Teleprinters I have Known – Alan G. Hobbs, G8GOJ

For a long time I have thought that the pages of the telecommunications history journals have, with a few exceptions, been over-represented by telephone related articles, and that it was time to redress the balance in favour of telegraphy, machine printing telegraphy to be precise. It is hoped that this subject will be of interest to the readers who have, perhaps, spent their working lives surrounded by telephones. But first, what are my CREEDentials for writing about such equipment?

My late Father was the Plant Engineer for Creed & Co., Ltd., of Croydon for nearly 30 years, until his retirement in the mid 1960s. It was Creeds, who, from the mid-1920s, designed and manufactured virtually all the teleprinters used in the UK by the Post Office, Railways, Newspapers, Armed Forces, Public Utilities and myriad commercial organisations, until the coming of the computer age finally put them out of use. As a young boy in the early 1950s I started to visit the factory during the two week "closed period" that took place during the summer school holidays. This was the time when all of the production staff took their holidays so that essential maintenance, and factory re-arrangements, could be carried out by my Father's staff without disrupting production. At first, the teleprinters that I saw on test were just a source of wonderment to me, but it was not long before I started to take a serious interest in them, and started to collect various maintenance manuals, and other documentation, that was being thrown away around the factory. In 1962, with the move of Creeds from Croydon to Brighton underway, I was finally able to acquire a teleprinter of my own. A model 47 (Post Office number 11) tape teleprinter, as then used in the Telegram service. This was rapidly followed by the acquisition of a model 6S/2 perforated paper tape reader, and a simple 80/0/80 volt power supply unit. A few simple connections and the model 47 was able to print out any perforated tape that I could lay my hands on, and there was a lot of it around!

In 1965 I discovered an organisation known as the British Amateur Radio Teleprinter Group (BARTG). This sounded just up my street, so I joined, and I have been a member ever since, rising to my current position of President. With assistance from one of the BARTG members I was able to locate an ex-Government Terminal Unit in a surplus shop in North London and, with suitable modifications, this was interfaced to an ex-Government communications receiver purchased from a friend at College, and the model 47 Teleprinter. I was now able to print all of the News Agencies that transmitted on the High Frequency (HF) radio bands, the likes of: AFP, Ima, PAP, Reuters, Tass, Xinhua, etc., etc. Many happy hours were spent printing these Agencies, with my bedroom floor covered in Y," wide paper tape at the end of an evening. I even started to print licensed Radio Amateurs using teleprinters, and this got me really fired up, leading to me getting my own Amateur Radio Licence, call-sign G8GQJ, in 1972. Now I could talk back! This licence gave me access to all the Amateur bands above 30MHz, and there were quite a few others using teleprinters on these bands with whom I could communicate. In recent times, changes to the Amateur Radio licensing structure have introduced additional classes of licence, and in January 2002 I obtained another Amateur Radio Licence, call-sign M3GOJ, which gives me access to virtually all the Amateur bands below 30MHz. The Radio Teleprinter Telegraphy (RTTY) mode is still very popular on the HF bands but, as far as I can tell, I am the only person in the world still using a mechanical teleprinter. Everyone else that I have contacted is using a computer with one of the various versions of teleprinter emulation software that are available. However, I still live in hope of finding another mechanical teleprinter operator.

