Communication via PostMan on tactical Internet

PostMan DS100 – wireless TCP/IP and intelligent E-mail system

The success of any military operation depends to an increasing extent on full-coverage, fast and reliable communication. As a consequence, the enhancement of the communication systems has top priority for all military forces worldwide. Security experts even assume that the conflicts of the future will mainly be information warfare.
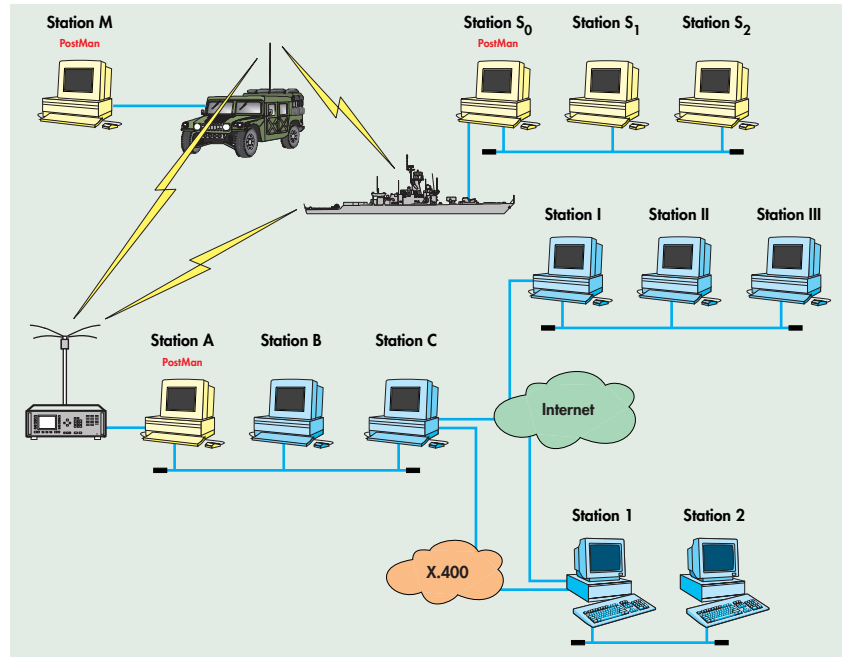

FIG 1   PostMan adds radiocommunication capability to international communication networks

Up to now the demands of the military command were implemented in special – mostly analog – communication networks. These, however, entail the great disadvantage that they are not interoperable or only to a limited extent due to the different proprietary protocols used. Among all these protocols the TCP/IP protocol is evolving as the international standard for data exchange across network borders. The TCP/IP protocol used worldwide on Internet or in X.400 networks guarantees interoperability on different computer platforms irrespective of manufacturer and operating system.

PostMan from Rohde & Schwarz is one of the first software products that enables transparent implementation of the TCP/IP protocol at the HF air

interface and so ensures unhindered gatewaying from wire to radiocommunication networks. For the first time, it is possible, for example, to exchange E-mails between any Internet address and a ship across thousands of kilometers (FIG 1: Station S – Station I). Even Internet surfing via shortwave with commercially available browsers is possible for every mobile station (FIG 1: Station M). Any TCP/IP-based application can be carried out via radio using PostMan which covers the whole of the HF/VHF/UHF band.

In some radio networks with regionally limited operation TCP/IP-based communications are already employed. PostMan allows these networks to be interconnected even across large distances to obtain a full-coverage

network. Within the framework of a trial at the material inspection agency of the US Army Communications Electronics Command (CECOM) this interoperability was tested using existing VHF/UHF data radio networks. Separately operating radio networks of the SINCGARS (Single Channel Ground and Airborne Radio System) and EPLRS (Enhanced Position Location Reporting System) type were interconnected by means of PostMan and data were exchanged across different radio links without any undesired interaction (FIG 2). PostMan not only links the individual radio networks but also enables access to wire communication networks as for example Secure Intranet (SIPRNET).

In addition to transparent TCP/IP access via radio, the software pack-

age PostMan DS100 which runs under Windows NT contains an intelligent E-mail system. This E-mail client is especially adapted to the requirements of a radio-based communication network. With this in mind, Rohde & Schwarz developed the new address format RSPeer that ensures the direct delivery of the message to the computer of the addressee. The message is physically available on the hard disk of the recipient, the usual detour to the central post office being avoided. This delivery procedure excludes any misuse of and unauthorized access to the mail traffic of a network which is usually stored on the post office server. Moreover this format ensures that one's own information is secure. This type of addressing also minimizes data exchange on the available frequencies and so eases the traffic load of the radio network.

