# The DMC Solution

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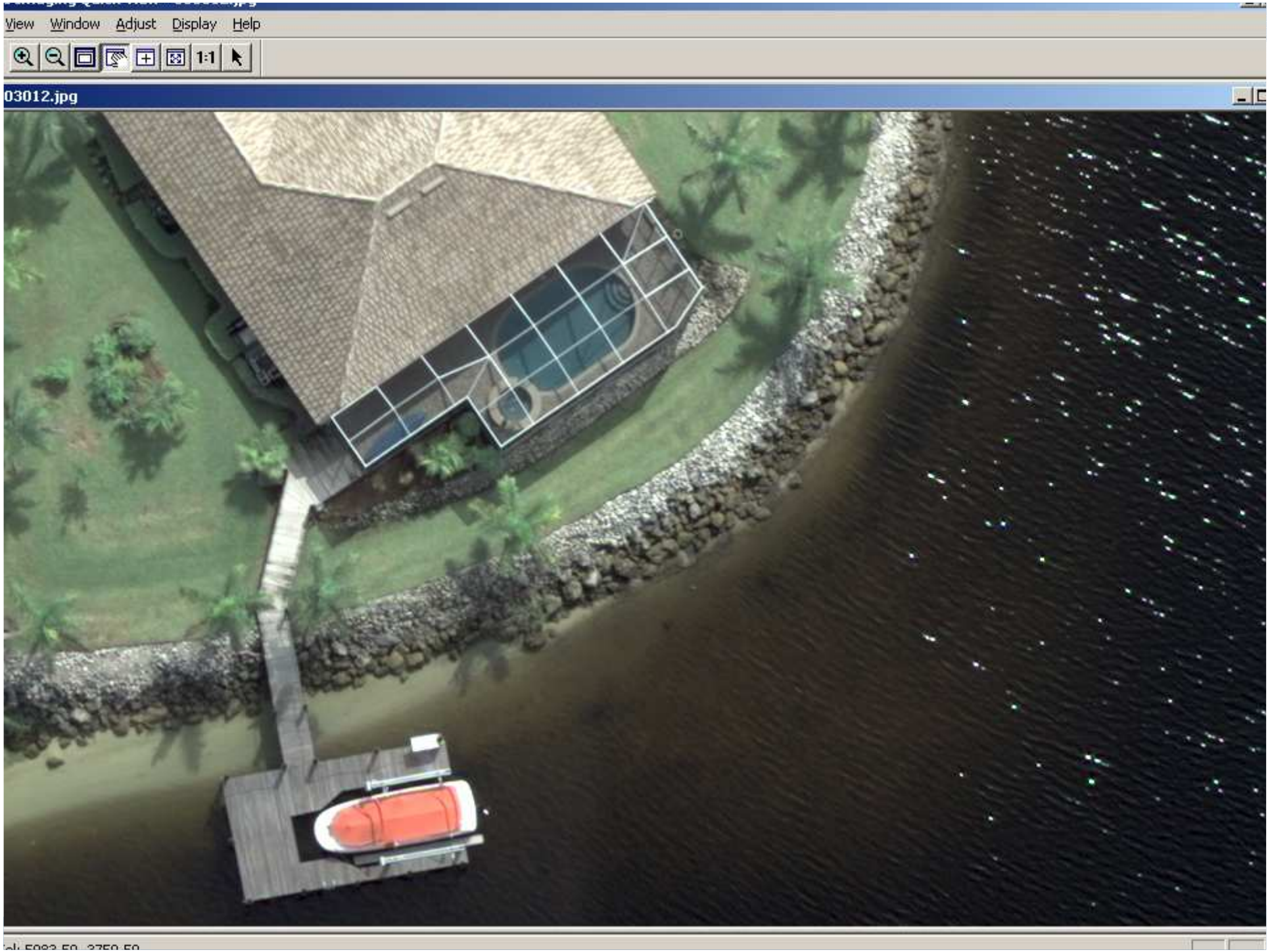
Security, Government & Infrastructure



