A RANDOM AERIAL PHOTOGRAPH: DATING A HISTORICAL IMAGE BY CROSS-REFERENCING SOURCES

The Italian National AirPhoto Archive tells...

by Gianluca Cantoro, Giampiero Federici

The Italian National AirPhoto Archive (Aerofototeca Nazionale – ICCD, MiC) preserves one of the richest collections of historical aerial photographs in Europe. Among the millions of images are vertical views, oblique perspectives, and photographs produced by both military and civilian operators. One particularly striking picture depicts a jet flying low over Verona. The image, though visually impressive, is undated (as it sometimes happens for several reasons in historical archives), which greatly reduces its historical value. Without a precise temporal frame, the photograph risks remaining a beautiful curiosity rather than a solid historical source. The challenge, therefore, is to reconstruct its date by carefully cross-referencing visual, historical, and environmental clues.

Fig. 1 - Our "random" -oblique- photograph from the Italian Airforce with the caption "Verona – L'Arena e Piazza Bra". Indeed, the angle and clarity of the image allow for the identification of several landmarks, including the Arena di Verona and Torre dei Lamberti. In the top right, a silver airplane in flight. Italian National AirPhoto Archive (Aerofototeca Nazionale – ICCD, MiC); image reference AM collection, unknown date, neg. 173146.

The Image and Its Context

The oblique black-and-white photograph shows the city of Verona with the Roman Arena in clear view. A jet aircraft dominates the composition, caught in flight as it passes over the city. From the perspective of the photo, it appears that the aircraft approached from the direction of Lake Garda, swept across the Adige River, and then climbed beyond the urban area. Calculations based on the likely camera and lens combination, together with the size of identifiable landmarks, suggest that the photograph was taken from an altitude of roughly 800 to 1000 meters (thus capturing the jet at an even lower altitude). Such a relatively low level offered a dramatic view of both the aircraft and the city. This reinforces the interpretation that the purpose of the image was less about documenting construction or urban fabric and more about celebrating the aircraft itself, perhaps in connection with an airshow, civic holiday, or military demonstration (fig.1).

The Airplane in the Scene

Closer inspection of the aircraft reveals several unmistakable features: arrow-shaped swept wings, two large underwing tanks, and a distinctive tail configuration.

These details identify the jet as a Republic RF-84F Thunderflash. This was a reconnaissance variant of the F-84F Thunderstreak, developed in the United States in the early 1950s. Unlike its predecessor, the Thunderflash was designed from the outset for tactical reconnaissance. It replaced the traditional nose intake with a rounded nose housing multiple camera systems, while the air intakes were moved to the wing roots. The aircraft was capable of carrying up to six different cameras for vertical, oblique, and forward-facing photography, making it an essential intelligence-gathering tool in the tense atmosphere of the Cold War. With a top speed exceeding 1,100 kilometres per hour, the RF-84F combined speed and precision, qualities that were vital for low-level reconnaissance missions.

For Italy, the arrival of this jet represented a leap forward in technology and in strategic posture. Under the Mutual Defence Assistance Program, Italy received 78 RF-84F Thunderflashes between 1955 and 1956. They entered service with the 3rd Aerobrigata at Villafranca, near Verona. The presence of this aircraft in Italian skies marked a decisive transition from piston-engine reconnaissance planes to jet-powered machines aligned with NATO standards. The jet captured in the Verona photograph carries the tail number 7397 and fuselage code 3-38, both of which provide essential clues for narrowing down its date. Military records confirm that these codes changed over time, which allows historians to bracket the period when such markings were in use (fig.2).

Fig. 2 - Detail of Figure 1 with the airplane with tail number 7397 and military (fuselage) code 3-38, captured during its flight over Verona (Northern Italy). The Jet Airplane with this coding belonged to the 132nd Group RT of the 3rd AeroBrigade.

