

# LINKING THE UK ARMED FORCES CHAIN OF COMMAND

## FALCON OVERVIEW

INTEGRATED BATTLE COMMAND

INTELLIGENCE & CYBER SECURITY

GLOBAL COMBAT NETWORKS

AIR DEFENCE

BORDER, FACILITIES & FORCE PROTECTION

BUSINESS SOLUTIONS

BUSINESS SERVICES



**BAE SYSTEMS**

REAL INFORMATION. REAL ADVANTAGE.



**FALCON IS THE FINAL ELEMENT TO THE UK ARMED FORCES' DEPLOYED NETWORKS CAPABILITY AND WILL BE THE KEY COMPONENT FOR DELIVERING ROBUST, HIGH CAPACITY INFORMATION SERVICES IN THE BATTLEFIELD**

The increase in the use of Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) assets delivering huge quantities of video imagery and information demands systems which are capable of handling large amounts of data. Meeting these exacting requirements, FALCON is fundamental to the UK Armed Forces in providing robust, high capacity network services across the battlefield.

FALCON is the UK Armed Forces' new generation tactical communications system. Harnessing the extensive skills, knowledge and collective expertise of our team, FALCON is an all-IP (Internet Protocol) solution delivering the final building block to upgrade the Deployed Networks Capability of the British Armed Forces.

Data and voice traffic is passed over the network, in a manner similar to a telephone system. Traffic is conveyed by a combination of routers and switches which decide where the information should be sent next and links which pass the actual information.

Exploiting the principles of IP, traffic is split into small packets, which then each find their own path through the network to their destination. This makes the flow of traffic resilient to destruction of parts of the network from hostile electronic and physical attack. The packets are reassembled into their original form at the receiving end.

Providing secure, high capacity voice, data and video communications, staff at command headquarters (HQ) can operate at up to 4 separate security domains over the common wide area network.

Each working area within the HQ can operate at its own security level, depending on the nationality and security clearance of the staff that have access to a particular area.

Information is securely exchanged from UNCLASSIFIED up to SECRET and between domains.

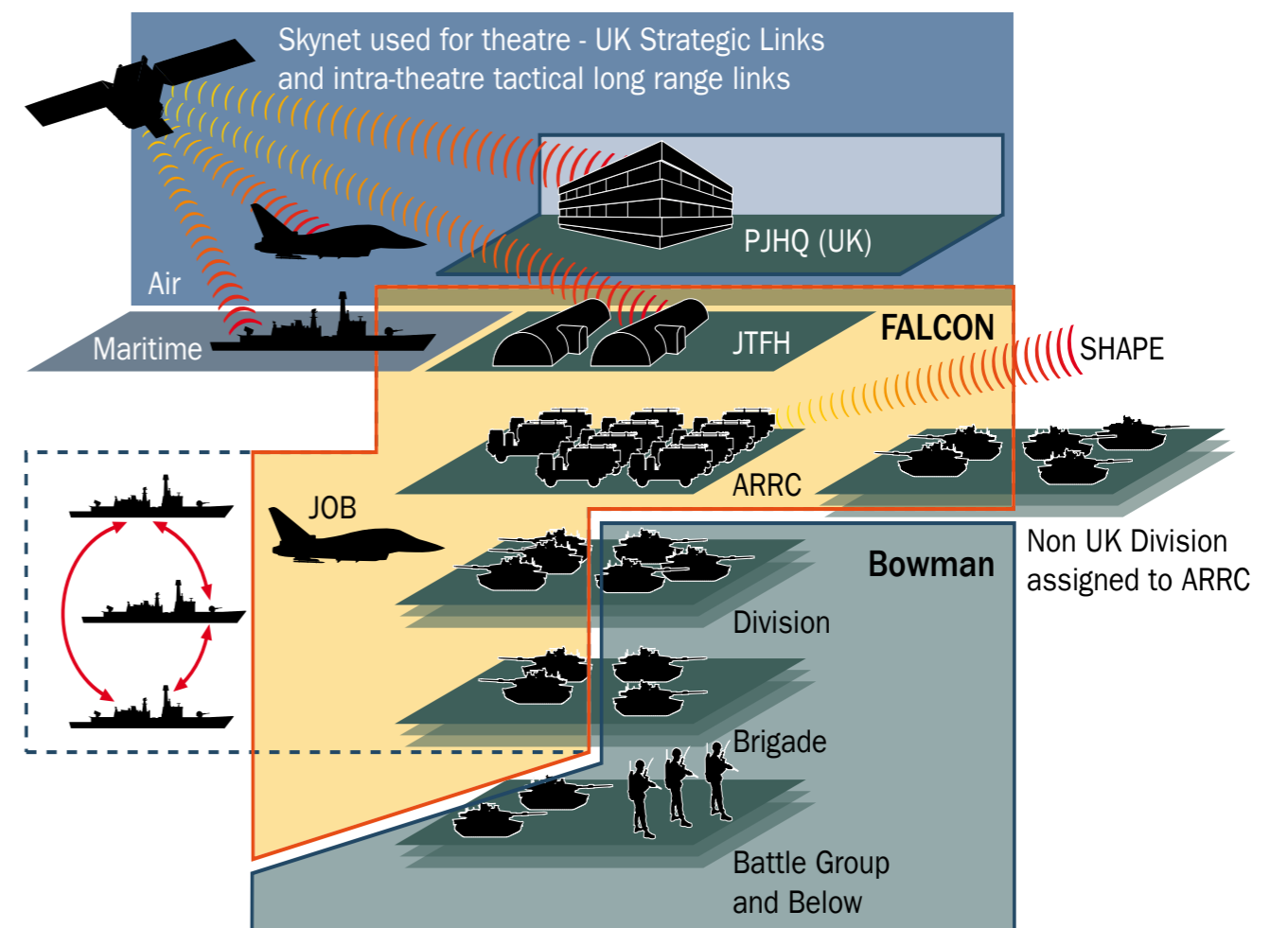
Vastly improving the capability and scaling of the equipment it is replacing, FALCON will interoperate with a large number of military and commercial communications systems. Interaction with Bowman will enable information to be shared around the battlefield. For long range communications and reachback FALCON will interoperate with SKYNET5