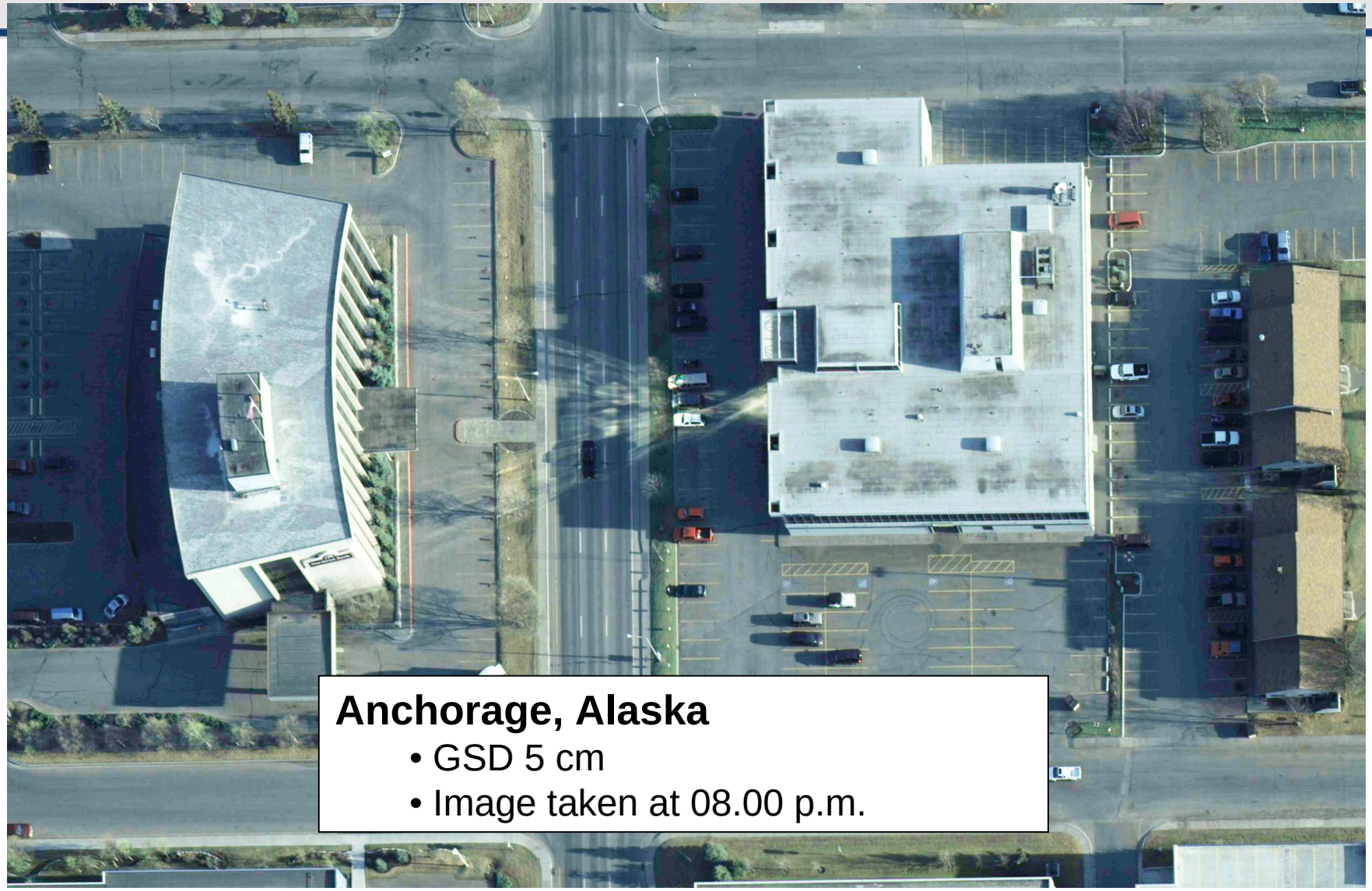
INTERGRAPH

# DMC today


- No.18 delivered
- No.26 under contract


View Window Adjust Display Help
1:1
03012.jpg

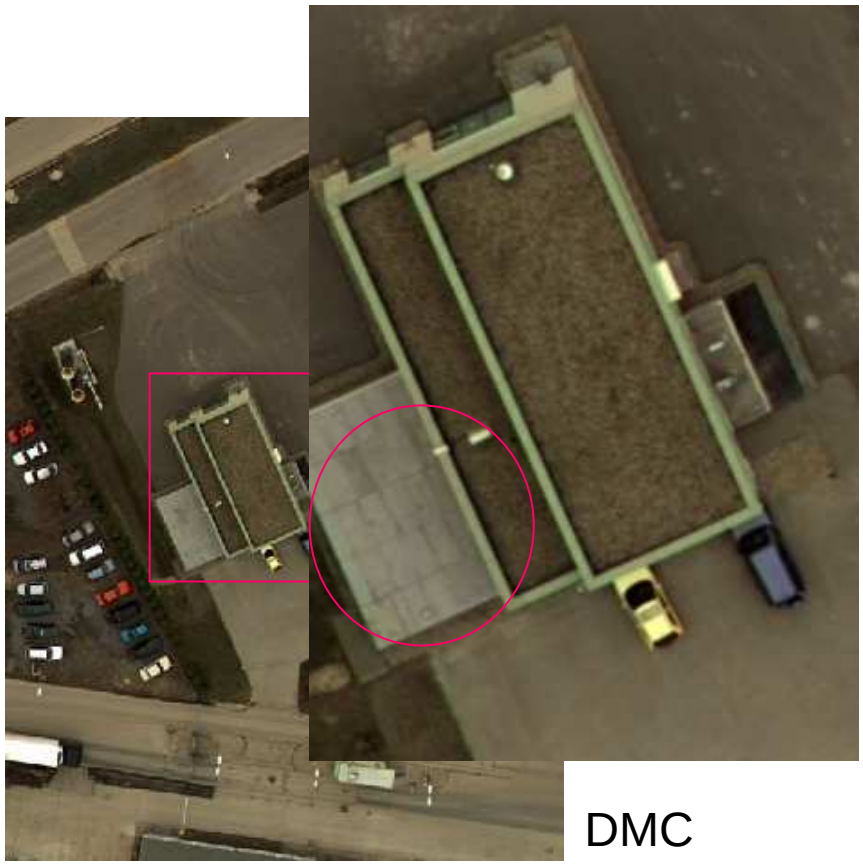
# Experience:  High Quality



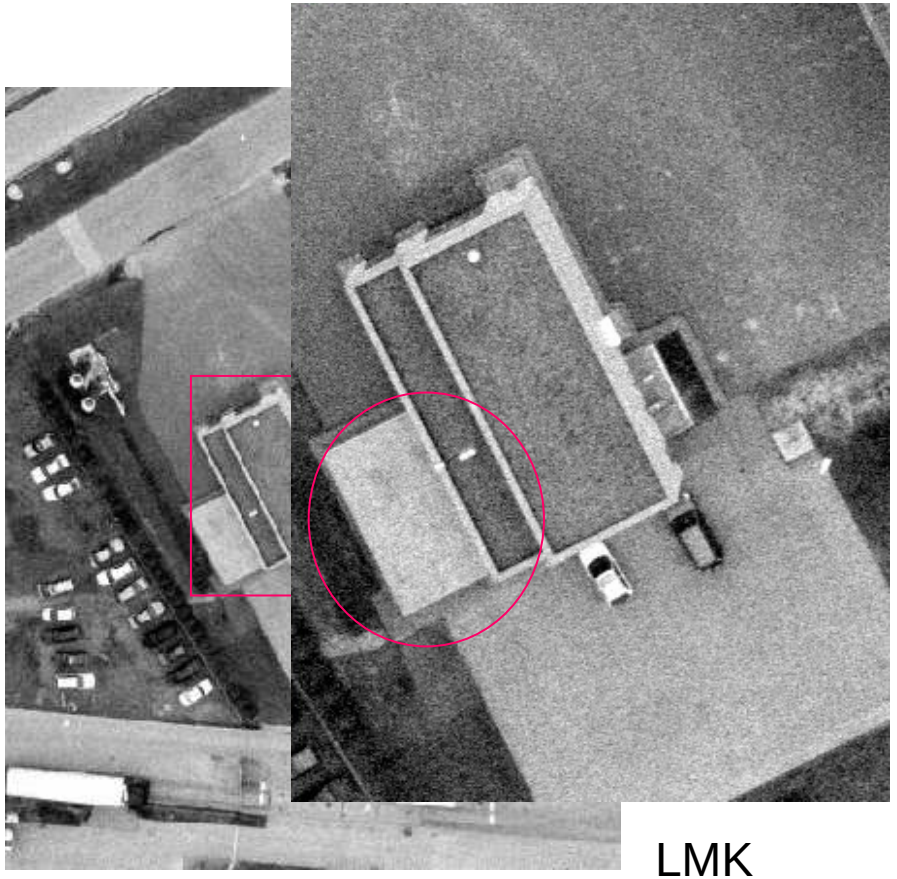
**Anchorage, Alaska**

- GSD 5 cm
- Image taken at 08.00 p.m.