TOWARDS THE DATING OF THE PHOTOGRAPH

The question of dating the photograph can be approached from several angles. First, we know that aircraft number 7397 entered Italian service in February 1956. This gives us the earliest possible date for the image. Secondly, we can compare the photograph with other aerial and ground images of Verona from the same period. The Philharmonic Theatre, for example, was heavily damaged during the Second World War. In the oblique photograph it is still standing in a ruined state. By 1958, however, vertical photographs taken from higher altitude show that the ruins had been cleared. This immediately places our photograph before 1958 (fig.3). Another important clue comes from Ponte Pietra, the city's Roman bridge over the Adige. Destroyed by retreating German troops in 1945, it was provisionally replaced with a metal structure. Reconstruction of the stone bridge began in February 1957 and was completed in 1959. In our photograph the temporary structure is clearly visible and no reconstruction work seems to have started (fig.4). This narrows the timeframe further to the period between early 1956 and the beginning of 1957.

Environmental evidence adds another layer. The river in the photograph appears full, suggesting springtime snowmelt from the Alps. The trees are in full foliage, outdoor cafés are set up, and shadows are short, indicating a time when the sun was high but before the dryness of late summer. Meteorological records for 1956 show peaks in river levels in May and June, corresponding closely with the visual evidence. These elements together suggest that the photograph was taken in late spring or early summer 1956, most likely around May or June of that year.

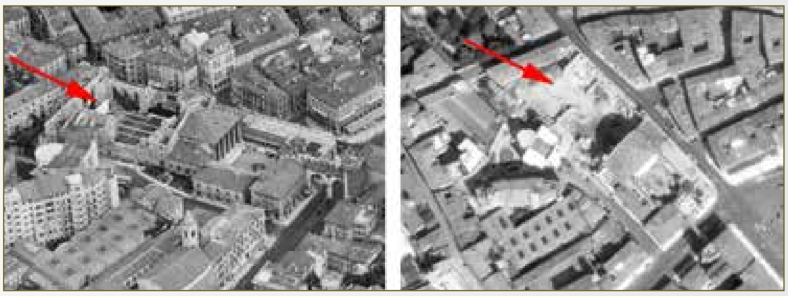

Fig. 3 - Left, detail of the Philharmonic Theatre, bombed in 1945, behind the Museo Lapidario. Note the chairs organized in a grid and white screen presumably for theatrical plays; Right, detail of a vertical photograph dated 1958.

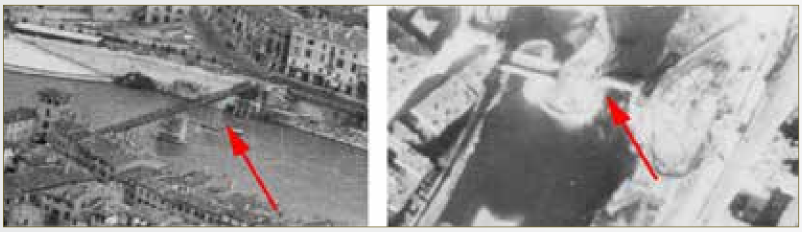

Fig. 4 - Detail of our undated photograph against another aerial photograph dated January 29th, 1957.

Thus, with all the above, we can gradually narrow quite a lot the dating, we can narrow quite a lot the dating of our photo, arriving to a time/span between February 1956 (date of arrival of the airplane in Italy) and January 1957. If we include also the environmental considerations, we could consider the historical data of precipitation in Verona (ISPRA dataset) in 1956 and the Adige River's water level at Verona for the same year (Annali idrologici, Ufficio idrografico del Magistrato alle acque, Venezia. Parte 2[1]) (fig.5).
These two charts give us some clues about the rainiest months of that year and the water level per month against the annual mean, and we can appreciate the peaks in May-June and October-November. If it was to choose between one of these two time-windows, probably the first would look more realistic, for the following reasons:

-The Adige seems still quite full, and this suggests we're likely seeing the effects of spring snowmelt from the Alps, which typically peaks from late April through June. By late July–August, the river usually runs lower going towards the late- summer drought, unless there's unusual rainfall.

