Hackers eye defence satellite

Skynet 4E improves military communication

By Richard Gardner

ON STATION in geostationary orbit above the equator since the end of March, Skynet 4E, the second in a series of three Skynet four, Stage two spacecraft built by Matra Marconi Space for the United Kingdom Ministry of Defence (MoD), is providing an enhanced strategic and tactical communications capability for the UK's widely dispersed maritime, air and land forces.

Skynet 4E, weighing 1,490 kilograms was successfully launched on Ariane 44L Flight V116 from Kourou in French Guiana on 26 February 1999, the satellite separating from the launcher as scheduled 25 minutes after lift-off.

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Recent press reports have claimed that computer hackers had electronically hi-jacked an MoD-operated skynet and demanded payment for 'returning' control of the satellite. This has been firmly denied by the MoD which has stated that there has been no unusual or unexplained interruption to services provided by its satellites, with no loss of control or spurious communications or movements.

It pointed out that monitoring of the performance and control of satellites is taken very seriously and is done on a continuous basis. Had any control link been intercepted, any hacker would have discovered that the links were protected by multiple layers of the highest forms of encryption technology.

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testing began prior to the satellite's official handover. Matra Marconi Space's 'delivery-in-orbit' contract with the MoD includes the manufacture of the satellite, its launch and also the operational control and in-orbit testing prior to handover to the customer. Skynet 4 is expected to remain in service well into the next decade. Secure military communications using space assets are essential to UK defence policy and the MoD has stated that it will maintain its access to a satellite capability under any public-private partnership developments in the future.

The current Skynet 4 Stage 2 programme package is worth 400 million pounds sterling and MoD investment in space communications will continue with the aim of providing a cost-effective solution for Skynet 5.

The latest Skynet 4 satellites are designed to reflect changes in operational requirements resulting from evolving defence commitments in a volatile and unstable world. They also incorporate technological developments that now offer significantly better performance than was available aboard the Stage 1 series (of which three were launched for the MoD in 1988-90, plus two, in 1991 and '93, for Nato, the North Atlantic Treaty Organisation).

The major features of the Stage 2 series include: frequency diversity (using both UHF and SHF (super high frequency) channels); operational flexibility (selectable power, channels and antennas and power with steerable spot beams allowing a range of ground stations to be supported simultaneously); high reliability (incorporating maximum use of redundancy and slow predictable degradation in system performance); cost effectiveness (with an operational life of at least seven years and requiring minimum skilled staffing levels for system operation) and survivability (hardened against electromagnetic

Other security measures are in place to prevent any mischievous activity along the lines reported. Skynet 4 remains one of the most secure communications satellites eve launched into orbit.

Skynet 4D was launched from Cape Canaveral, United States, in January 1998 and the final spacecraft in the series, Skynet 4F, is being manufactured in the UK at Stevenage and Portsmouth (southern England) by Matra Marconi Space (MMS). It, too, like skynet 4E will be launched on a European Ariane 4 rocket from French Guiana, probably early in 2000.
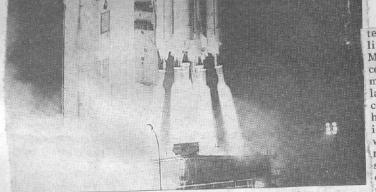
Matra Marconi Space is a world leader in military space activities and has manufactured all the military satellites for either communications or surveillance developed so far in Europe. For the future, Paradigm Secure Communications has been established by MMS and its partners to provide secure satellite communications services for military and other government users.

The new approach will fuse the best of the emerging commercial technologies, such as low earth orbit constellations, for global voice and broadband communications, with the latest military satellite communications technology.

This will deliver a secure global communications infrastructure to support the digital battlespace at an affordable cost. Providing communications links on demand, with substantially increased capacity and least-expensive call routing will offer important operational benefits to the armed forces and also provide secure communications facilities for other government departments and agencies.

I will also provide for the 21st century a new, highly flexible infrastructure that can evolve continuously to keep pace with technical developments and ever increasing demands for a growing range of communications services. ■—LPS Service

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On 1 March, at the 7th apogee (the point in an elliptical orbit farthest from earth), the satellite's kick motor was fired and the spacecraft was boosted into geostationary drift orbit. On 2 March the solar arrays were deployed to lock on to the sun and earth acquisition was achieved.

Subsequently the Ultra High Frequency (UHF) antenna was successfully deployed and in-orbit testing began prior to the satellite's official handover. Matra Marconi Space's 'delivery-in-orbit' contract with the MoD includes the manufacture of the satellite, its launch and also the operational control and in-orbit testing prior to handover to the customer. Skynet 4 is expected to remain in service well into the next decade. Secure military communications using space assets are essential to UK defence policy and the MoD has stated that it will maintain its access to a satellite capability under any public-private partnership developments in the future.

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This alone would have prevented them from reading or introducing any unauthorised command information. Any such interruption would have been immediately detected by the computer control system and yet more alarms would have been raised had a hacker tried to maintain synchronisation between the satellite's configuration and the ground station computer and databases.

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