# Experience: Digital over analog



DMC



LMK

# Wide range of applications



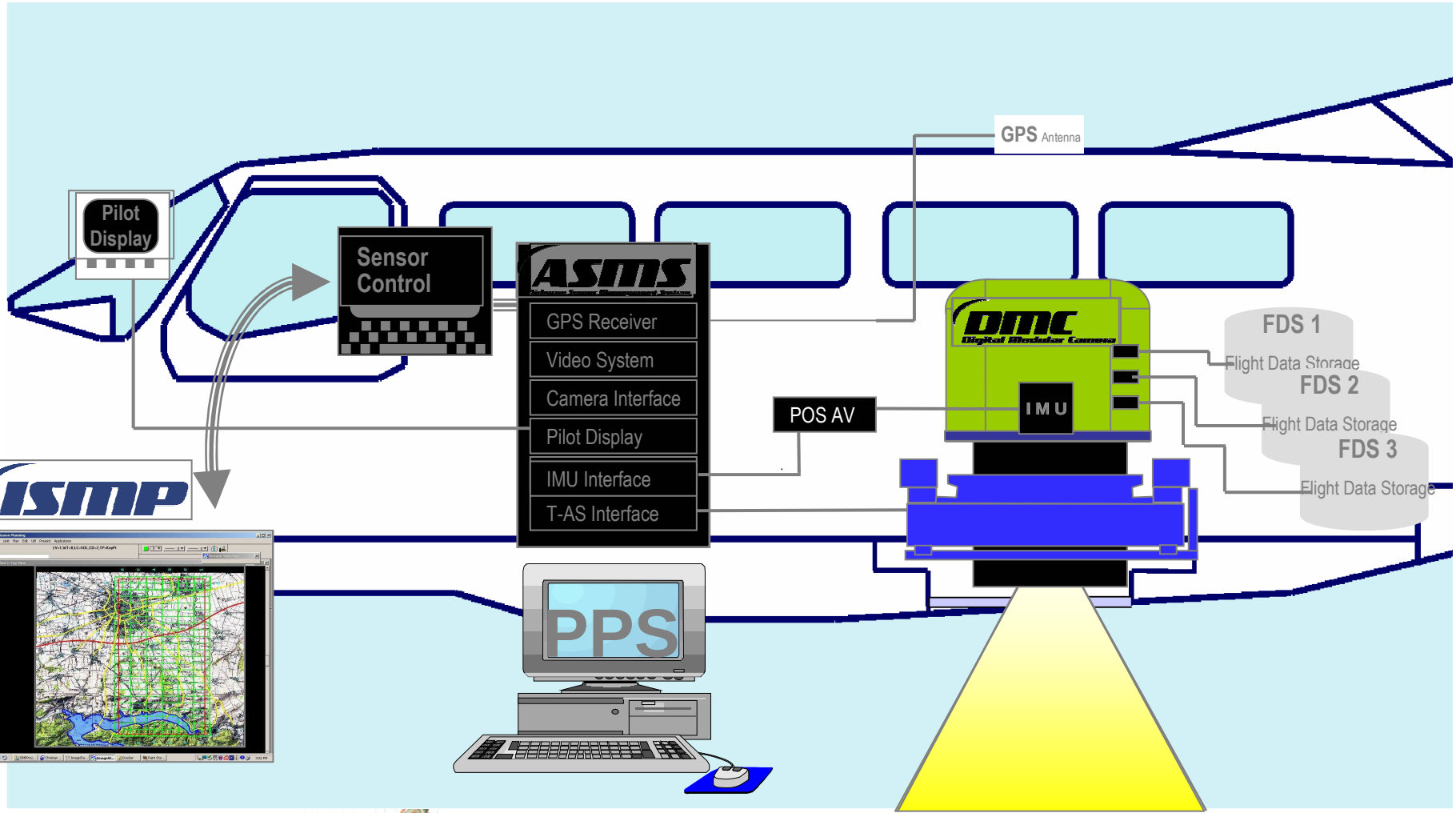
Image courtesy by

KOKUSAI KOGYO CO., LTD.

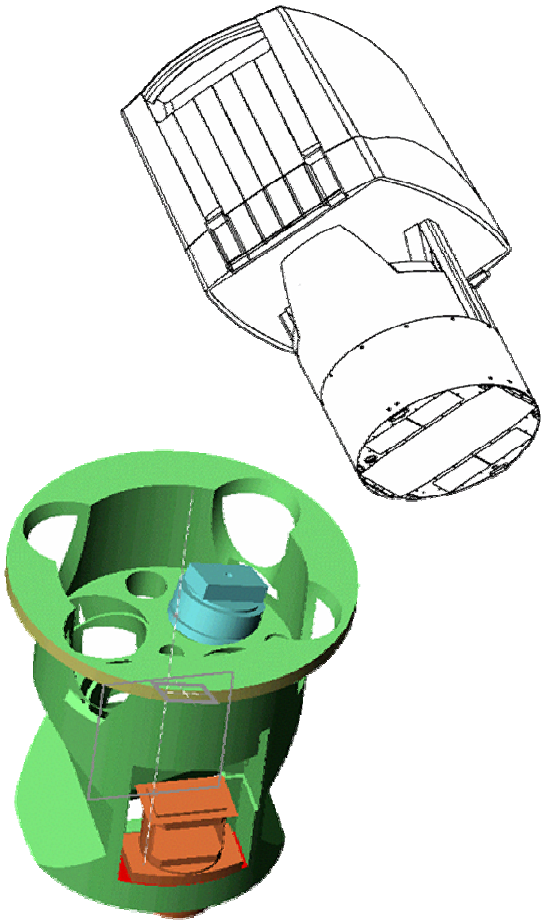
# Experience: Multi Purpose

PAN / RGB / NIR / combinations

# DMC Solution



# DMC Camera Cone



- with 4 (7k x 4k) panchromatic
- and 4 (3k x 2k) multi spectral camera heads

# DMC Technical Overview

- Large format CCD digital aerial frame camera
- Metric camera for photogrammetry
- High spatial resolution
- 12-bit radiometric resolution
- Pan and 4-Band multispectral imagery
- Forward-motion compensation
- Onboard data storage
- Airborne system management
- Post-processing ground station
- Image management & distribution



# DMC Technical Data

| | |
|---|---|
| **Field of view** | **69.3°x 42°** |
| **Panchromatic** | **13,824 x 7,680 pixel** |
| 4 optics | f = 1:4.0 / 120mm |
| **Multi spectral** | **2,048 x 3,072 pixel** |
| 4 channels | RGB & NIR |
| 4 optics | f = 1:4.0 / 25mm |
| Shutter, aperture | variable |
| Flight data storage | **840 GB = > 2,200 images** |
| Frame rate | 2 sec / image |
| Radiometric resolution | 12 bit |
| Weight (camera only) | < 80 kg |



