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#### ----- PERSONAL DETAILS AND TRAINING -----

Born December 16, 1954 in Saint Maur des Fosses (94) France, French Nationality.

Surveyor, Engineering Graduate of the Topography Dept. of the Ecole Spéciale des Travaux Publics (Public Works Engineering School, <http://www.estp.fr/en/> with specialisation in Topography), Paris, 1979.

#### ----- MAIN POSITIONS -----

Director and founder of the company TopoSat, a service company working in the field of topographic positioning by GPS since 1990. This structure is a legal French entity for self-employed worker (EURL).

Freelance surveyor with two employees (1986 - 1990).

Project manager for several firms of Chartered Surveyors (1982 - 1986).

In charge of the topography departments of overseas public works firms for civil engineering projects

- Earth dam, height 110 m (Algeria)
- Roads (Niger).

#### ----- MAIN REFERENCES IN GEODESY and GPS -----

Member of a working group of the CNIG (French National Council for Geographical Information) about CORS networks since 2002.

Ground Control Points for satellite images on more the 450 international airports in Africa, Asia, Europe, India, Japan, Mexico... for Airbus Defence and Space spread out on 93 countries and 4 continents (2013 - 2018).

Trainer for the use of GPS technology in several French speaking countries (Haiti National Geographic Institute and government bodies in 2017, Cameroun National Cadastre in 2011, MCA Benin in 2009, National Cartographic Institute of Gabon in 2008, National Direction of Senegal Cadastre in 2007, private GIS company of Gabon in 2004, private surveying company of Mauritania in 2001, National Company for Cameroun Electricity in 1999, National Direction of Moroccan Cadastre in 1995).

Consultant for Millennium Challenge Corporation (MCC) about implementation of a CORS network in Burkina Faso (2009-2014)

Consultant for national and European government bodies for the setting up of parcel measurements using the GPS system or by classical topography in the framework of Common Agricultural Policy survey programs (1993 - 2006).

Advice mission for the use of GPS in parcels measurements in Malta (2004), when this Island has reached the European community.

COR station implementation for GPS dealers in France and overseas.

Ground Control Points on the main European cities for several remote sensing companies (more than one hundred and fifty cities in Austria, Belgium, Czech Republic, France, Germany, Portugal, Spain, The Nederland's, Switzerland from 2000 to 2005).

Staking out, GPS survey and accuracy tests on international airports of Amsterdam, Bangkok, Brussels, Delhi, Geneva, Hong Kong, London (Heathrow, Gatwick), Paris (Roissy CDG and Orly), Vienna, Zurich for an American air traffic systems company ([www.sensis.com](http://www.sensis.com)).

Staking out of ILS and VOR on international airports in French Antilles, French Guyana, France Metropolitan, New Caledonia,

As founder of the company TopoSat, I am one of the oldest GPS surveyor and consultant in France, working in this technique since 1990 with a lot of references for private companies, chartered surveyors, national and international bodies.

