

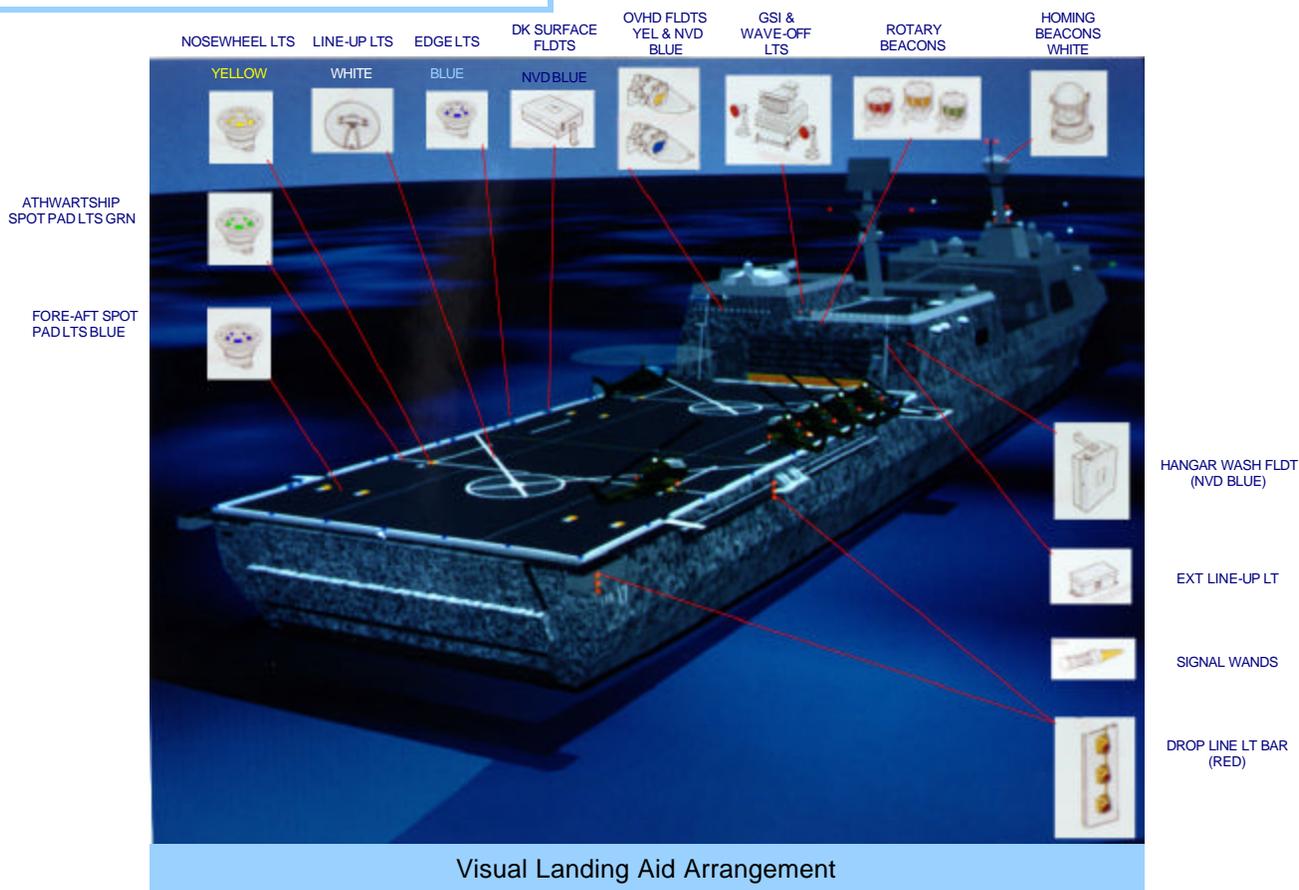
# Visual Landing Aids

## Advantages and Features

Pilots approaching small ships at night in heavy weather are critically reliant on visual cues through approach, hover, and landing. In addition, ship personnel must have enough illumination to perform their functions safely on a moving deck in poor weather conditions without interfering with the pilot's visual cues. The U.S. Navy has developed an array of visual landing aids for small, air capable ships and amphibious assault ships to continually improve the safe landings of helicopters and vertical short takeoff and landing (VSTOL) aircraft.

## Technology Description

NAVAIR Lakehurst's Aircraft Platform Interface responsibility extends beyond the aircraft carrier to all of the Navy's amphibious assault and air capable ships. NAVAIR Lakehurst certifies that the aviation facilities for these ships are able to support landing, takeoff, servicing, and maintenance operations for helicopters operating from destroyers and frigates and VSTOL aircraft operating from amphibious assault ships. We are responsible for the lighting and marking systems that facilitate safe helicopter and aircraft operations at night and in bad weather. NAVAIR Lakehurst designed a flight deck lighting package compatible with night vision goggles for low light level operations. Other visual landing aid



systems developed by NAVAIR Lakehurst are described below:

#### Stabilized Glide Slope Indicator (SGSI)

An electro-hydraulic optical landing aid uses a single bar of green, amber, or red light to communicate with the pilot of the approaching aircraft. A green light indicates that the pilot is above the correct glide path; red indicates that the pilot is below it; and amber that the pilot is on the correct path. By adjusting the altitude to keep the amber light bar visible, the pilot maintains the correct glide path to the ship's landing pad. The bar of light is a virtual image formed by magnifying an illuminated slot and then spreading the image horizontally with a lenticular lens. This bar of light appears to move vertically within the cell face as the observer moves vertically. Its color changes as the bar moves behind the color filters located behind the lenticular lens. The SGSI is not night vision compatible.

#### VSTOL Optical Landing System (OLS)

Used on amphibious assault ships, this Lakehurst-designed visual landing aid displays glide path and trend information to the VSTOL pilot preparing to land on ship. The system has a display that is visible up to 0.8 nautical miles and at a ceiling of 200 feet. The OLS guides the aircraft to 50 feet above the flight deck up to the final approach phase.

#### Helicopter Operations Surveillance System (HOSS)

This system provides the bridge with a real-time, closed-circuit television visual display of helicopter operations. The HOSS monitors and records landing, takeoff, in-flight refueling,

vertical replenishment, and other operations for safety purposes and tactical maneuvering of the ship. The video cassette recorder allows for immediate playback for evaluating in debriefing and accident analysis.

### Licensing and Partnering Opportunities

Domestic technology transfer and partnership activities are integral elements of the Department of Defense's national security mission and concurrently improve the economic, environmental, and social well being of U.S. citizens. At the same time, technology transfer supports a strong industrial base that the Department of Defense may use to supply U.S. defense needs.

Several mechanisms exist for partnering with NAVAIR Lakehurst. These include cooperative research and development agreements (CRADAs), commercial service agreements (CSAs), and licensing of government-owned technologies. Under a CRADA, Lakehurst engineers and scientists work cooperatively with their peers in industry or academia on mutually beneficial research and development. The Navy has been given statutory authorization, via CSAs, to use Navy facilities to perform specific types of work for private parties. NAVAIR Lakehurst frequently produces patented, innovative discoveries of commercial value that are available for licensing to the private sector. Information about partnering with NAVAIR Lakehurst is available from the Business Development Office.

#### For more information contact

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The Naval Air Warfare Center Aircraft Division Lakehurst, known as NAVAIR Lakehurst, is part of the Naval Aviation Systems TEAM. NAVAIR Lakehurst researches, develops, tests, and procures aircraft launch and recovery systems and support equipment for Navy and Marine aviation.

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