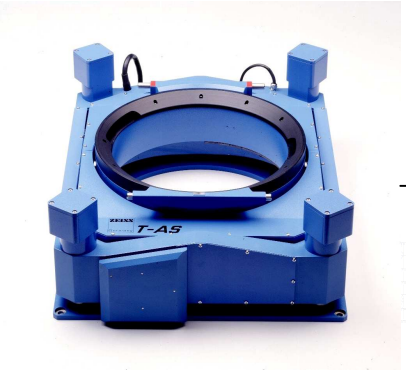
# Airborne Sensor Management

DMC

GPS

IMU


T-AS



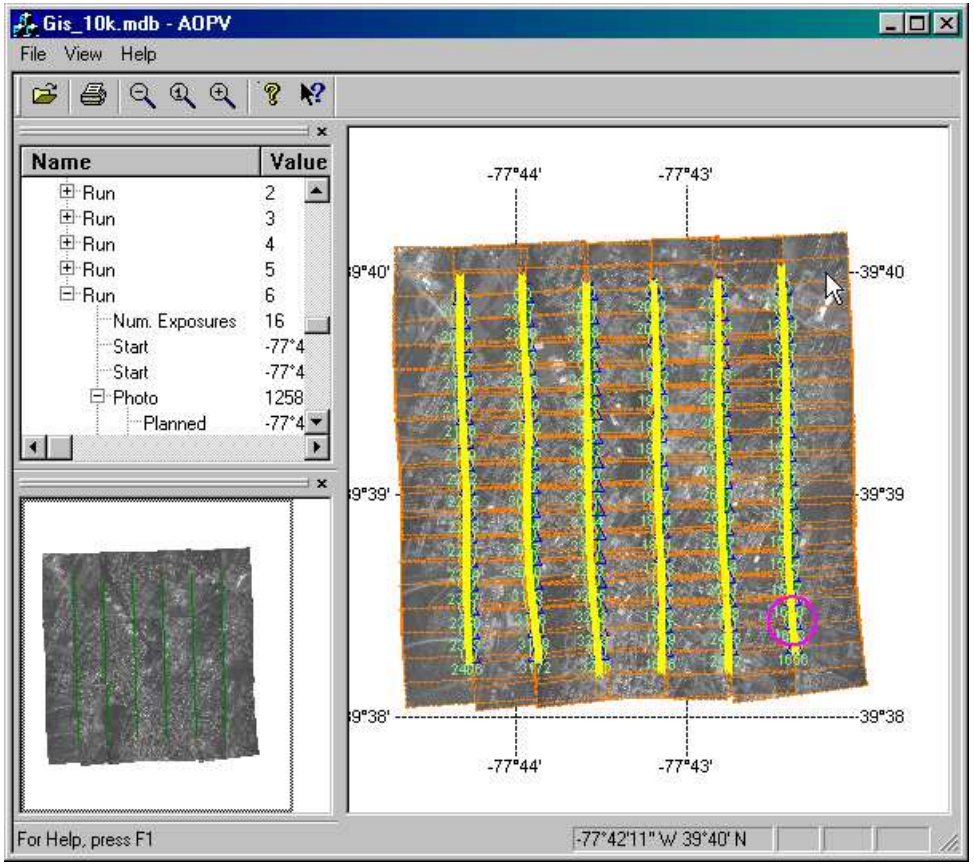

Video Camera

# Airborne Sensor Management System (ASMS)

- Integrated Management of Multiple Sensors
- Single Operator Interface
- Camera Operation (DMC or RMK TOP)
- GPS Flight Management
- Optional Applanix IMU
- Video Viewfinder



# AOPV
# Airborne Onboard Project Viewer

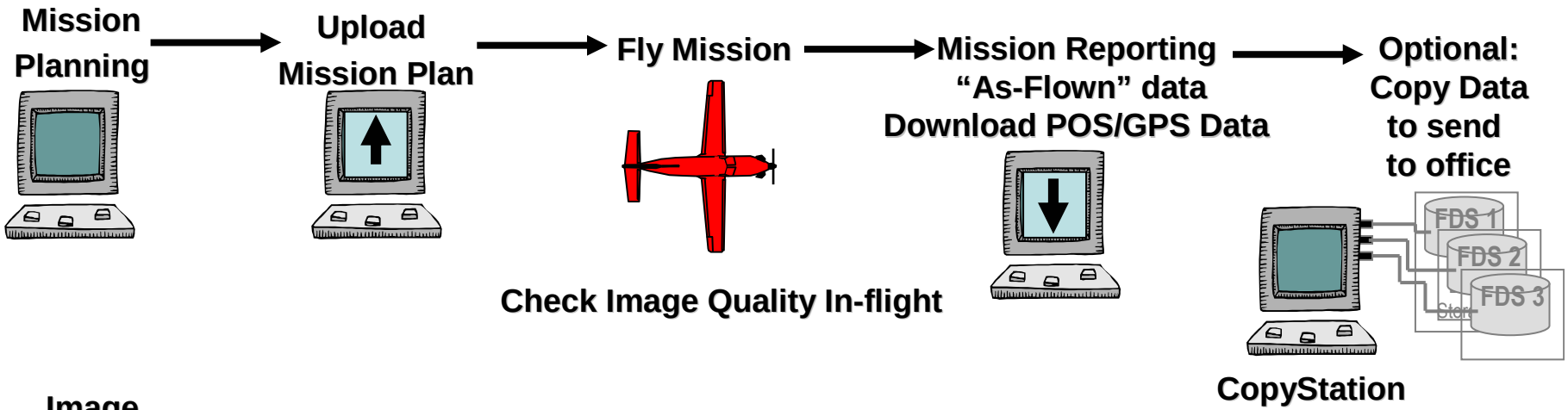



- **real time video information**
- **real time project status**
- **real time project overview**
  including flight lines and image centers
- **mosaic of mission area**

# Flight Data Storage FDS

- **Extremely reliable and robust**
- **Pressurized, hardened enclosures**
  - **Passed DO 160 Standard**
  - **Designed for use at up to 8000m non-pressurized**
- **Small, light weight**
- **Standard interface technology**
- **Flexible aircraft installation**
  plug and play, no tools required,
  no cables to be disconnected
- **Storage capacity 288 GB each**
  3 units required, equivalent to 2240 images
  (PAN+RGB+CIR )

# DMC Workflow



# DMC Post Processing Software

- Consideration of LUT to easily improve/modifyimage appearance
- Improved color stability of RGB and NIR images
- Now Possible to batch process Dodging-Utility after images have been written to disk
- Generation of LUT with DIA-Tool (DMC Image Analysis) for tonal adjustments, color balancing and contrast / brightness correction
- Improved handling for 8-Bit image output
- JPEG2000 output
- Automatic correction of possible gaps or slivers due to high TDI values

