

Leica Systems Overview

RC30 AERIAL CAMERA SYSTEM



The Leica RC30 aerial film camera is the culmination of decades of development, started with Wild's first aerial camera in the 1920s. Beautifully engineered yet extremely robust, the RC30 is enhanced with the PAV30 gyro-stabilized mount and other sub-systems such as the NSF3 navigation sight. The camera can also be supplemented by airborne GPS and IMU systems.

For decades, the Leica RC series of Aerial Camera Systems has been the number one choice for customers all over the world. These cameras are renowned for their quality and long-term reliability.

The latest model, the RC30, offers two interchangeable lenses, negligible distortion and reach lens/film resolutions well over 100 lp/mm. Apertures up to f/4 and shutter speeds from 1/100 to 1/1000 second maximize applicability. Forward motion compensation produces crystal clear photos at low light levels and altitudes. Additional film cassettes are inexpensive, so prolonged missions are feasible. Other big advantages include the PEM-F automatic exposure control and the flexible data annotation on each photograph. Navigation sights, viewfinders and a wide range of filters complete this solution.

The RC30 can be combined with the PAV30 Gyro-stabilized Camera Mount and the Aerial Survey Control Tool (ASCOT) for a complete aerial survey system.

Features:

- High quality lenses offer the highest resolution
- Outstanding long-term stability
- Forward motion compensation (FMC)
- Gyro-stabilized mount available (PAV30)
- Automatic exposure meter
- Communication with ASCOT and other systems
- Data annotation on each photograph
- Modular design, micro-processor controlled

RC 30 System - Technical Data:

RC30 System weight approx 145 kg

Including:

- NSF3 Viewfinder and Navigation Sight;
- PAV30 Gyro-Stabilized Camera Mount;
- ASCOT (Aerial Survey Control Tool)
- Lens cone with 1 Filter
- Film Cassette
- Film (150 m) on Spool
- Cable

RC30 System Power consumption at 28 VDC approx 30 Amp.

PAV30 Gyro-Stabilized Camera Mount



The Leica PAV30 Gyro-Stabilized Camera Mount helps to improve the quality of your aerial photography missions. It compensates for angular aircraft movements due to turbulence, including pitch, roll and drift. As a result, survey flights are more efficient and result in sharper images, as well as reduced stress on the flight crew.

The PAV30 is designed to carry a variety of camera payloads, including the Leica RC30 Aerial Camera System. The PAV30 can also be connected to your aircraft's navigational system using ASCOT (Aerial Survey Control Tool).

Features:

- Contributes to superior image quality
- Auto-adjusting vertical orientation
- Reduces stress on the flight crew
- Results in more efficient survey flights
- Extends flying hours
- Connects to aircraft navigation systems
- Interchanges directly with existing mounts
- Standard output interface for recording attitude angles

PAV 30 - Technical Data:

PAV30 Weight approx 27 kg

PAV30 Power consumption at 28 VDC approximate 6 Amp.

ASCOT (Aerial Survey Control Tool)



ASCOT Aerial Survey Control Tool is a GPS-based flight management system for aerial survey flights. ASCOT includes flight planning, navigation and camera control during flight, GPS raw data recording and post-mission evaluation.

Once you finalize the flight plan, transfer it to the on-board control computer and link it to the airborne GPS, the ASCOT LCD displays instructions on flying the aircraft during approaches, turns and along the planned flight lines. ASCOT also controls both the gyro-stabilized mount and the camera, including the photo annotation. Outputs include flight reporting and GPS data ready for post-processing or use in triangulation systems.

ASCOT is designed to work with a variety of aerial survey systems, including the RC30 Aerial Film Camera and the PAV30 Gyro-Stabilizer Mount.

Features:

- Computer-aided set up of flight lines, photo centers and frame annotation
- GPS-supported navigation, recording of raw GPS phase measurements and data annotation
- Computer-aided documentation and analysis of photo flights
- Tools such as RINEX conversion, stationary GPS recording, sun elevation angle display
- Dual camera systems and other multi-sensor configurations

ASCOT - Technical Data:

ASCOT Weight approx 27 kg

ASCOT Power consumption at 28 VDC approximate 6 Amp.

