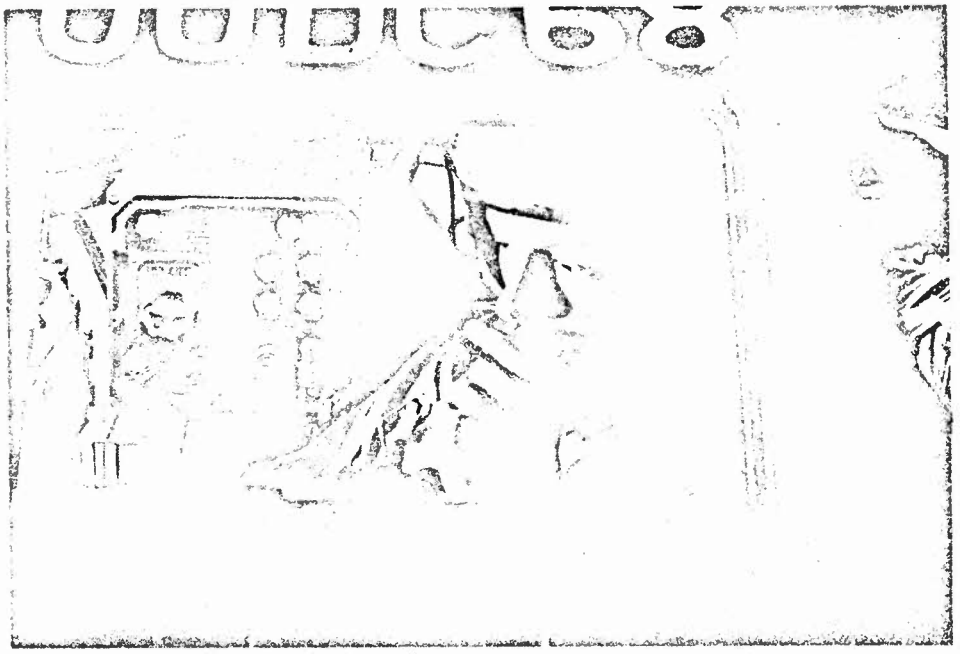
Technology

Triffids on the way—Ptarmigan follows

Elements of a new generation of British army communications equipment are beginning to take shape. New battlefield radios and switching equipment are already in production, foreshadowing the development of the Ptarmigan battlefield "STD" system expected in the early 1980s. The two key problems with which the new systems are contending are accidental jamming and the vulnerability of communications systems centred on a few military command posts.

Military radio equipment must obviously use compatible transmission methods, but must also face the problem of limited communication channels. When several radios are operated simultaneously at a command centre, there is a strong possibility of mutual interference if the frequencies are not carefully worked out in advance. The new Army series of radios—Clansman—have been designed to reduce the likelihood of nearby radios jamming each other. And to back this up, the Royal Signals Corps has developed an unusual form of battlefield "stores".

Using an IBM computer at the Blandford School of Signals, the Corps has prepared a continuous stock of acceptable frequency allocation plans, sufficient to last 30 days. To sort out frequency allocations can take a large computer up to seven hours, since it has to allocate perhaps 200 frequencies for each brigade. The British Army of the Rhine (BAOR), for which the system is primarily intended, has eight brigades plus other units. Since there are at most 1800 channels in the military VHF band, the problem is formidable, especially because these channels have to be shared with other NATO armies and civil services. According to one signals officer, "we need about three times the number of available frequencies". In a war enemy jamming—and the need to use the same frequencies as opposing forces—would make things even worse.



Clansman installed in an armoured personnel carrier

Clansman is now being stockpiled to prepare for a complete switchover to the new equipment. For a complete radio "net" one radio is needed for every four or five men, installed in vehicles or carried in backpacks.

Different systems are used to link the higher echelons of the command structure. Presently, BAOR uses a system called Bruin, in essence a mobile military version of a local dialling telephone network with radio links instead of cables. Bruin has 10 major switching centres tied to BAOR commands and through them to Britain and other NATO countries. But this is a real weakness of the system, as is the need to transport each major exchange around on about 20 container trucks.

In fact, Bruin was introduced in the 1960s partly as a stopgap when it became clear that a much more flexible area telecommunications system initially conceived in 1956 could not be developed in time. The area scheme—now called Ptarmigan—has a widely dispersed network of switching centres with multiple interconnections. The network can thus withstand the destruction or breakdown of any component without losing contact with any of its "subscribers".

Initially the scheme was to have been a joint venture between Britain, the United States, Canada, and Australia. But the joint effort, known as Mallard, fell apart in 1970, and Ptarmigan grew out of the ashes. Plessey is now developing the computer processing and switching for Ptarmigan, which will give each commander a unique telephone number independent of how he is connected to the network. This can be done either by each processor keeping a constant record of the shape of the network as it changes, or by signalling a call to all parts of the network when a "subscriber" is wanted. When complete, the system will perform like STD.

To connect the telephone switching centres, Marconi is manufacturing UHF radio relay links called Triffid. Delivery of £20 million worth of Triffids will start in 1977. Some 1500 Triffids will be used in conjunction with Ptarmigan. Marconi also supplies mobile message switching centres for battlefield use. The centres can switch up to 5000 messages a day between teleprinters in the field. The teleprinter message switchers, known as Tarif, will provide additional communications to back up Clansman.