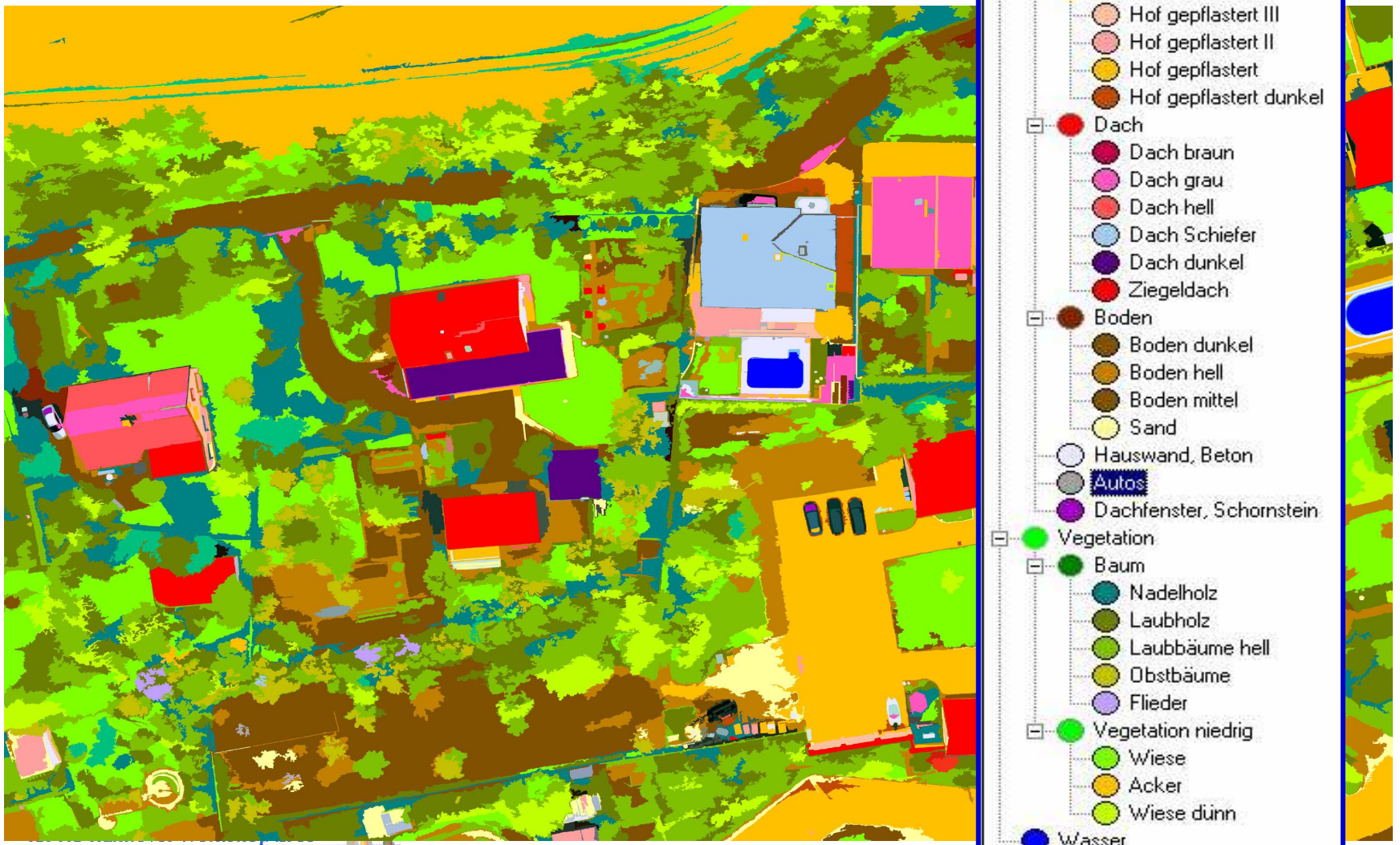


# DMC Image Analysis (DIA)

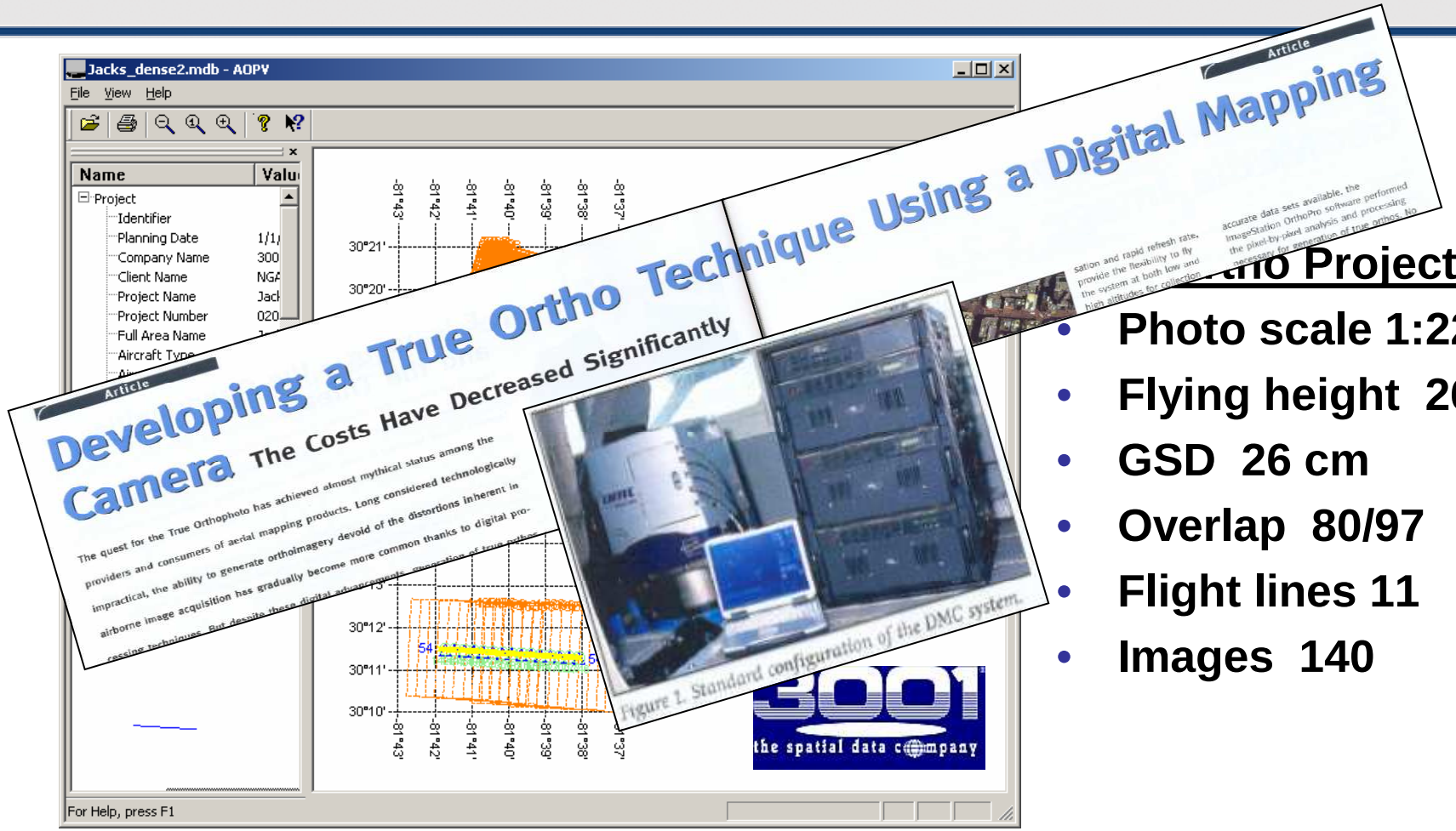
- Histogram display and write function
- Generation of LUT for tonal adjustments, color balancing and contrast
- Brightness correction
- Online preview of tonal adjustments
  - New image balancing software