----- MAIN REFERENCES IN AFRICA -----

- Setting and georeferencement of 2 GNSS CORS for Sugar company SUCAF-CI in Ivory coast (2019) including training.
- Consulting mission for the replacement of the historic geodetic system of the Comilog mining company in Gabon by a system calibrated on the new national geodetic system (projection GTM02) with the implementation of a new geodetic network.
- Ground Control point collection in Benin (2019) with the company Aerodata France in the frame of an Aerial Survey for cadastral maps (around thirty cities completing with the 2017 surveys)
- Consulting mission for the establishment of GNSS CORS for Compagnie Sucrière SUCAF Gabon in Gabon (2019).
- Ground Control point collection around international airports: Benin, Burkina Faso, Cape Verde, Comoros, Congo, Ivory Coast, Gambia, Ghana, Guinea, Mauritius, Madagascar, Mali, Mauritania, Morocco, Mayotte , Niger, La Réunion, Sao Tomé, Senegal, Sierra Leone, Sudan, Chad, Togo, Tunis (2013 - 2018)
- Ground Control point collection in Cameroon for Imao (<http://www.imao-fr.com/en/>) in the frame of an 800 km linear Aerial Lidar Survey (2017)
- Ground Control point collection in Benin for Aerodata France (<http://www.aerodata-france.com/>) in the frame of an Aerial Survey for cadastral maps of 33 cities (2017).
- Ground Control point collection in Guinea for Imao (<http://www.imao-fr.com/en/>) in the frame of an Aerial Lidar Survey (2017) for a Dam study (area 1885 km<sup>2</sup>)
- Setting and georeferencement of two GNSS CORS for Sugar company SARIS ( in Congo (2016)) and 2018
- Training courses for GNSS and conventional survey company SOSUCAM SOMDIAA in Cameroon (2015)
- Audit of a topographic service in Gabon for Eramet / Comilog - <http://www.eramet-comilog.com> – in 2013 and 2015
- Precision survey in Gabon for Imao (<http://www.imao-fr.com/en/>) in the frame of an Aerial Lidar Survey (2014) for 200 km<sup>2</sup> of forest for palm grove development study (200 km<sup>2</sup>).
- GCP survey for aerial images in 11 cities of Tchad for Aerodata France - <http://www.aerodata-france.com/> - in 2013
- Setting and georeferencement of three GNSS CORS for Sugar company SOSUCAM SOMDIAA in Cameroon (2013)
- Setting and georeferencement of three GNSS CORS for Sugar company CSS in Senegal (2012)
- Training courses for the use of Radiodetection cable locator for National Electricity Company of Ivory Coast in Abidjan (2011)
- Training courses for GNSS survey for National Land Survey of Cameroon (2011)
- Training courses for the use of Radiodetection cable locator for private company PARLYM of Ivory Coast in Abidjan (2011)
- Control grid in Congo for Geophenix (Groupe FIT, <http://www.fit-topo.fr/?lang=en> ) for Aerial Lidar Survey (2011)
- Control grid in Gabon for Geophenix (Groupe FIT, <http://www.fit-topo.fr/?lang=en> ) and Institut National de Cartographie du Gabon from NToum à Mitzic, Fougamou, Mouila et Mandji (several hundred kilometers) for Aerial Lidar Survey (2010)
- Control grid in Gabon for DTP Terrassements (Groupe Bouygues, <http://www.dtp-terrassement.com/en.html>) (construction NDjole to Médoulane, 2010).
- Consultant for the Millennium Challenge Corporation (MCC) for the establishment of a network of permanent GPS stations in Burkina Faso (2009-2012).
- Control Grid in Cameroon for Andrade Zagope (Road Garoua Boulai - Ngaoundéré, section 3 from M'bere to Ngaoundéré (2009)
- Control grid in Cameroon for DTP Terrassements company / Razel (Road Garoua Boulai - Ngaoundéré, section 2 from Nandeke to M'bere (2009)
- Training activities in the framework of the implementation of rural land plans and processing of “Permis d’Habiter” in “Titre Foncier” and assistance in drafting procedures and national standards for tolerances of surveying (Millennium Challenge Account - MCA Benin 2009)

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Ground Control Points and control grid (over a few hundred kilometers) in Sudan along the Nil River with IGN France International (2007, 2008, 2009).

Ground Control Points for satellite image calibration and Training courses for National Landing Survey in Dakar (Senegal, 2007).

Staking out and computation of GPS coordinates of the landing aid systems on Merowe airport (Sudan) in 2007.

Ground Control Points on several Moroccan cities (2006), in Alger (Algeria, 2005), Cairo, El Mansourah and Alexandria (Egypt, 2005).

Training Courses in GPS survey and assistance for setting-up of a GIS in Libreville (SODEP - Gabon, 2004)

DTM survey for electric buildings in Setif (Algeria, 2004).

Development of the Koumouna plain (Mali): perimeter limits and implementation of a geodetic network (Cira and Louis Berger, Office du Niger) in 1999.

Development of the M'Bewani plain (Mali): perimeter limits and implementation of a geodetic network (BRL Ingénierie and Hydropacte, Office du Niger) in 1998.

Power lines Ghazouët-Oran, Skikda-Annaba, Bejaïa-Jijel (Algeria): Ground Control Points and geodetic networks (GTM Herlick, 1991, 1992)

Chief of the topographic department for the construction of earth dam (110 m high) in Algeria - Al Moustakbal site - (Dragages et Travaux Publics, 1982).

Chief of the topographic department for the construction of an express way from Niamey (Niger) to the airport (Dragages et Travaux Publics, 1981).

#### ----- MAIN REFERENCES ELSEWHERE -----

Training activities in the framework of the implementation of a National GNSS Network in Haiti for Engineers and Technicians of CIAT, CNIGS, ONACA and private or public other entities (2017 and 2018)

GCP survey for satellite images on 450 airports spread over 90 countries and 4 continents in the frame of Airbus Defence and Space program (2013-2018). See [http://www.toposat.com/pag\\_archives\\_gcp/](http://www.toposat.com/pag_archives_gcp/)

Precision survey in Trinidad for Imao (<http://www.imao-fr.com/en/>) in the frame of an Aerial Lidar Survey (2012)

Survey of airport systems and accuracy control on International airports of Hong Kong (2005, 2007), New Delhi (India - 2006), Bangkok-Suvarnabhumi (Thailand - 2006) for Saab Sensis Corporation (US)

#### ----- MAIN REFERENCES IN DRONE MAPPING -----

Topographic map and DTM of a 45 km line for the study of a project to renew the drinking water supply pipeline in the town of Keetmanshoop in Namibia (Altereio, 2019).

