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## Chapter 4

# Gagarin, a Special Relationship with France<sup>\*</sup>

Philippe Jung<sup>†</sup>

### Abstract

There has been for long a special relationship between France and Russia, beginning in the aerospace field with Robert Esnault-Pelterie, then Ary Sternfeld, and the unique *Normandie-Niemen* common fighter squadron based in the Soviet Union during World War II.

The historic flight of Gagarin thus had a huge impact in France, to such an extent that the French language was overnight modified, the term “cosmonaut” replacing “astronaut”—still to this day!

So it is no surprise that Gagarin made an extensive tour of France after his flight, when this, then young, author had the luck to see him in Metz in Lorraine. He also became a friend of Albert Ducrocq, the French engineer who was the greatest space popularizer ever. It was the occasion for him, a fan of cars, to be given a new MATRA *Djet* speed car, which became his preferred one.

It should not be forgotten that at the time of his flight, the corresponding launcher still was highly mysterious. It again befell upon France to be the place where the latter was finally revealed, in typical Soviet style, with a huge scale 1 mock-up during the 1967 Paris Air Show.

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<sup>\*</sup> Presented at the Forty-Fifth History Symposium of the International Academy of Astronautics, 3–7 October 2011, Cape Town, South Africa. Paper IAC-11-E4.1.04.

<sup>†</sup> AAAF (*Association Aéronautique & Astronautique de France*), 150 route de Pégomas, F-06130 Grasse, France.

A research in progress even seems to show that some details about the Zemiorka were known in France well before.

This paper will detail the impact of Gagarin's flight in France, as well as the many subsequent connections.

## Introduction

There has for long been a special relationship between Russia and France, dating from the early times of the Soviet Union, when one of the strongest, and biggest at national level, Communist Party in the West was the French one, closely aligned on Moscow. Also, as the mother of aviation, France saw its planes, generally the Voisin *Cellulaire* and the Blériot XI, make the first aircraft flight in many countries, as well as its aircraft be the first ones sold there (civil or military), or built under license, if not just copied right away!

## Early French Aeronautical Links

Thus the first flight in Russia, by the first aircraft sold there, was made on 25 July 1909 by Alexis Van den Schkrouff in the 26th Voisin *Cellulaire*\* built, sold to the Aero Club of Odessa. The first plane in the Russian Army was the Blériot XI, of Channel crossing fame. Many French aircraft were built under license in Russia: Caudron, Farman, Morane-Saulnier, Nieuport, REP and SPAD by several companies, Anatra, Duks, Lebedev, Maslennikov, Mosca, Shchetin, and such engineers as Polikarpov. This also applied to Gnome & Rhône, Hispano-Suiza and Renault engines, built by such companies as Duks and Tumanskii. But even before, Robert Esnault-Pelterie (REP) had been in Russia in March 1909, to give conferences, and possibly also exhibit, about his historic REP N° 2bis which had become on the previous 1st November 1908 the first aircraft using a stick for control—which he had duly patented. He was back, in St. Petersburg, from 14 February to 2 March 1912, leading to an agreement for the license manufacturing of his planes, the model(s) of which are not known.

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\* The *Cellulaire* was history's first plane built in series, from 1907, with 56 sold in the world.

## The First Space Talk by REP in St. Petersburg?

Barely arrived in the great northern city, REP gave on 16 February 1912, after famous engine builder Louis Seguin (*Gnome* motors), a conference when he is said to have spoken publicly for the first time in history about space travel, in the presence of Nikolai Rynin. This however is contested, and in the absence of any publication, cannot be confirmed. The talk for sure must have essentially been about his well-known aviation activities, while he probably only made passing references to space matters, maybe as a conclusion. It probably appeared so weird that it just was ignored—witness the necessity for him on his, this time confirmed, space talk the following November 1912 in Paris, when he had to hide this subject behind a very general title for it to be published in *Journal de Physique*.

