Allied Signals preparations for D-Day

The invasion was also a massive task for the Allied Signals Corps. There was one scare when a copy of the complete signals plan for the D-Day invasion was left in a London taxi (a trick repeated in recent times by British intelligence officers). However, a day or so later the unopened plans were returned by the 'cabbie'; it's not known whether he ever appreciated the importance of the documents he found in the back of his cab. And later, after the invasion itself, there was another "first class cipher scare" when a lorry load of cipher "key material" went missing in northern France. The vital documents were eventually found below a bridge having been tipped into the stream.

In planning for the invasion one important consideration was to prepare for the restoration of cross-Channel cable communications. The cables had been cut in the early days of the war. For practical reasons to with the cables not being in the right place and for technical reasons, to do with the need for combining multiple teleprinter and telephone calls on a single cable, the old cables could not be re-used. However, it would take time to design and build replacement cables. "Meanwhile Russia was performing miracles in holding the Germans away from many of her vital areas and so giving us time to emerge from the processes of design and manufacture which occupied so many months."[i] When D-Day did come, the cables were ready, cable-laying operations started on D-Day+2 and used for communication from D-Day+3. Some time later, the signals corps was asked to provide a circuit from a headquarters in Norwich in England through to the command of the airborne operation, Varsity, which was to accompany a major crossing of the lower Rhine. The complete circuit was in operation within 24 hours of its request.[ii] Though, of course, not all circuits were available when people wanted them – one Bletchley Park official noted in exasperation, when a circuit needed for passing intercepted messages back to the Park was delayed, "Can't the Signals Corps even do a simple job like this!"

Teleprinter conferences became a standard tool during the planning, the invasion itself and its follow up. Well over 1000 teleprinter circuits were installed purely for the planning and build up phases, "which in peace time would have been more than adequate for a public telegraph service." And it was necessary to adopt the technology that had opened up the German army's strategic communications – directional or beamed radio. The use of multi-channel beamed radio circuits increased dramatically after the invasion, "partly because of 'pulse-modulated' equipment becoming available, partly because of improved performance obtainable as experience was gained and partly because of the speed with which skeleton communication services could be established by this means. … At times in war there can be more difference between no communications and just one circuit than there is later between one [circuit] and fifty, and even after the mass of wire had caught up, the radio earns its keep as a standby against breakdown or enemy action."[iii] This is, of course, similar to the pressures that led the Germans to adopt the use of beamed radio. One difference, however, is that the Allies adopted it when the technology was more advanced, and also they adopted it in the knowledge of how vulnerable it could be to interception. An indication of the advances in technology is the adoption of 'pulse-modulated' techniques, an application of Reeves's invention (see

chapter 3). This is based on digital transmission, rather than analogue as used on the German system. All the same, wherever possible cable was used instead of radio links even high-speed ones, for two good reasons, the possibility of interception and variable transmissions conditions which could cause poor reception.[iv]

The same issues that had confronted Germans, security traded off against flexibility and the sheer practical difficulties of using complex hand ciphers in action, also faced the Allies as they went onto the offensive. "Radio telegraphy is always more or less of a broadcast and liable to interception by the enemy. All messages have to be enciphered and deciphered, and these are time-consuming processes unless, exceptionally, special machines can be used which combine the ciphering processes mechanically with the actual transmission of the message from the keyboard. Such messages are appropriate only to first-class radio channels or to cable circuits in which the transmission of the message letter by letter achieves high accuracy … In addition to the telephone system, every headquarters signal office used teleprinter [linked via cables]. Radio telegraphy involved losing time in the ciphering and deciphering process, whereas teleprinter cable circuits were considered sufficiently safe from the possibility of being tapped for secret traffic to be sent in clear. Top secret messages, of course, were enciphered whatever method of transmission was used."[v]

[i] Harris, *Signal Venture*, 164
[ii] Harris, *Signal Venture*, 263
[iii] Harris, *Signal Venture*, 236; HW14/98 23-2-44; HW14/99 6/3/44; HW14/99 12/3/44; HW14/103 6/5/44
[iv] HW14/110 28/8/44
[v] Harris, *Signal Venture*, 190, 230; HW14/110 28/8/44 gives a flavour of the continuing cipher battles: "On 21 July 44 an unfortunate breach of cipher security occurred with [the Allied] 21 Army Group. A technical message in cipher sent by radio from one Sigint unit to another contained a few groups in clear, which, if read and understood by the enemy, would have indicated that it came from someone forecasting or dealing with call-sign forecasts. The radio link was closed as soon as the compromise was reported [and] emergency measures taken." Also, "From one PW [prisoner of war] it was learnt that the new medium grade cipher (RASTERSCHLUSSEL) is intended to replace Playfair only, and that its introduction has been postponed to 1 Sep 44."