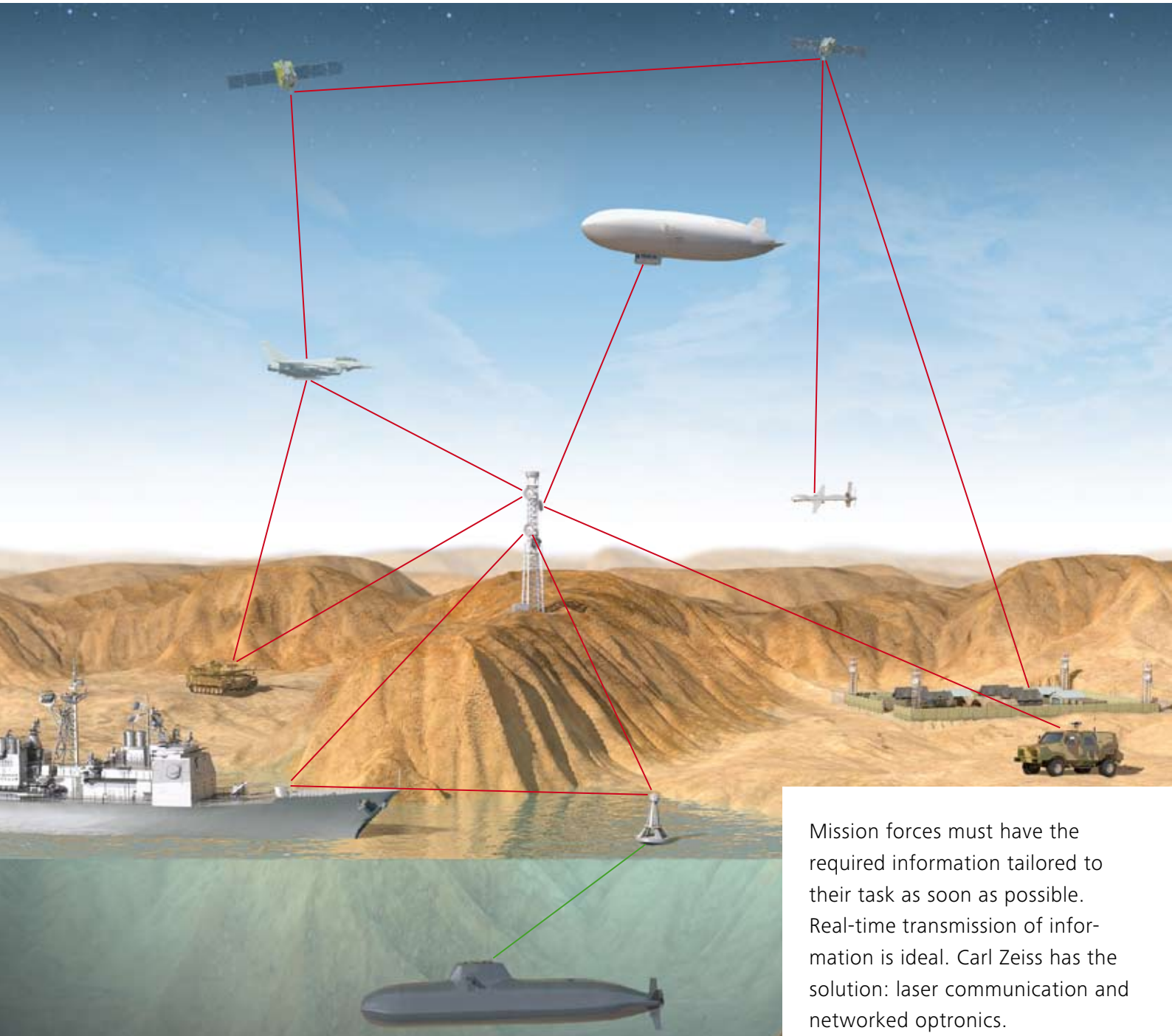


Contribution to Network Centric Warfare



Mission forces must have the required information tailored to their task as soon as possible. Real-time transmission of information is ideal. Carl Zeiss has the solution: laser communication and networked optronics.



We make it visible.

Real-time transmission

As a core element of Network Centric Warfare, laser communication permits the transmission of all types of data and its analysis, thus expanding the leadership capabilities of the military. The ISR-Net sensor network is a concept created by Carl Zeiss Optronics with Thales Germany and DIEHL BGT Defence. It allows mobile reconnaissance units to provide real-time daylight and infrared images, coupled with radar tracks, of the situation during the day and at night. Information is also transmitted in real time using a dynamic, digital ad hoc radio network.

The decisive advantage of both processes: leaders and mission forces receive current, high-quality observation information and geo-referenced target coordinates at any time, enabling them to make decisions on tactical measures as quickly as possible.

Laser communication makes

Network Centric Warfare highly effective

On the basis of ethernet, laser communication allows transmission of digital data in real time, also encrypted in accordance with IPv4 and IPv6. Aerial photos, images from covert reconnaissance, radar and sensor data can be transmitted over long distances to control centres and between mobile units without the risk of interference or interception. The high network capacity offers transmission rates in the



Stabilized laser communication from Carl Zeiss: tests on laser communications up to 24 km between the German multipurpose naval boat Breitgrund and a land station were successful.



The MEOS II stabilized platform for 360° reconnaissance, object observation and the determination of target coordinates has been specially developed for surface ships.

Gbit range. It is also required to transmit and use uncompressed sensor information without a loss of data or time. This is necessary, for example, for the real-time evaluation of long-endurance missions with drones and UAVs.

Laser communication successfully tested

In June 2008, Carl Zeiss implemented a 24 km broadband laser communication link with the German navy for the first time. The laser communication terminals (LCT) were integrated into stabilized sensor platforms that automatically align themselves in order to ensure the ship-to-land link on a moving ship. The video streams and video conferences were transmitted at the ethernet standard of 100 Mbit/s. In the future, Gbit/s will be possible with applications in the atmosphere. With an LCT that flew on the TerraSAR-X satellite (launched in June 2007), data transmission rates of 5.5 Gbit/s have already been achieved in space using technology from Carl Zeiss.

Networked optronics enables real-time reconnaissance and security

Networked optronics in a dynamic, self-organizing radio network provide leaders and mission forces with the required real-time daylight and night-vision information, as well as target coordinates. The latest digital communication technology enables the system to independently search for the optimum, free radio link for image transmission. The command group always receives current information, enabling them to generate a common, relevant operational picture (CROP). Carl Zeiss has laid the technological foundation for this through long-distance, high-resolution sensors – laser rangefinders, CCD colour and B/W cameras, and thermal imagers. For surface ships, Carl Zeiss integrates the sensors into stabilized platforms that independently compensate for motion at sea. These platforms are used for both 360° reconnaissance and targeted object observation, as well as for the determination of target coordinates and their transmission to the fire control system of a ship.

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