## Sternfeld in France

The other way around, famous space pioneer Polish-born Ary Sternfeld (1905–1980) first came to France in 1924, where he brilliantly obtained a mechanical engineering degree in Nancy in 1927, ranked second. He then worked in *La Sorbonne* on a thesis on interplanetary travel, in spite of the opposition of his director. It finally was rejected in 1930, as being “too fantastic”! Back in Poland, he wrote in French in 1933 “*Initiation à la cosmonautique*,” which won him the *Prix d’encouragement* of the *Prix International d’Astronautique* 1933, created by REP.

A socialist idealist, he emigrated to the USSR on 14 June 1935, and worked in RNII from 1936 to 1937, when he miraculously escaped the Stalinian purges, being a “foreigner Jew.” After the Sputnik 1 launch, because of his long stay in France, he suddenly became well-known internationally, many believing he had been part of that. He thus started an author career (1 million copies of 85 books in 36 languages in 39 countries), but in Russia only Glushko later officially recognized him.

Other Russians went studying in France, notably in *Sup’Aéro*, the world’s first aeronautical engineering school, created in 1909: Meyer and Samuel Gurevich (graduation in 1913), general Alexandr Ponomareff (graduation in 1936). Mikhail Gurevich, of MiG fame, graduated from *Académie de l’Aéronautique* in Paris before 1923.

Ivan Makhonin on his side emigrated in France, where he flew the first variable geometry aircraft on 11 August 1931, the Makhonine 10, with extendible wings.

The other way around, it generally is not well-known that French engineers played an important role in the USSR, beginning in 1928, in the wake of the departure of the German Junkers team in 1928. The then still fledgling Soviet aeronautical industry, under the responsibility of state Aviatrust, arranged for the hiring in August 1928 of flying boat specialist Paul-Aimé Richard, from the Penhoët company in St Nazaire (today Airbus), together with André Laville, ex-Nieuport, and M. Augé. After working in GAZ-28/MOS VAO (State Aviation Factory/All Union Association for Experimental Naval Aircraft). Richard could organize his own design bureau in TsKB/OPO-4 (Central Design Bureau), with no less than Beriev (a reconnaissance flying boat study was the basis for his later famous MBR-2), Gurevich, Kamov, Korolev and Lavochkin! A TOM-1 twin-engine torpedo floatplane was test flown by Kamov in January 1931, but was not put into series production, as too complex and expensive. Richard went back to France in the end of 1931. Laville had on his side quickly left in August 1930, creating his own BNK (Bureau of New Design), which built one DI-4 fighter in 1933. When BNK folded, he went to NII GVF/GAZ-89 in Gorki. There he built the Goltsman ZIG-1/PS-89 twin-engine airliner for Aeroflot, before going back to France in January 1939.

### **Normandie-Niemen, a Unique Squadron**

The special relation between France and Russia took a new, exceptional, turn during the “Great Patriotic War,” when a group of French fighter pilots was sent by de Gaulle to the USSR to help the latter in its fight against Germany. They arrived in Ivanovo, 250 km northeast of Moscow, on 29 November 1942, to start training on Yak-1’s. Their first assignment, on 22 March 1943, was Polotniani-Zavod, 20 km north of Kaluga, Tsiolkovsky town! As they belonged to *Groupe de Chasse GC 3 Normandie*, the corresponding squadron was named on 21 July 1944 *Normandie-Niemen*, commemorating their contribution to the decisive battle which allowed the crossing of this river. No less than 97 pilots, 42 of which were killed in action, achieved 273 aerial victories. Marcel Albert was the N°2 French ace of the war, and many others went to a brilliant career afterwards: General Léon Cuffaut (director of *Aéro-Club de France*, the oldest one in the world), General Louis Delfino (*Inspecteur Général de l’Armée de l’Air*, director of *Ecole de l’Air*), Roland de la Poype (creator of the *brik* packing system for liquids and of *Marineland* in Antibes), Jean de Pange (member of *MIST Mission d’Information Scientifique et Technique*, collaborator of OFEMA *Office Français d’Exportation de Matériel Aéronautique*, administrator of several companies), Albert Mirlesse (head of MIST, which captured Willy Messerschmitt), Charles Monier (Dassault test pilot),

General Pierre Pouyade (*Inspecteur de la Chasse*, Air Attaché to the French President, deputy), André Moynet (State Secretary for Young People, test pilot of the *Caravelle*, Hurel-Dubois, *Super Broussard*, and creator of the MATRA-Moynet *Jupiter* push-pull business aircraft), General Joseph Risso (manager of the STRIDA military air traffic control system, chief of *Centre d'Opérations de la Défense Aérienne* in Taverny). The impact in Russia was huge, such that Staline gave France 40 Yak-3 fighters, which arrived in Le Bourget on 20 June 1945.

