# Maritime Satellite Communications

Trafalgar House subsidiary, Radio & Electronic Services is helping to improve ship-to-shore communications using BLAST communications software from Docklands' software house, Output Software.

Events in the South Atlantic, Middle East and Panama have highlighted the need for merchant shipping to remain in constant communication with their owners and agents. However, non-military marine communications is now experiencing something of a technical revolution. The advent of satellite communication technology, used to transform ship to shore communications, has been available for some time, but merchant fleets around the world have tended to stay with more traditional equipment. As with other industries the majority of companies have looked towards the entrepreneurial minority to make practical use of this alternative communications methodology.

One such company, Trafalgar House's Radio and Electronic Services (R & ES), looked towards the development of a new global ship-to-shore solution. R & ES carry out research, development and consultancy in maritime communication and operations management and, as part of its on-going programme of developing an integrated ship- board management system, opted for the development of a ship-to-shore communications system using the established INMARSAT network of satellites positioned over the Indian, Pacific, and Atlantic oceans. One of the biggest problems in satellite communications is the need for both the shipboard and land-based stations to deal with the inevitable propagation delays resulting from the large distances involved. In designing a completely new system R & ES naturally looked towards a computer-based solution and, as part of their researches, investigated existing software packages available in the commercial market- place. The Company carried out extensive tests on a variety of software, and set up a test programme involving an around-the-world "hop" which incorporated all three INMARSAT satellites. R & ES originated calls in Liverpool with INMARSAT patching links from different ground-stations around the globe. Tests were conducted with messages travelling twice across the Atlantic, Pacific and Indian oceans. The propagation delay on three satellite hops is about one and a half seconds, and by
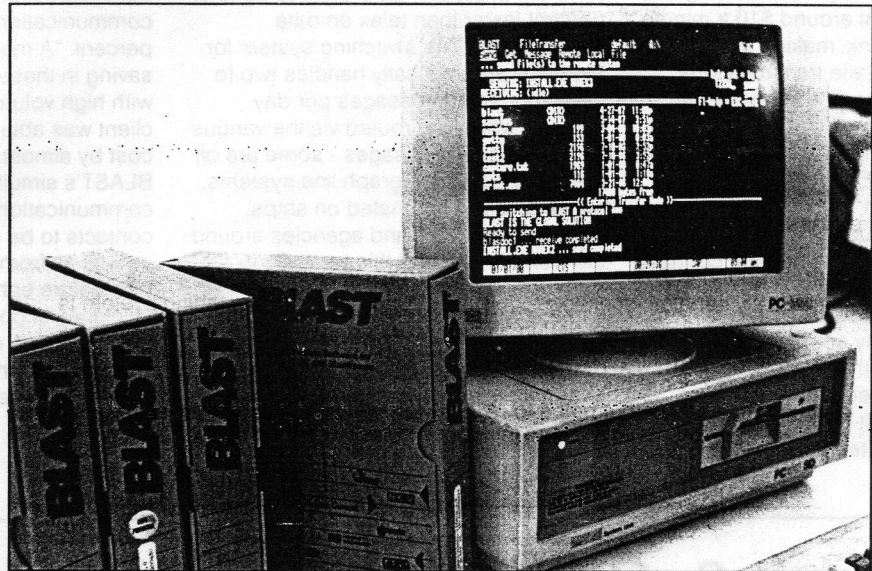
Blast asynchronous software, linking low-cost PCs to large mainframes over difficult transmission environments.

repeating the same exercise using different types of files, the alternative software packages were all rigourously tested and eliminated from the evaluation. After a three month testing period these were narrowed down to just one product, BLAST, an acronym for BLocked Asynchronous Transmission, and distributed in the United Kingdom by Output Software.

Already in operation with the US Defence Mapping Agency's Automated notice to Mariners' Service (ANMS), the BLAST software utilises the asynchronous interface channels provided by most computers. Any two computers (or nodes) running BLAST which, in practice, may be supplied by independent manufacturers using any one of thirty different operating systems, can transfer files reliably, efficiently and error free. The software is easy to understand and to use, and includes its own menu driven command interface and multi-level security schemes to protect data at each node during transmission, both important features to R & ES and users of their systems. Other important aspects found with the software were the facilities to automatically poll remote sites, and the inclusion of a full-duplex, sliding window

protocol, which allows variable size data blocks to be transmitted. Unlike other protocols, which can waste valuable connect time idling, BLAST sends data continually, selectively embedding and re-transmitting corrupted blocks, along with fresh data. This process is symmetrical, with both nodes able to send and receive error-free files simultaneously. Using these features R & ES tune BLAST to a particular circuit, important with ship-to-shore communications as these are often routed via satellites, or through packet-switch networks, or high-speed buffered modems.