Topographic map and DTM of Chantilly Golf course (2018)

NDVI orthophotos and DTM of agricultural plots in France for Airinov (2016)

RGB and NDVI orthophotos and DTM of agricultural plots in Cameroon for SOSUCAM (2015) from a sensor installed on a spreading plane

#### ----- CAREER PROGRESSION -----

Since October 1990

Founder and director of the Toposat Company. The company's business was initially oriented towards the study and computation of triangulations, traverses and ground control points for Chartered Surveyors, firms specialized in topography and the construction of power lines, government bodies and public-sector companies (Land Registry Office, SNCF - French Railways, local technical departments, etc.).

Since 1993, this activity has been maintained in parallel with topographic study, consultancy and training assignments and the recording of SIG data assisted by GPS. The company has been highly involved in the definition of tolerances and the

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setting-up of agricultural parcel surveys by land approach (CAP) in relation with the “Office National Interprofessionnel des Céréales” (National Office for Cereals) and the European Commission (Agricultural Division).

Since 2000, the company work for STNA (national body for aerial navigation) and some private companies in GPS measurements and staking out on airports.

#### May 1986 to October 1990

Freelance surveyor in Hyères (France), with two employees.

Main lines of work: medium-voltage power lines (longitudinal sections, 1 : 200 scale drawings), surveys for the technical services of the town of Hyères and public works firms. This activity continued until July 1992, in conjunction with TopoSat activities.

#### March 1984 to April 1986

Surveyor in FRANCE, salaried by several firms of Chartered Surveyors.

Technical director for marking-out operations, town planning projects, housing estate development (building permits, preliminary studies, detailed pilot studies, specifications, building-site supervision), plans, building work, etc.

#### October 1982 to March 1983

Surveyor in ALGERIA, Public Works Company

In charge of the topographic department for the construction of a 110 metre-high dam, comprising an embankment of 5 million m<sup>3</sup> of earth. This project necessitated digging several tunnels (for flood evacuation, draining, tapping, etc.), plus the erection of several technical buildings. Also in charge of liaison with the other departments involved in the project.

#### October 1981 to September 1982

Surveyor in NIGER, Public Works Company.

In charge of the topography teams for road works and drainage sites in and around Niamey.

#### April 1981 to September 1981

Trainee engineer at PARIS LA DEFENSE, Public Works Company.

#### September 1979 to December 1980

National Service in French Guiana.

Assigned to the design office of the local Guianese Facilities Planning Office. In charge of carrying out surveys, building forest inroads and preparing tenders for road network development.

#### April to July 1979

End of studies placement at the SNCF (French Railways), topography division. This placement involved the building works for the Paris-Lyon TGV (high-speed train). My role, along with the SNCF technical staff, was to carry out the main traverses along the line, plan layout (flats, infrastructures, rails, etc.), make clearance checks and inspect the works.

### ----- DIVERSE -----

#### Spoken languages

French, as mother language, English, Some Portuguese and Spanish

#### Presentations and Conferences

Practical use of the permanent GPS network (Forum GPS, National School of Geographic Sciences, Marne La Vallée, 2001).

General use of the GPS (Mauritania, 2001)

Practical use of the GPS, technical constraints and recommendations (European Commission, Ispra, 1996).

Technical approach to the modeling and estimation of surface errors during GPS measurements (European Commission, Ispra, 1996).

GPS: general principles and practical applications (Government Office for Land Conservation, Land Registry and Cartography, Morocco, 1995).

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Use of GPS systems for remote sensing and crop measurements (European Commission, Ispra, 1995).  
Tolerances applicable to surface measurements (European Commission, Brussels, 1994).  
Geodesy and GPS systems (European Commission, Ispra, 1994).  
Topographical techniques for parcel measurement (European Commission, Brussels, 1993).  
Cadastral triangulations by GPS (Land Registry Office, Clermont Ferrand, 1992).  
Longitudinal section testing by GPS (Sonelgaz, Algeria, 1992).  
Topographical positioning by GPS (Port of Rouen, 1991).

#### Study Reports

Study on the precision of stand-alone GPS in crops measurements (CNASEA, 2003)  
Study on the precision of crops measurements by aerial photos (European Commission, 2001).  
Study on the precision and handling of the various measuring techniques (Association for Technical Research for the Beet Industry, 1996).  
Detailed evaluation of the GPS application for the measurement of agricultural parcels (European Commission, 1996).  
Study on the precision and possible uses of GPS receivers (European Commission, 1995).  
Evaluation study on vineyards registers in France (European Commission, 1993 - partner with Sysame/Geosys)