ADS40 Airborne Digital Sensor



The Leica ADS40 Airborne Digital Sensor lets customers complete, for the first time, an all digital flow line, with no chemical film processing or scanning, yet with the swath width and area coverage of a film camera. Moreover, the sensor produces 12-bit data with three panchromatic views, three color bands and one near-infrared band, exploiting the exciting three-line-scanner concept and a number of technological innovations

The high performance Leica ADS40 Airborne Digital Sensor, the first of its kind, delivers all digital, 12-bit data with the swath width and coverage area of a traditional film camera now **with 5-centimeter spatial resolution**. The improved spatial resolution results of the ADS40 enable users to:

- Achieve higher accuracy in large-scale mapping applications
- Extract more detailed information
- Digitally equal black & white film resolution

The sensor's innovative construction allows for the simultaneous acquisition of seven bands of information: three panchromatic CCD lines capture information in views forward, nadir and backward from the aircraft, while four multispectral lines capture data in the near-infrared band.

The advantages of an all-digital workflow, with no chemical film processing or scanning, are tremendous. With the ADS40, you can work digitally from flight planning through image acquisition, then return from the flight mission with digital data ready to enter the ground processing and archiving stages of today's workflow.

Features:

- 5-centimeter spatial resolution in black & white stereo imagery
- Three sensors in one - black and white, color and false color
- Wide area coverage for big cost savings
- Perfect RGB co-registration through special trichroid filter
- High quality DTMs from three-line stereo sensor data
- Reduced ground control requirements
- End-to-end digital flow - no film processing or scanning

ADS 40 System - Technical Data:

ADS 40 System weight approx 220 kg

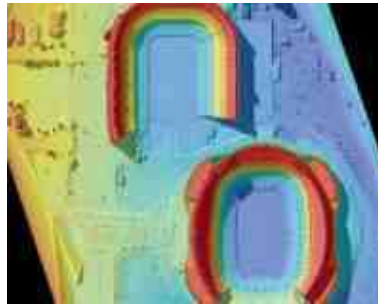
Including:

- SH 40 Sensor Head
- CU 40 Control Unit
- MM 40 Mass Memory with 540 GB;
- OI 40 Operator Interface;
- PAV30 Gyro-Stabilized Camera Mount;
- GPS Antenna L1 & L2
- ASCOT (Aerial Survey Control Tool)
- Cable

The MM 40 Mass Memory with 540 GB is sufficient for approx 6 flight hours

RC30 System Power consumption at 28 VDC approx 30 Amp.

ALS50 Airborne Laser Scanner



The Leica ALS50 Airborne Laser Scanner is a compact laser-based system designed for the acquisition of topographical and return signal intensity data from a variety of airborne platforms. The data is computed using laser range and return signal intensity measurements recorded in-flight along with position and attitude data derived from airborne GPS and inertial subsystems. The ALS50 falls into the category of airborne instrumentation known as LIDAR (Light Detection And Ranging).

The Leica ALS50 Airborne Laser Scanner is a laser-based system for the acquisition of topographical and return signal intensity data. The most versatile and powerful LIDAR (Light Detection And Ranging) system in the industry, the ALS50 can yield details under tree cover, record data at night and orthorectify imagery using specialized software. It is an especially efficient tool for generating accurate DTMs day or night, especially over large areas of featureless or densely covered terrain.

Measuring roughly 9.5 inches tall and weighing approximately 65 pounds, the compact ALS50 Scanner Assembly installs quickly and easily in helicopters and small aircraft. With scanning speeds 20-40 percent faster than competing systems, the ALS50 offers high productivity for rapid return on investment.

The ALS50 includes Leica Geosystems' AeroPlan software for flight planning.