- No particular shadows (or very short ones) can be spotted in the photo, probably suggesting a sun high in the sky but not yet at the deep-summer drought stage.

- Trees present full and lush foliage, and no autumn leaf drop or bare branches seem to be present, ruling out winter and late autumn.

- Our oblique photograph shows sunshade and gazebos in the patio and dehors of bars and cafes in the Bra square and, as we mentioned earlier, chairs are organized in rows in the open space of the (bombed) Philharmonic theatre, suggesting that time passed since the notorious cold of February 1956 (temperature in Verona was documented to be as low as -18° Celsius) and weather is more compatible with outdoor living.

Why Dating Matters & Methodological Framing

Determining the date of a historical aerial photograph is more than an academic exercise. A precisely dated image gains value as a document for multiple disciplines. In archaeology, as shown by Scardozzi (2010), historical aerial imagery has been fundamental for recovering the outlines of ancient landscapes in Italy and Turkey. Carta (2018) has used diachronic aerial photographs to track landscape change on Elba Island, providing a basis for tourism management and conservation policies. Other applications (Cantoro 2017a and b; Cowley & Stichelbaut 2012) has shown how oblique aerial imagery can be used to interpret difficult WWII landscapes in southern Italy, and how combined aerial and ground surveys can provide digital documentation of archaeological heritage. These examples all highlight how an undated photograph, once properly placed in time, becomes a reliable tool for historical, environmental, and cultural research.

Conclusions

By cross-referencing details of the aircraft, the cityscape of Verona, and environmental evidence, the undated oblique photograph can be assigned with confidence, at the best of the current knowledge, to the late spring of 1956. This seemingly simple flyover captured far more than a jet above a city: it documented the arrival of a new era in Italian aviation, the resilience of Verona's urban fabric after the war, and the importance of dating in giving archival materials renewed life. What began as an anonymous image becomes, through careful interpretation, a window into a transformative moment in Italy's postwar history.
While the aircraft's physical presence over Verona is documented photographically, the experience of operating the RF-84F is cap-

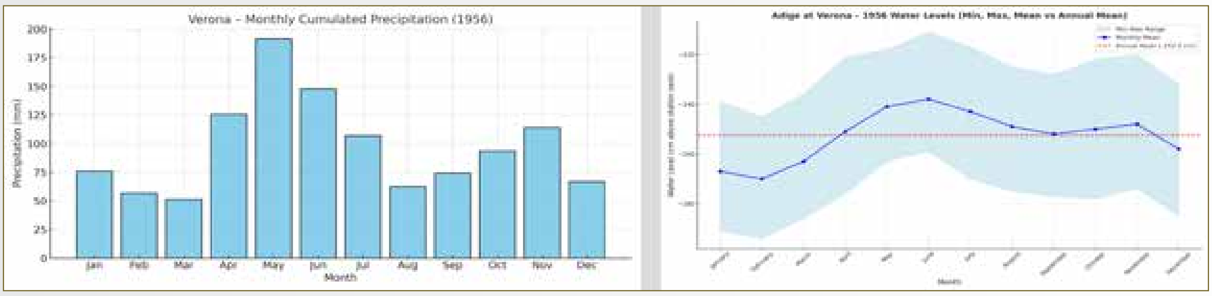

Fig. 5 - Rainfall data and Adige River water level in 1956.

tured in anecdotal records and oral history. Though direct quotations are rare, composite testimony reflects the technical demands and emotional resonance of flying such missions. Navigating rugged terrain at high speed with minimal margin for error required exceptional skill. Ground crews, too, recall the RF-84F as a machine that demanded precision: a powerful yet sensitive jet with little room for maintenance error. The flyover of aircraft 3-38 / 7397 over this historic city thus represents a fusion of heritage and forward-facing military posture.

In conclusion, the flight of the RF-84F Thunderflash over Verona offers more than a visually arresting image; it provides a window into a transformative period in Italian military aviation. Through the convergence of photographic evidence, aircraft history, operational documentation, and pure photointerpretation, this article highlights the multifaceted role of the RF-84F in the Aeronautica Militare and cements its legacy as a symbol of Cold War vigilance and technological progress.