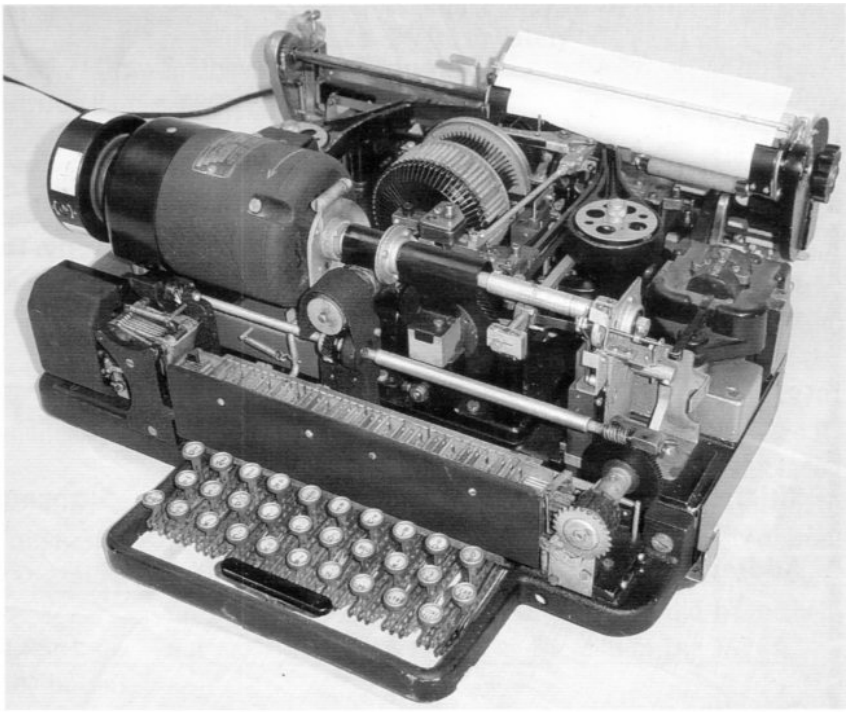
During the 40 years since I obtained my first teleprinter, I have owned a number of different machines. The model 47 was passed on to another Radio Amateur many years ago, but I have recently been able to acquire another example through the help of a friend. Many new teleprinters have been designed, entered production, and eventually ceased production during this time. However, like Strowger telephony, mechanical teleprinters are now another part of history, with just a small number left in the hands of Museums and private collectors.

It seems appropriate to start, what it is hoped will become an occasional series on teleprinters, with the Daddy of all teleprinters. The famous Creed model 7 page teleprinter. Whilst not the first teleprinter to be produced by Creeds it is, without doubt, the most well known of their machines, and is considered by some to be the teleprinter that helped to win World War 2. Many thousands of model 7s saw service with the Armed Forces, sending vital messages around the world, and sending top secret messages to and from the code breaking teams at Bletchley Park.

In the late 1920s the Post Office were already successfully using an earlier Creed machine, the

model 3 tape teleprinter, for the Inland Telegraph (Telegram) service. Thoughts were now turning to the introduction of a person-to-person Teleprinter Exchange (Telex) service, but there were no suitable machines available. The ideal would have been to place a standard commercial typewriter pewriter at each end of a telegraph wire, and cause them to operate one another. This cannot be done, as the keys of typewriter operate the typebars directly, but on a telegraph machine the operation of the keybars must generate telegraph signals and the typebars must operate under the control of the receiving magnet.

It would have been possible to use the type basket of one or other of the standard typewriters and to arrange this under the control of the receiving mechanism. But this would have involved the development of a machine of a totally different character from that already in use by the Post Office, i.e., the model 3 tape teleprinter. It was considered best to produce a machine as nearly as possible like the model 3, making only those



modifications which were necessary, and which experience with the model 3 had shown to be desirable. it was also required that the machine would print on standard width paper, just like a typewriter, and not on the narrow strip of paper used for the Telegram service. Operation was to be at the international signalling speed of 50 Bauds, (an element period of 20mS), and to use the International Telegraph Alphabet number 2 (ITA2). These, then, were the aims which led to the development of the model 7 teleprinter.

When the model 7 was finally introduced in 1931, it was a truly state-of-the-art machine. Printing was done on paper 8 wide, which was supplied in rolls 3 diameter, and was carried on the carriage within the machine. Typing was through an ink ribbon, as on a typewriter, instead of the ink rollers used on the model 3. Ball bearings were used on all high speed shafts, and oil cups were provided on all small bearings so that the machine was capable of at least 100 hours continuous operation without attention.

