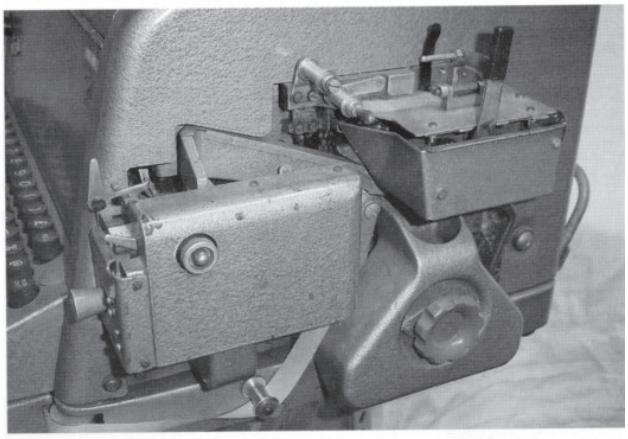
sented to the paper for printing. For code combinations that carry out non-printing mechanical functions, such as carriage return, line feed, letter space, all space, figures shift and letters shift, the typehead is prevented from striking the paper. The typehead itself, which carries the metal type pallets, is fabricated from a particular grade of a plastic bonded fabric laminate material manufactured by Messrs Formica Ltd. When this company heard about this application of one of their products, they were allowed to film the model 75 in action to use as part of one of their product advertising films.



When the model 75 was required to operate with perforated paper tape, the appropriate attachments were factory fitted onto the right hand side of the machine, as shown in the picture above. The perforator was fitted towards the front, with the tape reader fitted towards the rear, and the "Chad box" for the punchings from the paper tape was fitted underneath the tape reader. The punches in the perforator are positioned by the same part of the translator mechanism that positioned the aggregate motion, so that a tape could be perforated either direct from the keyboard, or from signals received from line. The 8" diameter reel of $^{11}/_{16}$" wide paper tape used to feed the perforator was housed in a plinth fitted underneath the machine. This plinth increased the height of the basic machine by $1^{5}/_{8}$"Paper tape exhaustion was signalled to the operator by permanently illuminating the end of line indicator lamp. This was in addition to the red marking printed on the tape itself near to its end.

The tape reader had a complicated set of transfer levers that sensed the combination in the perforated tape and positioned the combination bars in the keyboard in a similar manner to a key being operated. The code was then transferred into the translator in the usual manner. The tape reader incorporated facilities to stop the tape if it became taut, in order to avoid mutilating the feed holes, and also when the trailing end of the tape was reached. Both the perforator and reader could be fitted to receive only machines (i.e. without a keyboard) if required. but a dummy keyboard unit would have to be fitted to house the transfer levers. The motive power for operating both the perforator and the reader was derived directly from the main translator camshaft, which was fitted with the additional cams required.

The model 75 is a very interesting machine, which found favour with many Radio Amateurs because of its small size and versatility but, if any the translator mechanism went wrong, it could be a pig to work on!

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