NOTES

1 https://archive.org/details/Annali_idro_VE-1956_P2 for 1956 and https://archive.org/details/Annali_idro_VE-1957_P2 for 1957.

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AUTHOR

Gianluca Cantoro (ISPC-CNR, Consiglio Nazionale delle Ricerche), gianluca.cantoro@cnr.it

Giampiero Federici (SARA Nistri), giampierofederici@yahoo.it

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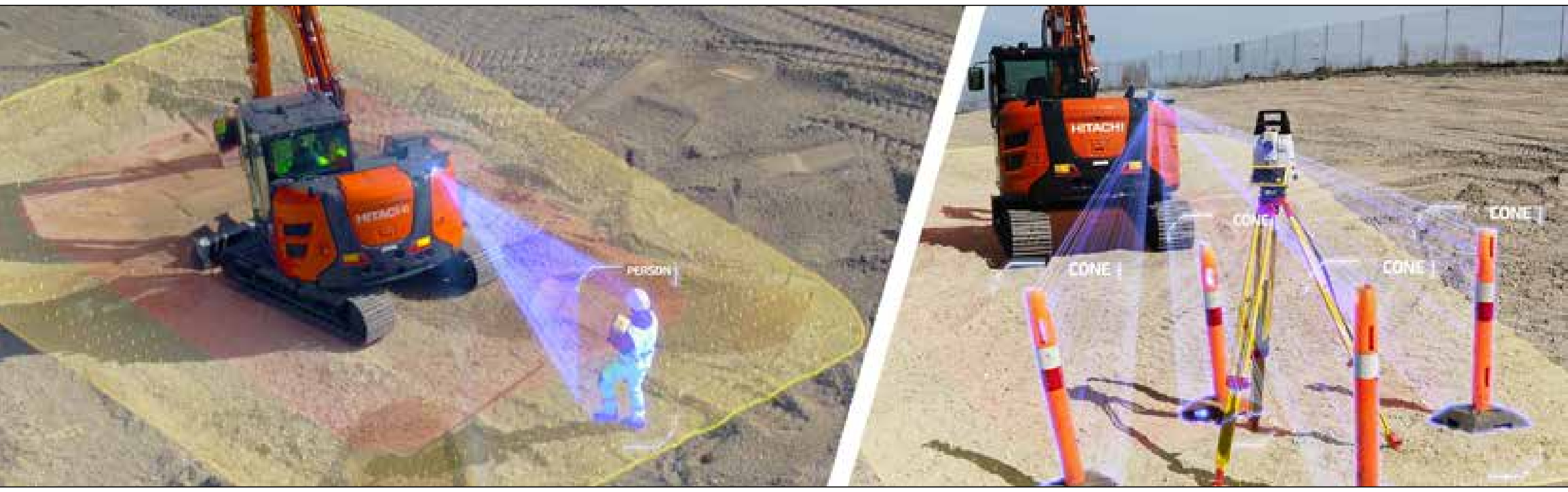

LEICA XSIGHT360 KEEPS CONSTRUCTION WORKERS SAFE THROUGH AI-POWERED VISUAL DETECTION

Leica Xsight360 uses onboard cameras and edge AI to instantly alert operators of hazards, surface operational insights, and deliver intelligent reports to drive long-term safety decision-making.

The system detects nearby people or objects and alerts the vehicle operator using sounds and visual cues. These indicate the location and proximity of the hazard so that the driver can take evasive action. Video and alert data is also transmitted to the cloud where agentic AI generates reports and recommendations for safety professionals.

Enhancing the operator's situational awareness

The system's visual AI models are specifically trained for heavy construction operations and continuously improve performance through industry-leading machine learning. The Leica CRS360 AI processor runs Presien's most advanced model to date – refined over 700,000 hours of real-world operation on construction sites – to deliver low-latency operator alerts with minimal false alarms.