# Experience:  New Applications



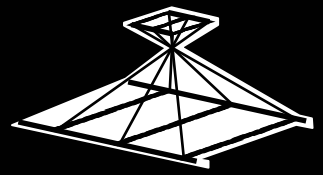
# Experience: New Applications




**Project**

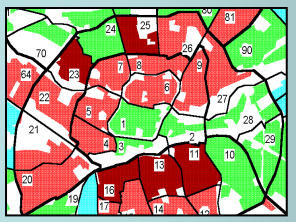
- **Photo scale 1:22608**
- **Flying height 2600 m**
- **GSD 26 cm**
- **Overlap 80/97**
- **Flight lines 11**
- **Images 140**

# DMC – Market Positioning



line sensor < 40%

line w/o FMC



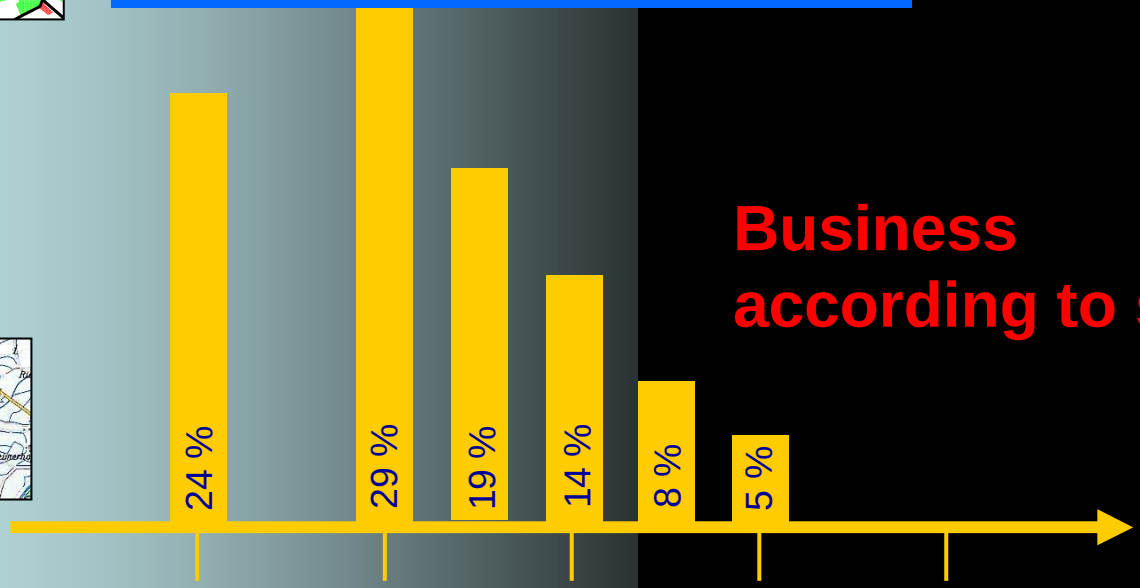
DMC = 100 %

Matrix with FMC

RMK = 100 %

23 cm Film with FMC

**Business according to scale**

# DMC Benefits



# Fast Results

| | | |
|---|---|---|
| ISMP – Mission Planning | 7:00 – 7:30 h | *30 min* |
| Photo Flight | 7:30 – 9:00 h | *1 h 30 min* |
| ISMP – Mission Reporting | 9:00 – 9:10 h | *10 min* |
| PPS | 9:10 – 14:40 h | *5 h 30 min* |
| Aerotriangulation | 14:40 – 16:10 h | *1 h 30 min* |
| Automatic DTM Generation | 16: 10 – 17:40 h | *1h 30 min* |
| Orthophoto Generation | 17:40 – 21:40 h | *4 h 00 min* |