Features:

- 83 kHz maximum pulse rate
- Four-return range detection system (1st, 2nd, 3rd and last)
- 2.8 meter vertical discrimination
- Low, 9.5 inch profile
- Flight altitudes up to 4 km AGL
- Automatic adaptive roll compensation
- Up to 75° field of view
- Optional integrated digital aerial camera

ALS 50 System - Technical Data:

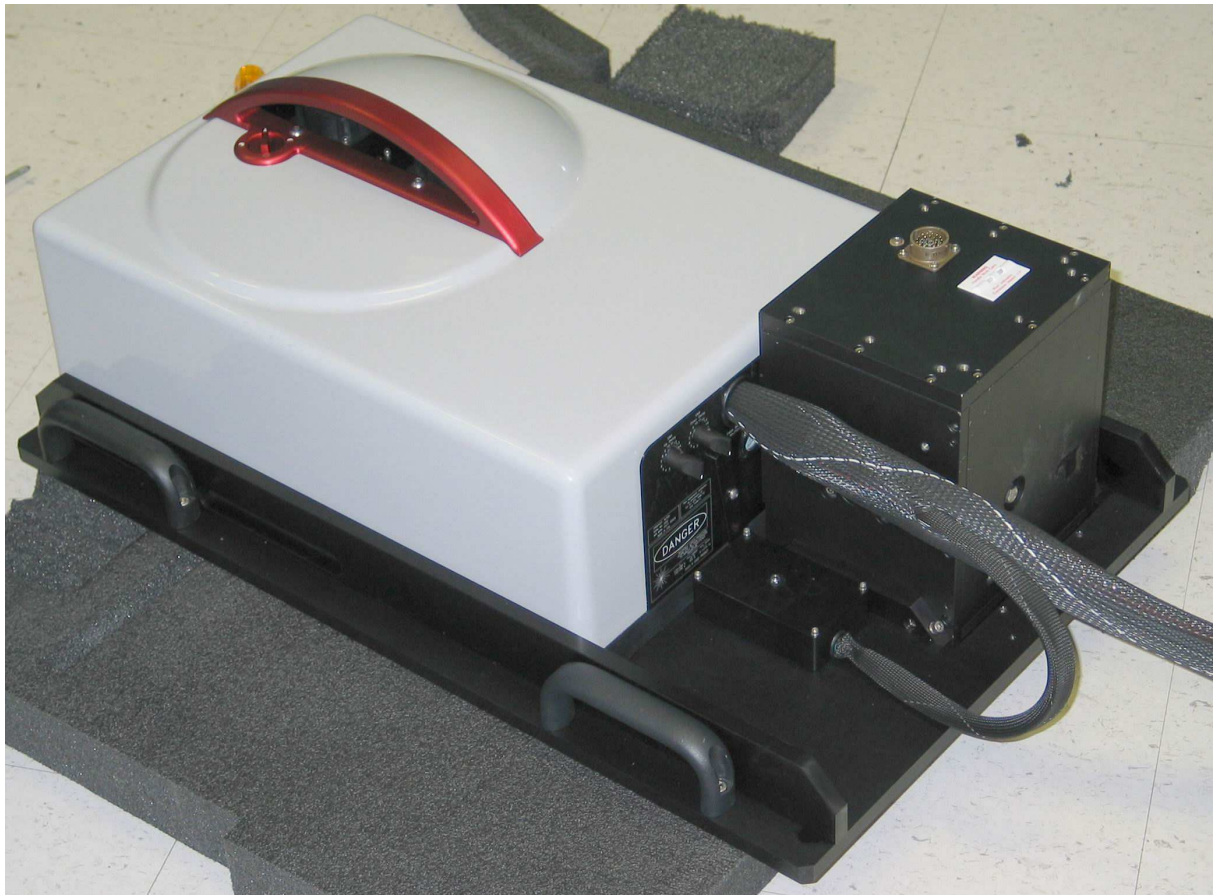
ALS 50 System weight approx 150 kg

Including:

- ALS 50 Scanner Head;
- ALS 50 Control Unit;
- MM 40 Mass Memory with 540 GB;
- ALS 50 Operator Interface;
- GPS Antenna L1 & L2
- ASCOT (Aerial Survey Control Tool)
- Cable

