# CCNS

COMPUTER CONTROLLED NAVIGATION SYSTEM

Image showing (from left to right): Central Computer Unit (CCU), the high-end GPS antenna and the Command & Display Unit (5 inch TFT) for the pilot.

CCNS4 - 4th generation

The *CCNS4* system is a guidance, positioning and sensor management system for aerial survey missions. The basic system consists of a Central Computer Unit (CCU), one Command and Display Unit (5 inch TFT), a state-of-the-art GPS receiver with antenna, necessary cabling and a shock-absorbing mounting plate.

The system is universally usable and can operate and integrate all common digital and analog aerial camera systems. Together with *IGIplan* it provides a complete and comprehensive solution for mission planning, aircraft guidance and sensor management.

The *CCNS4* controls the camera and other sensors, including crab / drift setting(s), V / H computation and provides data for data annotation on film; the coordinates may be WGS 84 or the countries X / Y - coordinates (optional).

Fully Automated Flight Control System

The *CCNS4* has the benefit of a fully automated flight control system for aerial surveying and reconnaissance. A pilot`s Control & Display Unit (primary) and a pilot`s or operator`s Control & Display Unit (secondary) - both 5 inch TFT - are available. All operations are activated easily via one control dial and five buttons. The EFIS type display, which is operated like an aircraft instrument, is divided into guidance and system / sensor management information (right side of the TFT). The pilot merely has to "follow the line". Outputs with selectable sensitivity for HSI and CDI instruments.

The Display - Built like a Cockpit Instrument
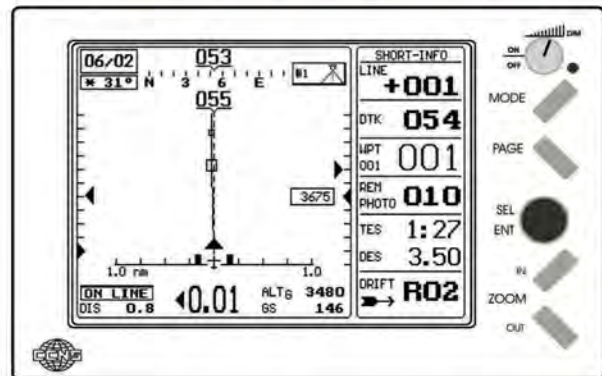
The example above is an illustration of data taken from an actual photo mission. It shows from top to bottom the following guidance information:

Current Heading:	053 deg
Current (true) Track:	055 deg
Drift (bottom):	R02 deg
Camera Symbol:	CAM#1 to be fired
Planned Altitude:	3675 feet
Actual Altitude:	3480 feet
Ground Speed:	146 knots
Off-Track Dist. (XTD):	0.01 nm
Off-Track Correction:	to the left
ON LINE:	aircraft is on line, i.e. The camera(s) is activated
Dist. to next WPT:	0.8 nm

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CCNS4™ - Computer Controlled Navigation System

The *CCNS4* requires position and velocity information from a GPS receiver and optional directional information from the aircraft`s directional gyro (DG).

The *CCNS4* can be operated by a variety of external GPS receivers that already may be installed in the aircraft by using the receiver specific data format or the NMEA 0183 data format.

The integrated GPS receiver is prepared for differential GPS (DGPS) operations according to RTCM-104 format and can receive realtime differential corrections from WAAS and EGNOS satellites. Directional gyro information is used by a Kalman filter process for stable position information and drift / crab calculation. Corrections for local variations and aircraft deviations can be used.

Perfect Combination
CCNS4 and AEROcontrol

With IGI`s *AEROcontrol,* the real time or post-processing determination of precise sensor positions and attitude/orientation data is available.
All operations and the management of the *AEROcontrol* system is controlled by the *CCNS4*.

All raw data of the IMU (128 Hz and 256 Hz available) are stored on the *AEROcontrol* Data Card for post-processing.

AEROoffice is IGI`s data handling and post-processing software for the *AEROcontrol* system. The software uses a forward/backward Kalman filter algorithm to achieve optimal results.

Over 300 Systems in Operations - Worldwide

The *CCNS4* is able to control up to two cameras. The actual flight data, including the aircraft`s position in WGS 84 coordinates or a local grid system (optional) are computed and can be provided for data annotation on film.
Waypoint / photo data, flight information and GPS positions are stored and transferred to the *CCNS4* Mission Card for post flight processing, analysis and plotting of the flight index or the complete mission.
The system has the advantage of no mechanical (moving) parts, no hard or floppy disk to crash or wear out from dust, humidity, acceleration or vibration.
More than 300 installations - worldwide - show that the *CCNS4* is a very reliable system. Using the *CCNS4,* no specialized photo pilot or photo navigator is required.

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