## The Modern Space Age

Franco-Soviet links continued when the world ushered into the space age with the launch of Sputnik 1. When COSPAR had its first assembly in Nice in January 1960, as a first East-West forum in this field, Academician Blagonravov made a stunning proposal in the journal *Le Monde*, offering its rockets and satellites to France! The country however had embarked from 1959 into a huge national, high-cost, nuclear program for the *Force de Dissuasion*, with the bomb, the carrying aircraft, as well as silo and submarine-launched missiles. Then, on 23 December 1960, a study proposed adding a third stage to the corresponding VE 231 *Saphir* missile testbed, thus creating the VE 331 *Diamant* space launcher.

## Gagarin Flight Impact in France

On 12 April 1961, Yuri Gagarin (9 March 1934 to 27 March 1968) became the first man in space. All French newspapers, like in the rest of the world, announced the flight on a full first page, with dithyrambic titles: "The century exploit" for *L'Aurore* and *Paris Jour*, "Historic" for *Le Figaro*, "Formidable" for *Libération*, "A Soviet opened the cosmos era for Man" in communist *L'Humanité*. The then powerful *Parti Communiste Français* sent a telegram to its Soviet alter ego, celebrating the "victory of the working class in power, liberated from the chains of capitalist exploitation and oppression." Historical leader Maurice Thorez spoke about "the country of the Soviets, the country of the building of Communism, the pioneers of the new world."



**Figure 4-1:** Academician Gagarin in the bus carrying him to Launch Pad 1 on 12 April 1961 (IAA-celebrating 50 years of excellence).

Gagarin's flight no doubt strengthened the case for a national space agency, being discussed at the time in France. The country had to have its place in this field. France's fierce independency was at stake, including the telecommunications field, already a concern for de Gaulle. The second agency in the world, CNES (*Centre National d'Etudes Spatiales*), thus was created on 1 March 1962.

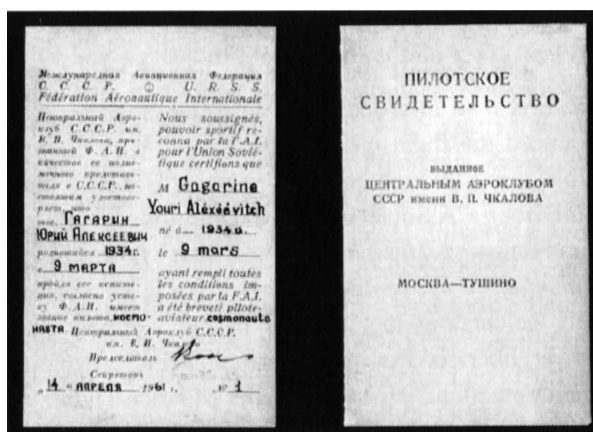


**Figure 4-2:** *L'Aurore*, *Le Parisien*, *Science* et *Vie* (Rombaldi).



**Figure 4-3:** *Aviation Magazine*, 1 May 1961.

**Figure 4-4:** Gagarin's Cosmonaute No. 1 certificate by FAI (*Fédération Aéronautique Internationale*), based in Paris.

