GEOPROCESSING, ARCHIVING & SHARING HISTORICAL AERIAL IMAGES

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PROCESS

Acquisition

Conservation (ANALOG)

Conversion (ANALOG)

OrthoRectification

E-archiving

Diffusion
4 IGN Beechcraft planes regularly flying over the territory for mapping purposes.

IGN air base is in Beauvais, 80 km North of Paris.
First war: first aerial photos.

50’s: first national coverage.

... Coverage every 5/10 years (30K).

2003: IGN’s digital camera.

... Coverage every 3/4 years (25 cm/pix).
“Photothèque nationale”, the IGN’s national aerial photo library

3 million aerial photos on France

1 million on the former French possessions

Villefranche-sur-Cher, 200 km South of Paris
2007-2017: national territory’s coverage converted

Glass plates and films, various formats and scales

B&W films 1200 dpi
Color films 900 dpi
Glass plates 750 dpi

Delivery JPEG 2000 uncompressed
CONVERSION ANALOG PROCESS

Preparation
Converting films & glass plates (outsourcing)
Repackaging (outsourcing)
Digitizing flight plans & metadata
Quality controls & post-processing
Flight plan

Acquisition campaign

Sensor format
Focal lens
Date...

Aerial photos

Image quality
Cloud cover
Reflections
Damages
Duplicata or prints available
ORTHORECTIFICATION SPECIFICATIONS

Converted analog
1950-65 (1965-80)
JPEG 2000
Lambert 93
50 cm / pixel
Alti grid 25m

Native digital
JPEG 2000
Lambert 93
20 cm / pixel
Alti grid 10m
ORTHORECTIFICATION
PROCESS 1/2 GEOMETRY

Orientation
Theoretical beam modeled from the camera calibration certificate. Before 1970, possible errors of several pixels.

Aerotriangulation
Support points measured on orthophoto of IGN’s large scale database (RGE, 5m/pix). Common points automatically calculated.

Calculation
Image correction with internal orientation and aero-triangulation models. IGN’s DTM used for global computing (Pitch : 25m histo / 10m recent)
Mosaicking

Difficulties due to imprecision of the models used upstream: geometry (orientation, relief) and radiometry (veil, vignetting, different dates).

Radiometry

Since 2003, the recording of the shooting conditions by the digital camera has made it possible to automate and improve this stage.

Prior to 1970, the use of short focal lengths generated vignetting, difficult to eliminate.
E-ARCHIVING

Double archiving
Magnetic tapes
Converted analog
JPEG 2000 uncompressed
250 To
Metadata ISO 19115/19139

Native digital
JPEG 2000 compressed x 5
70 To
DIFFUSION
STORAGE

Oshimae, interministerial hosting platform (object storage)
Store « Geoportal »
ISO 19115 / 19139

Pictures for download
JPEG 2000 – 60 To
B&W compressed x 5
Color compressed x 10

Orthophoto for streaming
JPEG 2000 lossless compressed
250 To
WMTS displaying (JPEG)
Historical Ortho 1950-1965 can be displayed and overlapped to other data on the Geoportal.
Programming library
Javascript, HTML, CSS

Usable with main GIS
QGIS, ArcGIS, GeoConcept, IGN
Map, FME, OGR

Compatible with main cartographic web tools and libraries
Leaflet, Open Layers, iTowns,
Google Maps API, 3D Cesium JS
REMONTER LE TEMPS  SCREENSHOT « COMPARING »
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THANK YOU FOR YOUR ATTENTION