Utilising proven AI detection technology, purpose-built for construction environments, Leica Xsight360 mitigates risks in real time by detecting hazards to keep people safe on site. The system supports up to six cameras, providing 360-degree coverage on any construction vehicle to detect people, other vehicles, and construction cones to reduce the likelihood of accidents.

Supporting safety professionals with actionable AI insights

As the onboard solution enhances operator situational awareness, data is also sent to the Leica Xsight360 cloud platform. This generates valuable insights that enable Occupational Health and Safety (OHS) managers to identify safety issues and opportunities for improvement. The vast amount of video input is interpreted by AI and transformed into safety indexes, dashboards, and reports within minutes. Users can quickly compare video footage to international, national, or site-specific safety policies, gaining an immediate overview of possible regulation violations, so they can make better and faster decisions.

The Leica Xsight360 solution minimises blind spots around machines and enables operators to stay alert with fewer job interruptions. In addition to increasing overall safety, the solution is easy to use and helps reduce incident-related project delays and costs.

"At Leica Geosystems, ensuring the safety of construction professionals is a top priority, especially as the industry advances towards automation. With our partner, we've developed an intelligent, adaptive system that enhances safety in the present with instant alerts and shapes future safety strategies through comprehensive reports," says Neil Williams, President of Leica Geosystems' Machine Control division.

"Partnering with a global innovator like Leica Geosystems marks a significant step in our mission to bring AI to every machine. We're proud to collaborate on a solution that empowers site teams and safety leaders to better protect people on the ground. Backed by years of industry experience, our tailored AI technology addresses the unique challenges of construction environments, delivering safety and productivity to the highest standards," says Mark Richards, Presien's Chief Executive Officer.

The Leica Xsight360 positions Hexagon's broad safety portfolio at the forefront of the industry. By combining Presien's leading physical AI expertise with Leica Geosystems' advanced precision technology and machine control experience, this powerful solution is uniquely positioned to transform safety standards in the heavy construction sector.

The product will initially be available in the United Kingdom, with plans to expand into other regions in the near future.

Learn more about the solution: https://leica-geosystems.com/products/machine-control-systems/awareness-solutions/leica-xsight360

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TOPCON AGRICULTURE ANNOUNCES ENHANCED BOOM HEIGHT CONTROL SOLUTION WITH UC7 PLUS

LIVERMORE, Calif. — July 14, 2025 — Topcon Agriculture has introduced the next generation of its boom height control technology for agricultural spraying applications with the launch of the UC7 Plus. Built on the foundation of Topcon's Norac boom height control technologies, the UC7 Plus allows farmers and crop service providers to further reduce inputs, improve crop performance, and reduce equipment maintenance costs with improved height and spray control capabilities.

Compatible with most self-propelled and pull-type sprayers, the new technology features new sensor technology that improves performance and reliability. This includes the new dynamic chassis sensor (DCS-1) that enhances the stability and response of the boom control system, and the latest MS-1 sensors with MAX Sense ultrasonic technology for improved performance in challenging terrain. These sensors are designed to withstand the rigors of the field with corrosion-resistant GF nylon housing, a protective transducer screen, and multi-axis vents.

"The combination of proven legacy solutions with the latest in precision technology serves up an extreme opportunity for lower operating and input costs, and lower equipment repair costs," said Nick Townsend, Topcon Agriculture vice president and segment leader for smart implements. "Spraying system advances increasingly provide farmers and service providers with an opportunity to achieve a greater return on investment on their equipment, either through upgrades or new investments. The UC7 Plus directly drives those savings," he said.

"These new capabilities also improve sustainability efforts in applying only the needed amount of spray, where it is needed, to achieve the best results — supporting compliance efforts, cost savings, and optimal crop performance."

In addition to practical cost savings and sustainability benefits, the technology also significantly reduces operator stress and fatigue through spraying automation: boom control automatically adjusts boom height to match the contours of the land. This reduces the operator's need to constantly monitor field terrain. The solution delivers varying levels of control to suit a wide range of applications, crops and operating styles, and it is compatible with a wide range of sprayers, making it ideal for incremental growth and upgrades on existing spraying systems.