satellite services, using it to transfer information either from theatre back to the UK, or potentially between different parts of the network in theatre. Other networks that will transfer information with FALCON include Cormorant, DII(FD), NATO core and NATO tactical networks.

FALCON is a combination of best of breed communication technologies, packaged into rugged and environmentally protected containers. Rapidly configurable, FALCON supports differing RAF and Army missions and operational tempo.

Delivering a robust, scalable and flexible solution, FALCON meets the high security, high volume communication needs of modern expeditionary Armed Forces.

- Improved mission effectiveness with multiple levels of security, from RESTRICTED through to SECRET, for intra and inter-domain communication
- Increased force interoperability through the use of open standards and a full range of gateways and IP components
- Improved force effectiveness through effective exploitation of a single system
- Reduced set-up times allow faster connectivity to share situational awareness and command and control information.
- Increased modularity, transportable by Air or as an under-slung load
- Improved resilience to counter hostile electronic and physical attack



# FALCON'S TRUNK COMMUNICATIONS SYSTEM

Delivered incrementally, **Increment A** equips HQs and supporting units with the ARRC (Allied Rapid Reaction Corps). **Increment C** delivers an information infrastructure for deployed RAF bases.

Providing a number of WASP (Wide Area Service Provision) and CPS (Command Post Support) nodes that are connected to form a resilient network, FALCON securely links the UK Armed Forces chain of command.

## The Wide Area System (WAS)

Using standard IP, each of the WAS nodes communicates with any of the other nodes in the network by passing information to one of its adjacent nodes, where the data will be relayed onto another node until the message reaches its destination. Each message makes a series of hops across the network until it reaches its final destination.

When each message is generated, FALCON automatically decides the route along which the message should be sent. It also reacts dynamically to the loss of links and nodes that result from: enemy EW (Electronic Warfare), destruction of FALCON assets, and the disruption caused when FALCON assets have to re-deploy in order to support manoeuvring troops. This planning and dynamic re-planning makes FALCON very resilient; each message is able to use a number of alternative routes making best use of all available nodes and links.