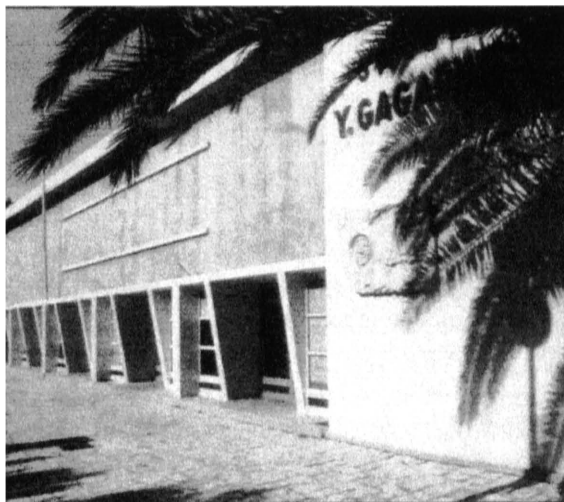


Numerous streets and places have received his name in France, more particularly in the communist-led cities, Gagarin himself inaugurating an avenue in 94400 Vitry-sur-Seine: Angers, Bègles, 93000 Bobigny, 62100 Calais, 52000 Chaumont, 92700 Colombes, 33185 Le Haillan, 59000 Lille, Lorient, 01100 Oyonnax, 97410 St Pierre, 18100 Vierzon, 94800 Villejuif, 59139 Wattignies.



There is also a roundabout in Malakoff and a Gagarin Park in Sartrouville. There are sport centers in 95100 Argenteuil, 62700 Calonne, 76800 St. Etienne du Rouvray, 78190 Trappes, as well as cultural centers in 93120 La Courneuve and 52770 Champigny-sur-Marne. Schools bear his name in 91700 St. Geneviève-des-Bois and Vaulx-en-Velin. Rooms also have been christened, like in 62210 Lens.

Amazingly, perhaps the first in the world (USSR included), Port-de-Bouc christened its Cultural and Sports Center *Yuri Gagarine* on 30 April 1961!



**Figure 4–5:** Gagarin Center in Port-de-Bouc (Jean-Paul Barrali collection).

### **French Language Modified!**

But the most stunning consequence of the flight of Gagarin, seemingly never appreciated by anybody, linguists included, was an instant change in the French language!

Up to 12 April 1961, everybody in France referred to space men as “astronauts.” This was simply due to the fact that before Gagarin, the only persons known to be training for space flight were the famous “Seven” of NASA, labeled there as astronauts.

This brings us back to REP... When he decided to create his prize, a dinner was organized on 26 December 1927 at the home of the mother of his friend banker André-Louis Hirsch with, among other famous names, astronomer Henri Chrétien, science-fiction writer Joseph-Henri Rosny Aîné (the president of *Académie Goncourt*), airborne radio pioneer General Ferrié,... The best avenues for promoting the rocket were discussed, and when the time to find a name for a

prize came, REP proposed *sidération*, as an analogue to “aviation.” It was not well received, nor *cosmonautique*. Having written a novel *Les astronautes* in 1925, Rosny proposed *astronautique*, which was immediately endorsed, then popularized by REP with the publication of a conference he gave on 8 June 1927. The *Prix International d’Astronautique* REP-Hirsch was accordingly created on 1 February 1928, and REP seminal theory, the most advanced in the world at the time, published in 1930 as *L’Astronautique*.

Actually, the first recorded use of “astronaut” goes back to Percy Greg’s science-fiction novel “Through the Zodiac” in 1880, in fact the name of the space vessel. Tsiolkovsky himself, like in 1932 with Tsander, used “astronautics” in his correspondence. Fittingly, it is Sternfeld who started using in 1933 the word “cosmonautics,” of Greek origins, because he thought the milieu had to be stressed, not the destination. However, in the fifties, astronautics spread in the Soviet Union, Sternfeld himself defining the seminal first, second and third astronomical speeds in 1955! Even Pravda, after the launch of Sputnik 2 in November 1957, was still referring to astronautics...

As a final blow against REP memory, no less than *L’Académie Française* decided in September 1969 to add in the dictionary the word *cosmonaute*, as the one navigating in the cosmic space, cosmos being defined as the universe...

A ridiculous postscript to this semantics debate in France saw CNES decide on 12 January 1973\* that, since the Americans had astronauts, and the Soviets cosmonauts, then the French should have *spationautes*!<sup>1</sup>

And now that the Chinese are up there, a Hong Kong journalist invented the word *taikonaut*, found everywhere, except ... in China, where they are known as *Yuhang Huan*...