Another company that conducted similar tests on international satellite communications via INMARSAT was International Marine Consultants (IMC). Established in 1985 as the commercial wing of the Marine Information Management Centre (MIMAC) - an off-shoot of Liverpool Polytechnic - their researches also concluded that the majority of communications packages took too long to correct transmission delays. However, the results of the work undertaken by R & ES with BLAST were confirmed by IMC technicians.

R & ES develop bespoke solutions for their clients, which vary from small

PC-based systems to fully automated message switching installations. However, the data dealt with in marine communications is enormously varied. Some organisations use the INMARSAT network for telephone or telex communications, the problem being that air-time is priced at around $10 a minute for each satellite link, making the cost of each call for mundane transmissions relatively expensive. R & ES has been able to reduce this air-time by utilising BLAST's data compression facility. According to R & ES' Sales Manager, Dennis Williamson, data compression reduces file sizes up to sixty and seventy percent, with equivalent savings connect costs. He added that as the software automatically handles incoming messages from any source, and in a variety of formats, the rejection rate of telex traffic has been reduced to less than one percent. It further helps to reduce operator intervention in this area.

Mobil Oil provide a practical example of the kind of project that R & ES undertakes for clients, and the advantages of their new system. The Company provided Mobil Oil with a replacement for an aging telex systems which, in practice, has proved to be forty percent faster than telex on data transmission. The switching system for Mobil Oil automatically handles two to three thousand messages per day, some of which are routed via the various telex networks messages - some are off Mobil Oil's own telegraph line systems, some calls are originated on ships, others from offices and agencies around the world. In spite of this variance in transmission types, as far the data coming into the switching system is concerned the rejection rate achieved is down to half a percent. Mobil Oil consider this a remarkable achievement for a message switching system which does not impose a fixed format to any of

the messages it processes.

With cost savings paramount in Government and commerce, the amount of money that can be saved by installing an R & ES system depends on the volume of traffic. Dennis Williamson advocates that their products can cut communications cost by around fifty percent. "A much greater percentage saving in these costs can be achieved with high volumes," he claimed, "One client was able to cut communications cost by almost a factor of ten. In addition, BLAST's simultaneous bi-directional communications enables automatic contacts to be initiated from shipboard as well as from land-based offices. While this feature enhances the speed and efficiency of communications it can further reduce costs as normal satellite communications initiated by BLAST do not require operator intervention." □

Output Software: European Blast User Partial Listing

Agriculture and Food Research Council
Anglia Television
Arco Great Britain
Arthur Guinness
AT&T International
Babcock Bristol
Bankers Trust Company
Banque National de Paris
Barclays Financial Services, Italy
H F Bulmer
British Broadcasting Company
BBC External Services
British Petroleum Development Ltd
British Petroleum International
British Press International
British Standards Institution
British Telecom International
BUPA Medical Centre
Central Electricity Generating Board
CERN
The China Navigation Co
Citibank
Citicorp Investment Bank
Computervision France
Conoco (UK) Ltd
Coral Racing
County Group

Cunard Steam-Ship Co
Data General Corporation
FEL-TNO Defence Research Laboratory, The Hague
GEC Avionics
GEC Telecommunications
Grundig GmbH
Hewlett Packard
Hoskyns Group
Hugin Sweda
IBM Switzerland
Institute of Electrical Engineers
International Maritime Satellite Organisation
Institute of Medical Research
Istel
J P Morgan Investment Management Inc
John Brown Engineering
Logica
Lotus Development
Lunn Poly
McDonnell Douglas Information Systems
Marconi Instruments
Marconi Quest CAE
Mobil Oil
MOD — Admiralty Research Establishment

Morganite Crucible Ltd
Morgan Guaranty Trust Company
National Westminster Bank
Nixdorf Computer AG
P & O Bulk Shipping
Rank Xerox
RCA Records
Reed International
Reed Paper and Board
Research Machines
Royal Signals & Radar Establishment
Ryman Ltd
Shell International
Siemens AG
Systime Computers Ltd
Tarmac Roadstone Holdings
Televideo
Tetra Business Systems
Thomson Regional Newspapers
Union Bank of Switzerland
Union Carbide
Unisys
Wang Laboratories
Watney Mann Group
Westminster Press

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