Each FALCON WASP vehicle includes a container within which the FALCON equipment is operated. The installation contains generators, an environmental conditioning unit, masts and antennae, together with space for a 3-person crew with rations, water and fuel.

The containers are predominantly vehicle mounted, using the MAN HX60 prime mover. This vehicle is a transportable, medium mobility, off-road vehicle which is the standard military vehicle in this class. Palletised equipment allows for deployment in locations where the use of the MAN HX60, or the container, is not appropriate, such as in a building of opportunity.

The WASP provides several links to other WASPs, CPS installations or other networks. FALCON provides its own radio links, but other systems such as SKYNET 5 satellite services, rented commercial links or other tactical systems are exploited.

## The Local Area System

The CPS installations provide local area systems for both voice traffic and data and also provide switching capability to link into the WAS.

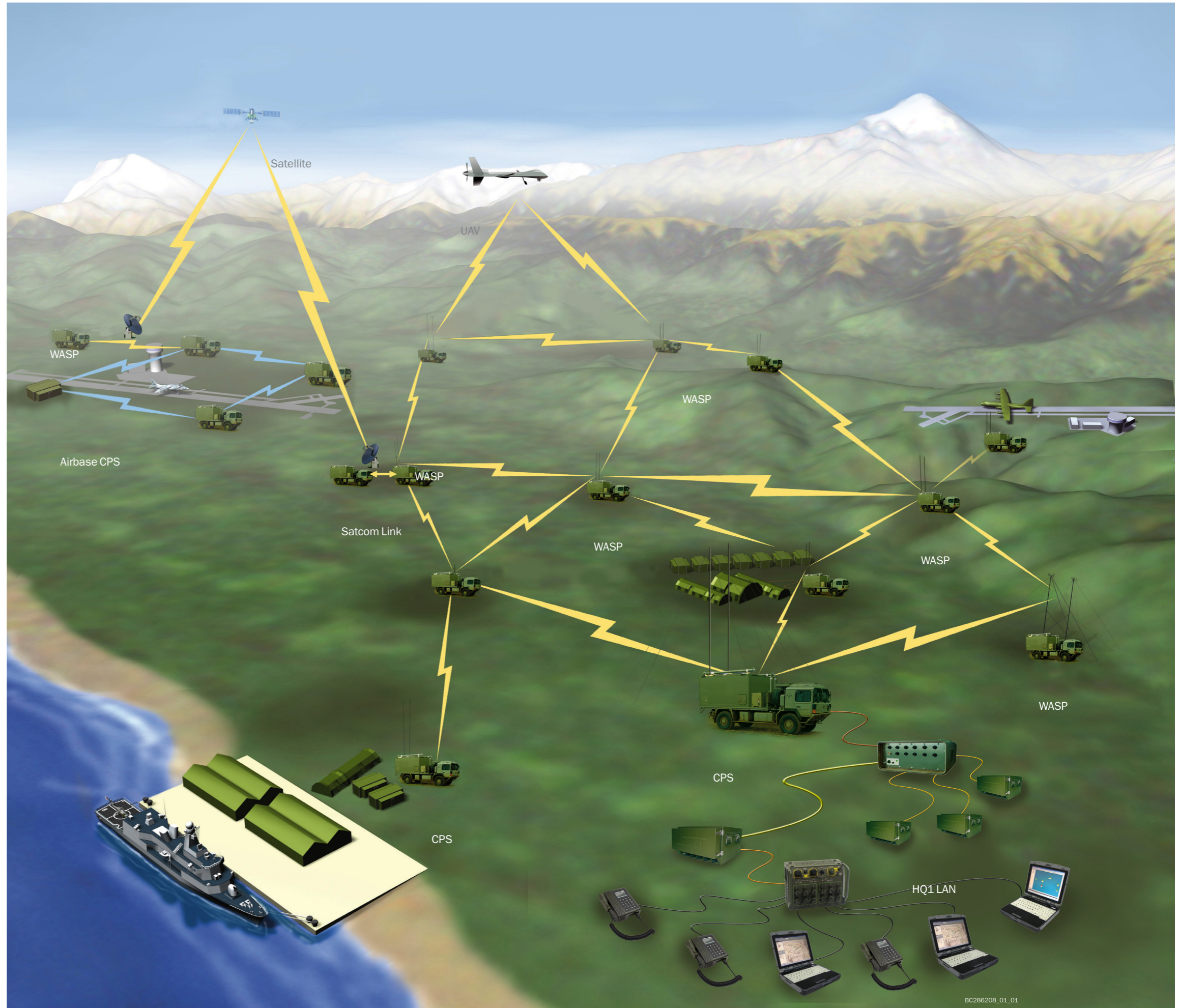
The local area system can be managed within the Command Post by a deployed Management Terminal or across the Wide Area Network from a Management Installation.