Communication could be effected with a machine in an office without a receiving operator being in attendance. This feature, known as the "Absent subscriber service", makes it necessary to provide a means which will enable the calling subscriber to verify that the correct connection has been made. For this purpose an "Answer Back" device was provided on the machine, which is arranged to send the exchange number of the called machine back to the calling subscriber whenever the calling subscriber depresses a particular key on the keyboard. A signalling device was provided which could be used for calling the attention of the person in another office to any urgent message received. It could be caused to ring a bell or light a lamp.

In order to simplify the manufacture and maintenance of the machine, it was built in units. The model 3 was arranged that portions could be readily removed, but was not designed so that it would be possible to remove a portion and replace it by a spare without re-adjustment being necessary The model 7 was designed so that this was possible, leading to reduced maintenance costs, and making it possible to effect field replacements in the shortest time. The automatic motor starting and stopping device was completely re-designed and provided with new facilities.

The general design of the machine was such that it could readily be adapted for any purpose within the range of start-stop telegraphy. This feature arises due to the keyboard unit and paper carriage being detachable from the receiving portion of the machine. Two types of carriage were provided, one suitable for printing on a tape, just like the model 3, and the other on a roll of paper.

During its production life of 38 years, over 101,000 model 7s were produced, in many different versions. The original version, the 7A, transmitted a 7 unit character, (i.e., I Start unit, 5 Code units, and 1 z Stop units) and had a 7 unit receive cycle. However, a CCIT (Comité Consultatif Internationale Télégraphique) recommendation was that the machine should be capable of correctly receiving and printing characters when each character is sent out as 7 equal units. That is, with a stop signal of only one unit, instead of the usual I '/, units. A re-design of the receive camshaft and its drive mechanism reduced the receive cycle to 6 V, units, and with

the original 7 % unit transmit cycle this machine became the model 7B. There was also a version with a 7 unit transmit cycle, still with the 6 , unit receive cycle, known as the model 7C. This machine tended to be used only on private wire networks where the shorter stop element produced a slightly higher throughput of information. This was equivalent to 71 words per minute for the model 7C at 50 Bauds, compared with 66 words per minute for the model 7B at 50 Bauds.

Later versions of the model 7 were introduced to provide the additional

facilities required by the Telex network, or to improve performance. The first variant was the model 7D, which incorporated a relay to signal to the controlling equipment when the motor had reached its governed speed. The model 7E incorporated a re-designed receiving cam shaft assembly, known as the overlap cam unit. With all earlier versions of the model 7, the received character was not actually printed until the next character was received. This was due to the limited time available with the 6 V, unit receiving cycle. The overlap cam unit overcame this limitation by means of three sequentially operated cams. The first cam included an "Orientation device" (some times called a "Range Finder") which allowed the sampling periods of the receive mechanism to be optimised to the incoming signal. The second cam carried out the received character sampling and processing as before, and the final cam caused the printing to be carried out whether or not another character was being received.

Any of these machines were available with the factory fitted Reperforating attachment, designated by VRP" after the machine description, e.g., 7E/ RE This attachment allowed the machine to produce a perforated paper tape of all incoming and outgoing messages or, when used off-line, to produce perforated tape for subsequent automatic transmission, rather than transmitting direct from the machine keyboard.

The final machine in the model 7 series was given the designation of model 54. This machine was introduced in 1954 as a deluxe version of the model 7E. It included a new style of keyboard having a much lighter

touch than the original model 7 keyboard, two colour printing to differentiate between the sent and received texts, with the whole machine being enclosed in a newly designed totally enclosing silencing cover. This was, indeed, a very nice machine, and I used a model 54/RP for a number of years before I passed it on to another Radio Amateur.

That concludes this brief history of the Creed model 7 teleprinter which, it is hoped, has introduced the delights of machine printing telegraphy to a wider audience.

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