The messages exchanged are furthermore protected by integrated encryption with an algorithm that is stored on a PCMCIA card. As the encryption interfaces were exclusively developed by Rohde & Schwarz, they can be disclosed. Access by third parties is excluded.

PostMan allows structures and network configurations to be defined as required. Traditional hierarchical official channels can be implemented using PostMan. For example, the horizontal distribution of E-mails, which is often regarded as a disadvantage in military applications, can optionally be suppressed.

In addition to HF/VHF/UHF radio, various other transmission media such as SatCom, ISDN or GSM may be used. PostMan optimizes the utilization of the available media by alternative routing. Should the medium intended for information transmis-
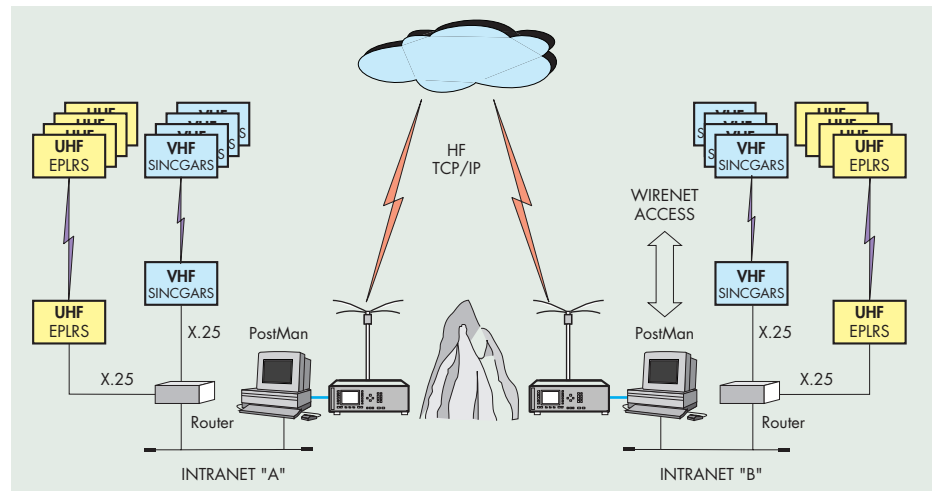
FIG 2   Tactical Internet access – CECOM trial: connecting VHF/UHF radiocommunication networks via HF

sion be interrupted, PostMan dynamically and automatically selects an alternative medium (according to a priority list) and continues transmission (FIG 3). Prior to selecting another medium PostMan checks whether the addressed station can be reached otherwise, eg via a relay station (alternative paths). The automatic change to alternative transmission media is a special feature of PostMan which no other E-mail system offers.

The E-mail client of PostMan possesses all the functions expected of a modern E-mail system. This includes

recording of all actions in a log book and assignment of different priorities to messages and addressees. Additional transmission acknowledge-ment and preselection of the time of sending the messages support the use of PostMan in radio networks.

The PostMan software package from Rohde & Schwarz gives radio networks access to the existing worldwide wire communication networks and their applications. The E-mail client moreover optimizes the utilization of electronic messages in military applications.
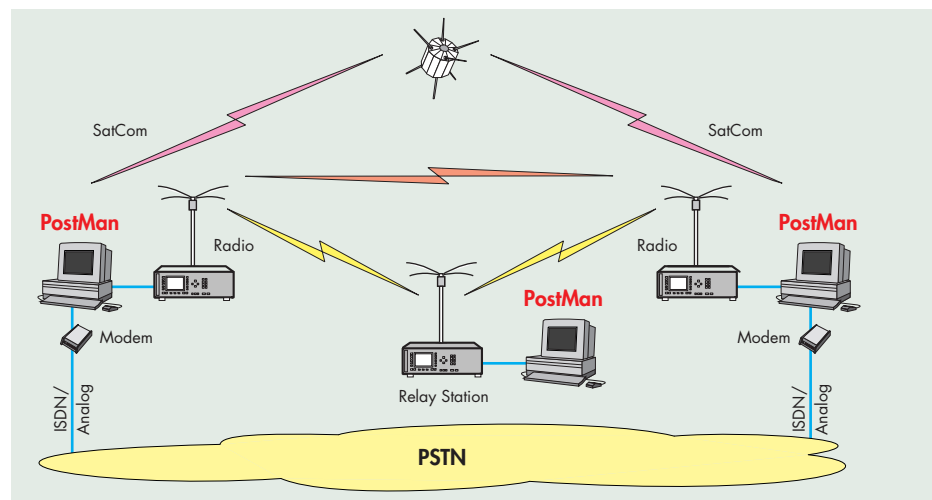
FIG 3   Alternative routing: automatic change of transmission paths and media