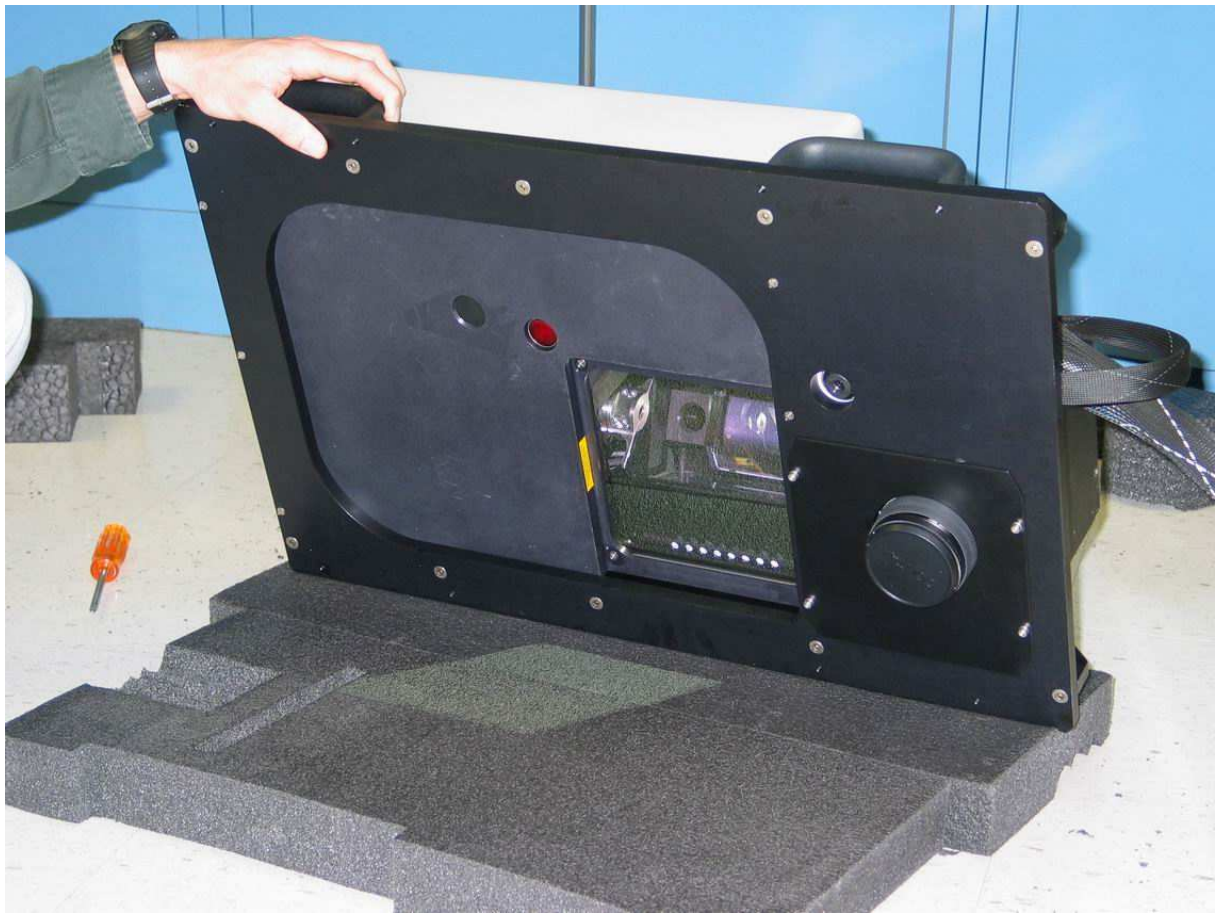
The MM 40 Mass Memory with 540 GB is sufficient for approx 8 flight hours
ALS 50 System Power consumption at 28 VDC approx 35 Amp.