Topcon testing data and research indicates the new UC7 Plus may improve overall spraying performance by 30 percent when taking into account all savings and efficiencies.

"We believe in accessibility to these technologies and the practical benefits they deliver to farms around the world — this is a simple and powerful example of intelligent technology evolution for the greater good of all farms and systems."

Additional information is available at topconpositioning.com/solutions/agriculture/crop-care.

About Topcon Positioning Systems

Topcon Positioning Systems is an industry-leading designer, manufacturer and distributor of precision measurement and workflow solutions for the global construction, geospatial and agriculture markets. Topcon Positioning Systems is headquartered in Livermore, California, U.S.

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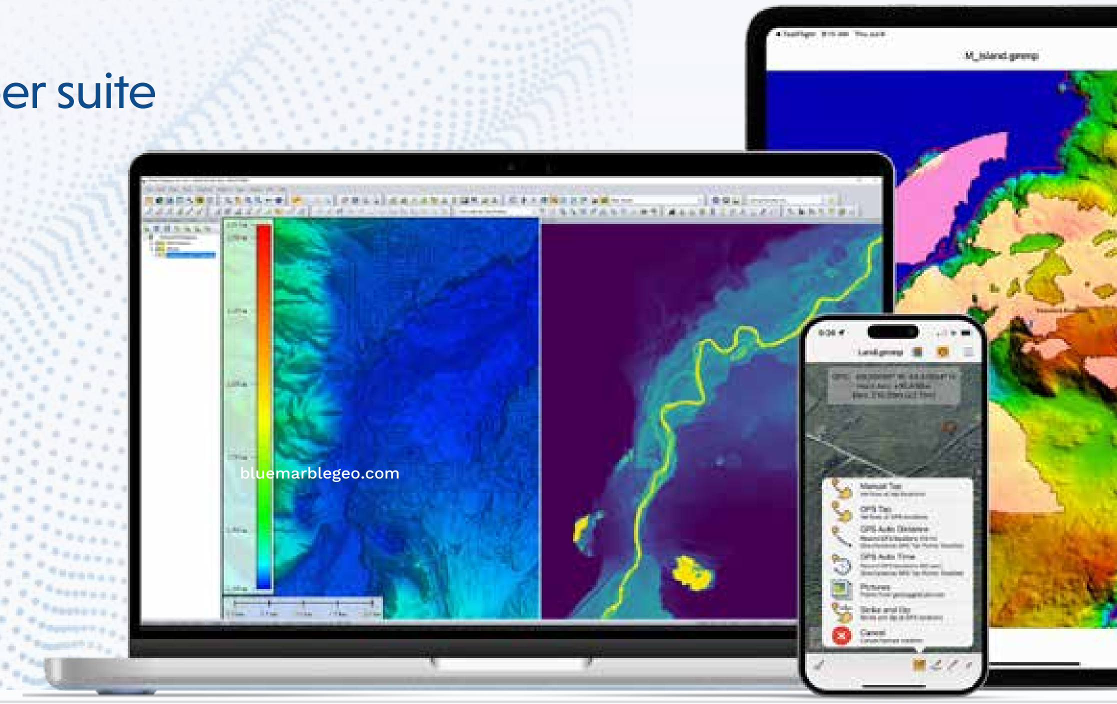

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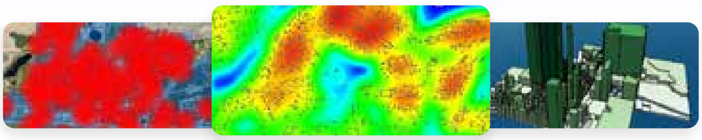

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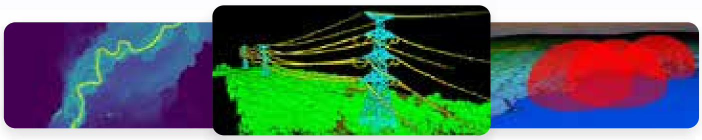

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