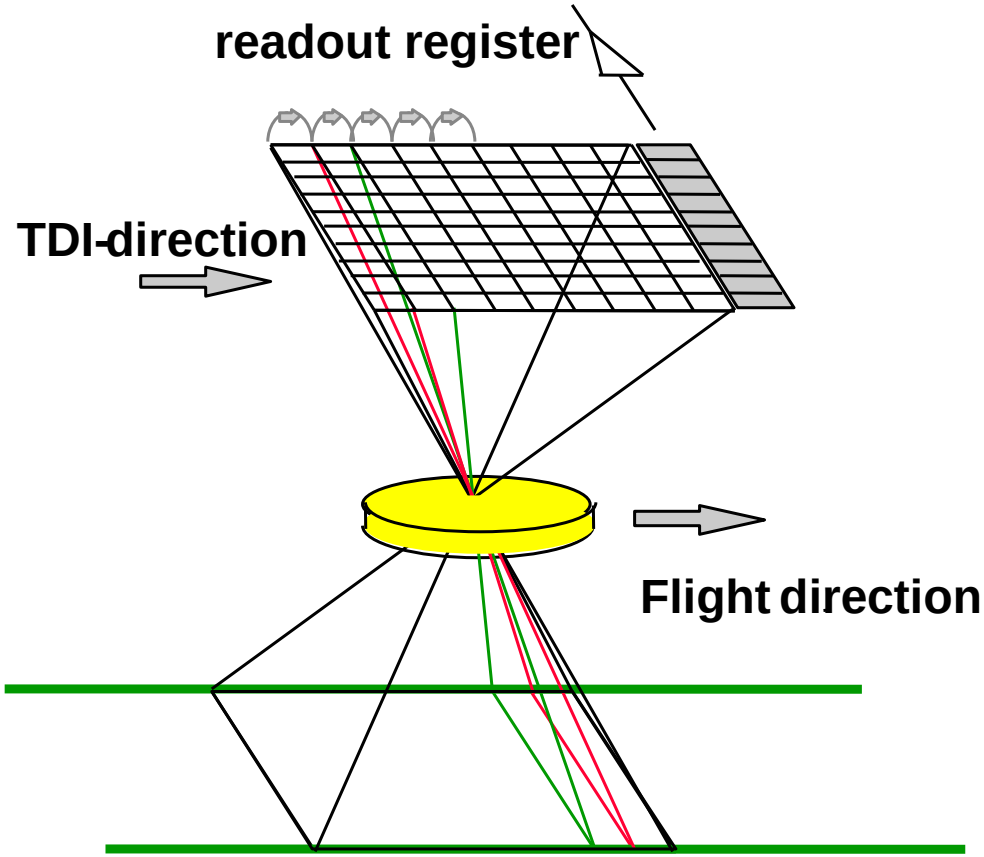
- *Total project time : 14 h 40 min*

# DMC among Line Sensors

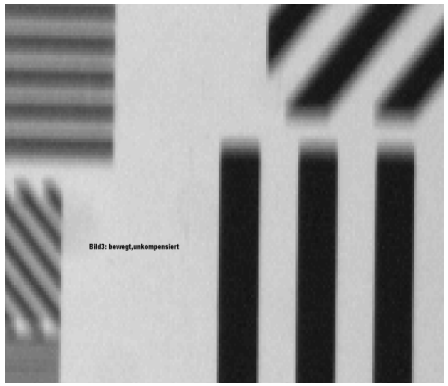
- a very stable and precise image geometry
- does not require a GPS/INS system ( optional )
- “central perspective”  image data
- wide range of applications
- image data can be processed with any standard softcopy system on the market

# DMC among Line Sensors

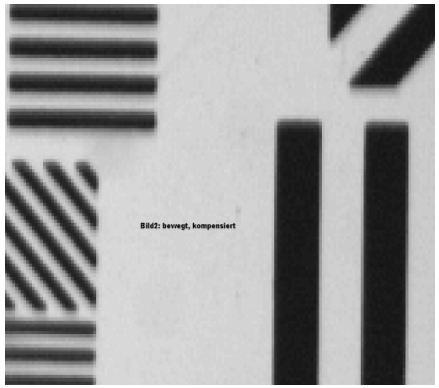
has Forward Motion Compensation FMC implemented through TDI ( Time Delayed Integration )




**moving target, uncompensated**




**moving target, compensated**



# DMC among Line Sensors

in combination with a 12 Bit radiometry it produces outstanding results even in unfavorable weather conditions

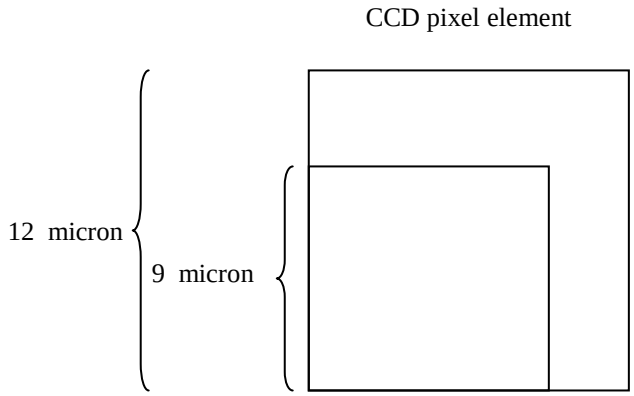
- Higher Sensitivity -> **Extended flying days**
- Improved image quality **-> more shadow details**

# DMC among other Frame Sensors

- uses high grade industry components for safe and reliable aircraft installation ( high grade connectors, environment tests against DO160, a minimum of cable connections, crash load tests against DO160 )
- single vendor supplier. The complete camera system including all components and peripherals provided through a single source, Intergraph - Z/I Imaging
- product quality and operational stability supports operational cost savings for the user

# Excellent Image Quality

**Large pixel size in combination with a 12 Bit radiometry produces outstanding results even in unfavorable weather conditions**