The ALS 50 Scanner Head



The ALS50 can be mounted in two positions (without any limitation)

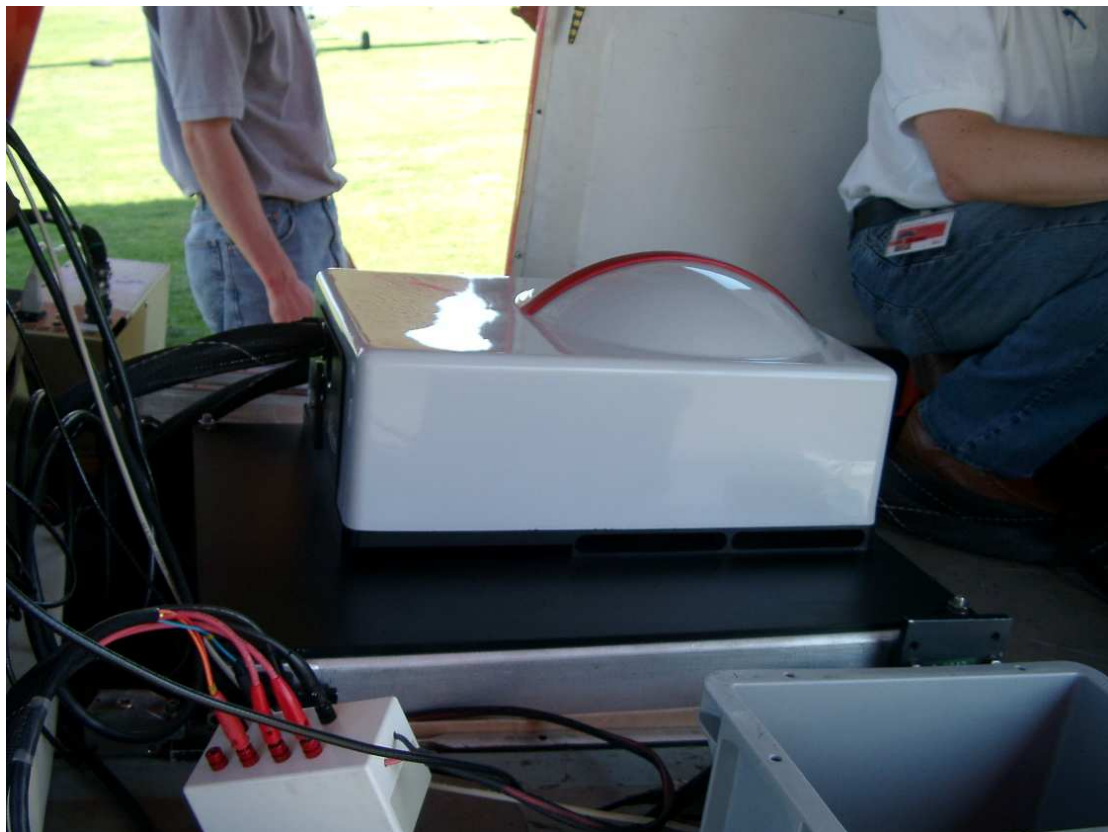
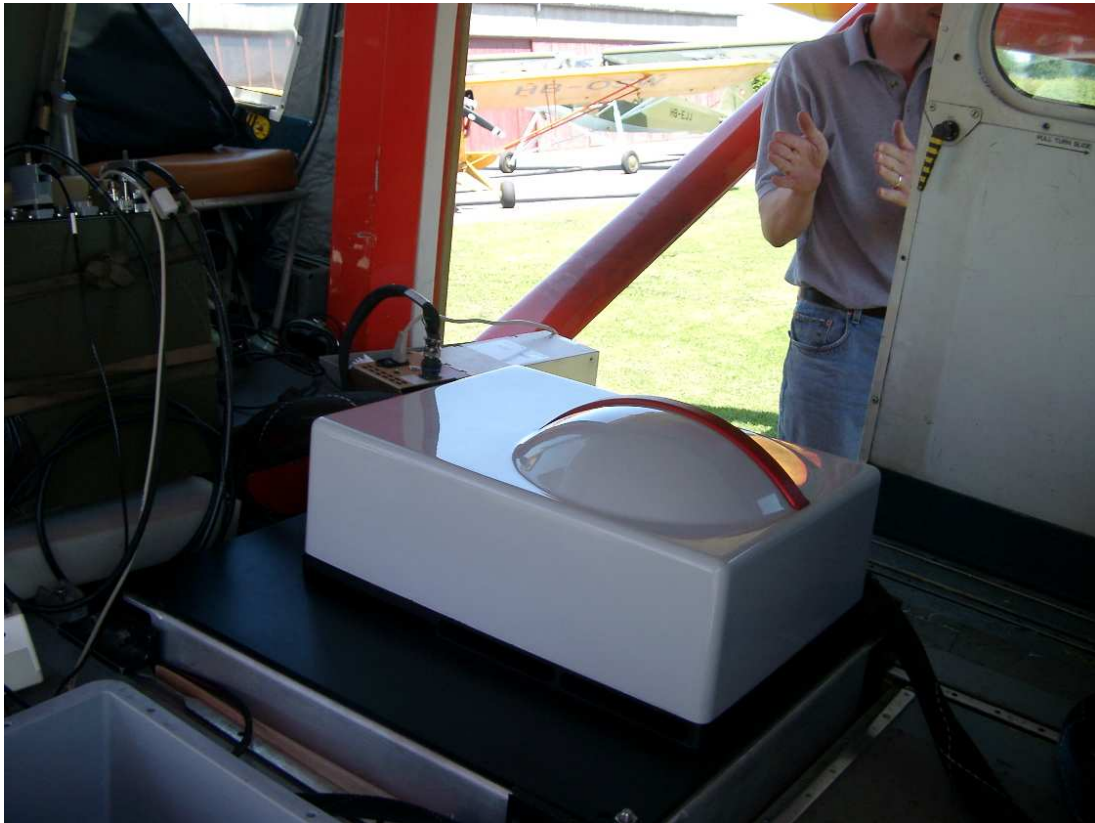
- Cables coming out in front (when looking in flight direction)
- Cables coming out in the back (when looking against the flight direction)