## FALCON Management

Management and monitoring of the FALCON network is performed in a number of different locations. Access and control will depend upon a network manager's level of permissions and authority.

Mounted within a container on the back of a vehicle or palletised, the FALCON Management Installation (FMI) allows for management of the FALCON network from within the installation or remotely.

The FALCON Management System (FMS), housed within the FMI, provides all the tools necessary to support the active and dynamic management of the network. Delivering a comprehensive range of capabilities to plan, establish, monitor, manage, control and support the network, the FMS efficiently supports network managers to ensure continued network operational effectiveness.



## FALCON DELIVERS A HIGH CAPACITY AND ROBUST COMMUNICATIONS CAPABILITY



## DEPLOYMENT

FALCON is a vastly improved capability, delivering increased scaling over the existing British Army and RAF systems, including Cormorant, it is replacing. Cormorant and FALCON are substantially different.

Cormorant was bought as a rapidly deployable communications system for use at the Joint Task Force Headquarters (JTFHQ). It is based on off-the-shelf equipment using Asynchronous Transfer Mode (ATM) technology. Although tactically deployable has been designed primarily for a relatively safe environment (both electronically and environmentally).

Cormorant will eventually be de-commissioned when FALCON enters service. FALCON will initially be deployed in two Increments:

**Increment A** is a soft skinned and palletised, air transportable variant providing the information infrastructure to meet the needs of deployed Land Forces. It replaces the capability previously provided by Ptarmigan and delivers communications across the battlespace between the Bowman Combat Net Radio system and the Skynet SATCOM system. FALCON is the essential glue that joins together other UK MoD communications assets such as Skynet 5 and Bowman. FALCON's broadband capability underpins the UK MoD's deployment of ISTAR assets.

**Increment C** is the communications infrastructure for the RAF's Joint and Deployed Operating Bases (JOB/DOBs). It replaces the RAF Transportable Telecommunications System (RTTS) and the Deployed Local Area Network (DLAN) in their entirety.

## EXAMPLE COMPONENTS

- Prime Mover MAN HX60  
The same multi-role vehicle for all FALCON variants
- CPS (Command Post Support)  
The CPS connects local area subscribers (voice, data and video) to all CP (Command Posts) and to the WAS (Wide Area System)
- WASP (Wide Area Service Provision)  
The wide area system that links together all Command Post and remote users
- Management and Support  
Management Installations provide planning, configuration, monitoring and network control facilities. Other Installations provide support, maintenance and repair amenities.
- Equipment, such as routers, will be installed in packing cases which are mounted in the Shelter on the Prime Mover
- SGAU (Subscriber Group Access Unit)  
Contains Selex Elsag Sentinel telephone software for the IP Gatekeeper/Telephone Server function
- Ruggedised IP telephones
- Radios  
The Ultra Band I/III and Thales Band IV radios allow line of sight connectivity (fitted in WASP /CPS).The Ultra Band I/III typically operating at 8Mbps and the Thales Band IV is capable of 34Mbps.
- Two levels of encryption are provided by the Thales DC3T Crypto's-Packet and Bulk (link protection)
- Whilst not part of the FALCON contract, additional transmission media, such as SATCOMS and Tropo can be used when available in theatre

FALCON's efficient radios and antennas, sophisticated intelligent management systems and network design maximise the rate at which information can be exchanged. Together these combine to ensure that FALCON will continue to deliver a high capacity yet robust communications capability meeting the needs of today's and tomorrow's Armed Forces.



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