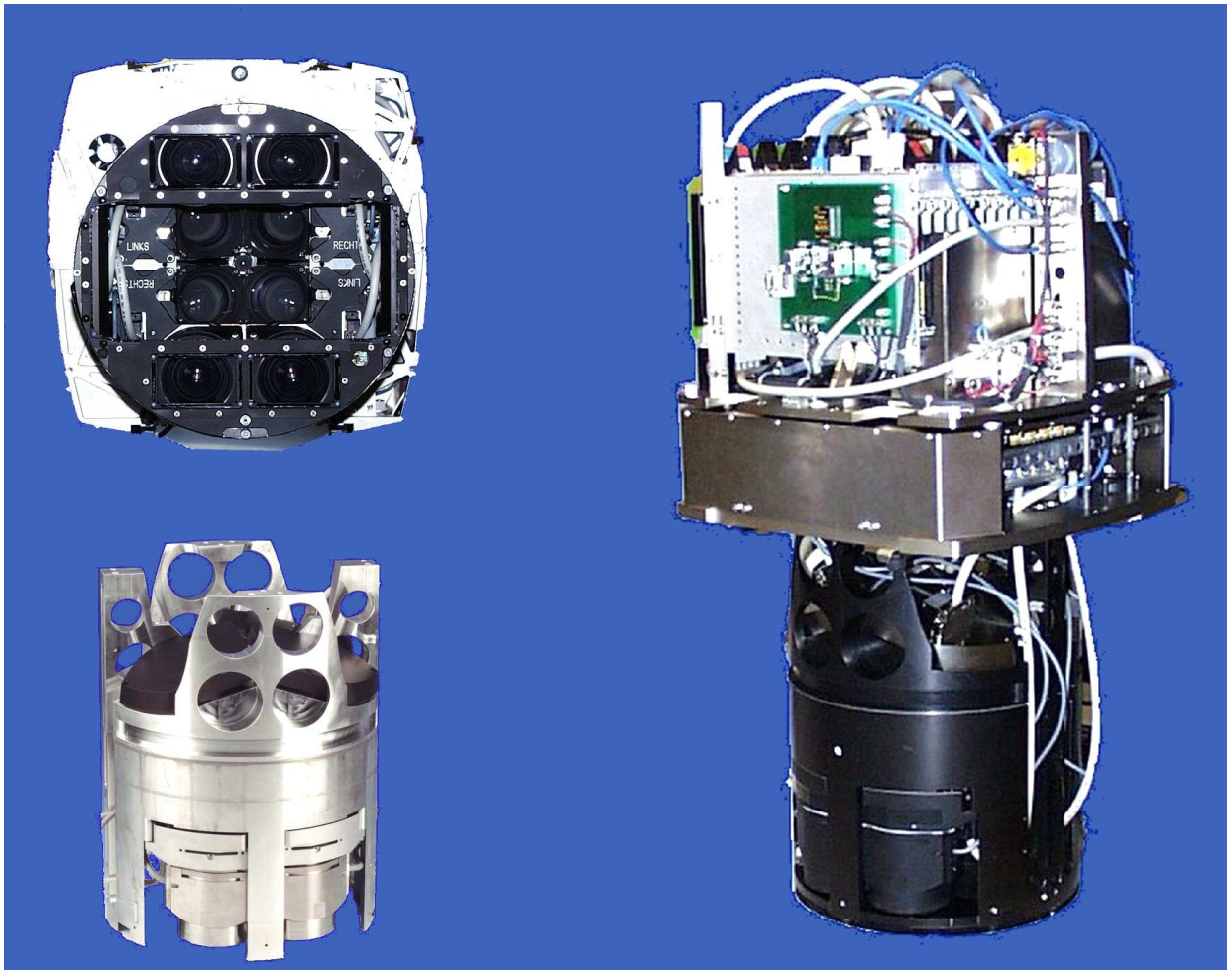

**A 12 micron CCD has 77% more light sensitive area comparing to a 9 micron CCD element**

larger CCD elements have a **higher sensitivity**

-> better **image quality**

-> more **shadow details**

# Reliable and robust design



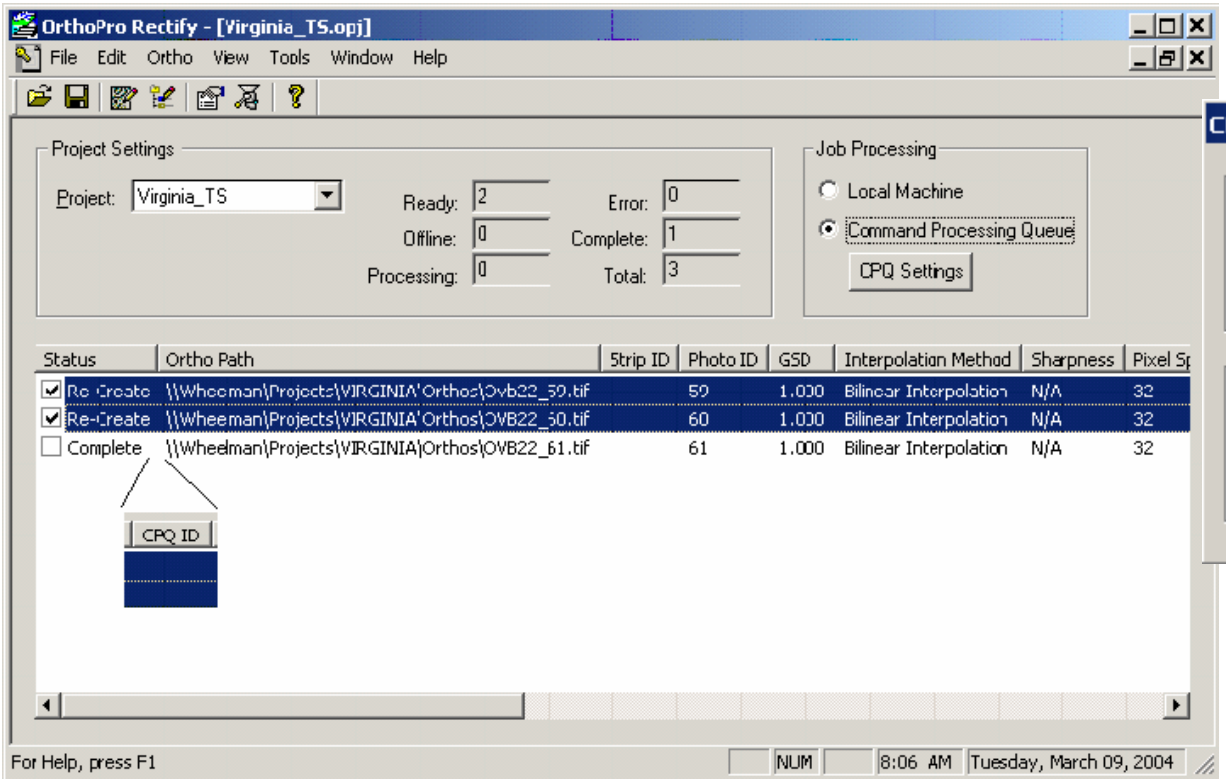
# Investment into Quality

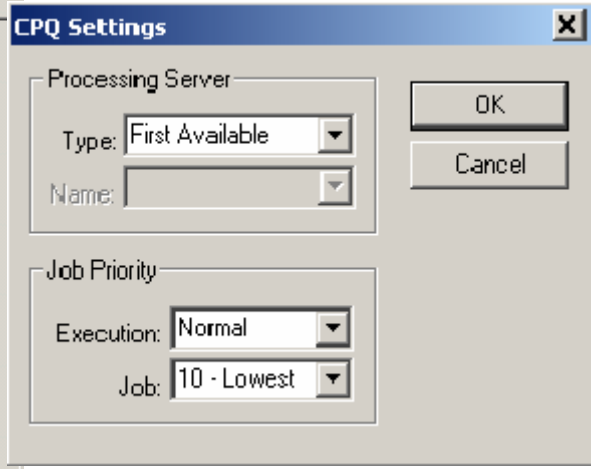

## *Expiriences from decades: Carl Zeiss & Intergraph*

**Aerial Survey Cameras** are used in very rough conditions

- extremely high and low temperatures
- high and low humidity in rapid alteration
- schock and vibration loads

# Distributed Processing = *fast throughput*




TerraShare

# DMC among other Frame Sensors


- **plus 20% ground coverage**
- **20% less flying time**
- **thus reduced image acquisition costs**

➢World largest format commercial digital frame camera

➢ savings of flying cost

# DMC Benefits - Summary

- Extended Flying Window of Opportunity
  **Up to 20% increase in flying day / season length, due to DMC's higher radiometric sensitivity**
  **eg, an extra 1.5 hrs per day / 6 weeks per year**
- Return on Investment
  **Up to 15% reduction in operational costs & materials compared to film-based systems**
- Faster Delivery
  **Quicker image data turnaround = reduced map revision cycles**
- Maximum Productivity / Minimum Downtime
  **High reliability, local service engineers & spares facilities**
- Competitive Advantage
  ***DMC lets you to bring new & better products to market faster & cheaper than others***



# DMC is accepted worldwide

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