Here the explanation to the purpose of each of the holes on the picture above.

- Red hole: alarm lighting on every time the Laser is shooting (needed in order to comply with safety regulations)
- Small black hole close to the red hole: standard position / mounting of the ALS50 video camera.
- Small hole with optics behind: alternative position for videocam when a large frame digital camera is used in connection with the ALS50, as this is the case in the picture sent to you.
This alternative hole was mainly to keep the hole in the aircraft as small as possible.

Pictures from first installation and flight-testing in springs 2004



LEICA ALS 50 Scanner Head installed in PC-6 MSN 877 (HB-FPK)



MM 40 Mass Memory with 540 GB installed in MSN 877 (HB-FPK)



Trap Door start to opening



LEICA ALS 50 Scanner Head installation bottom view

DSW700 Digital Scanning Workstation



The DSW700 is a high performance photogrammetric film scanner for both cut film and roll film. It uses state-of-the-art technology to produce output that is both geometrically and radiometrically accurate while maximizing performance, increasing reliability and reducing costs.

This scanner is especially appealing to photogrammetric power users who need the very highest throughput, including both unattended scanning of roll film and easy change of pixel size from one job to the next.

Features:

- Fast, precise XY stage generates top quality image without resampling
- Scan black and white and color aerial photographs 25-50% faster than previous models (e.g. 12.5 μm B&W in 1.5 minutes, 12.5 μm RGB in 3.5 minutes)
- Optional film transport for rolls up to 500 feet (152m) long; autonomous operation allows operator freedom for other tasks
- Pixel size physically changeable in range 4.5-22 μm without resampling – a secondary lens is available for pixel sizes from 3-4.5 μm .
- High intensity three-color LED light source enables very dense media to be scanned quickly and with good results
- High geometric precision of stage and sensor
- High slew speeds, fast host computer, refined mechanics and sophisticated software facilitate rapid scanning
- Superb radiometric performance:
12 bit output, full fill factor CCD cells, over 3.0 OD with exposure time control
- New optical technology virtually eliminates Newton rings
- Backlight to inspect imagery and read exposure numbers
- Popular image formats compatible with popular image processing, digital photogrammetry, desktop publishing, CAD and GIS packages, including JPEG2000