### An Early Spy Leak in France?

Barely one week after Gagarin’s flight, an incredible theory was brought forward, at a time nobody could understand how the USSR was capable of launching such heavy payloads in space, bigger than the ones of hi-tech USA. There were for example weird suggestions about “secret propellant”...

Then, in the French auto magazine *L’Auto-Journal*, regularly publishing news on the spectacular new field of astronautics, a certain Constantin Brive wrote in the 20 April 1961 issue two full pages on an astounding explanation: the Soviets were launching their rockets, mounted on a tracked vehicle, taking its

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\* Decree on space words, as proposed by CNES and CILF (*Conseil International de la Langue Française*). Note the word already appeared in 1962.

speed by rushing down an icy valley slope, before climbing up the opposite slope, in other terms, what is called in France...Russian mountains!



**Figure 4–6:** Gagarin launch according to *L'Auto-Journal*, 20 April 1961!

This world exclusive was attributed to information related to congresses, tourists and western personnel having worked in the USSR—so probably the German Gottrup team of 1947/53.<sup>2</sup> At the end of the article however, Schultz, the so-called “father of the V 1,” is identified as having gone to Russia.\* The base was given as the Altaï Mountains in Mongolia, while two other bases were mentioned as possible (one too much with only Kapustin Yar and Tyuratam at the time!).

The purported sequence, amid various mistakes and incoherences, was mind boggling. The 250 t sled, of 60 m length, had 24 sets of double wheels of 1.5 m diameter on each side, as well as central wheels (a mix-up with the 3-rails track of the SE 1910 sled in Istres?)—the drawing only shows two rails of about 10 m width... Lateral strakes were used for adherence of the sled. From 150 m height, the latter started going down along a 45° slope. When reaching 20 km/h, electrical motors were connected. As speed in the valley reached 600 km/h (the SE 1910 world speed record in 1952 was 328 km/h, and the French BB and CC locomotives reached 331 km/h in 1955...), two kilometers away from the opposite slope, two rocket engines (interestingly, with 2 nozzles each) at the back of the sled were automatically ignited. Climbing up a 45° slope, the sled now switched to skids, reaching 3,000 km/h before separation of the rocket took place at 2,000 m height, after a 20 km run!

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\* He is unknown. The fathers of the V 1 are Willy Fiedler and Robert Lusser, while August Shulze was a member of the Von Braun team.

Noteworthy, the rocket, with 8 nozzles for the first stage (actually 20 for the R-7), was conical, with an estimated weight of 150 t (273 t for the Sputnik 1 launch, 290 t for Vostok).

Now that we know the R-7 is transported horizontally on a rail carriage (but with  $2+1+2+4+2+4=15$  wheels on each side), one wonders whether some spy witnessed this activity, or knew about it, and informed France. But the wrong conclusion was then taken!

### Gagarin in France in 1963

For some reason, France was not one of the first countries to be visited by Gagarin, who travelled in 1961 to Brazil, Canada, Ceylon, Cuba, Czechoslovakia, India, Finland, Hungary, Iceland and the UK (in July). Nor incidentally in the other free world country with a strong communist party, Italy, also with an aeronautical industry and fledgling rocket activities. But he later came to France three times.

He landed in Le Bourget on Friday 27 September 1963, in an Aeroflot Tu-104, accompanied by then unknown General Kamanin, to participate to the 14th IAF in Paris, in the UNESCO headquarters (25 September–1 October): a special meeting had been organized in the evening on the 28th by the Bioastronautics Committee.\* Before, he could talk with famous space popularizer/scientist Albert Ducrocq, who was impressed by his simplicity and his smile. He announced future multi-seat spacecraft, with scientists, as well as rendezvous to assemble a space station.

In the presence of a huge crowd, he also received on 1 October in Hotel Lutetia the 5th *Prix International Galabert d'astronautique*, of 5,000 F. The latter had been created in 1958 by industrialist Henri Galabert, and his friend Ducrocq, to encourage progress in propulsion and guidance of space vehicles. It had been previously awarded to such luminaries as Ernest Stuhlinger, Hermann Oberth, then in 1961 to Jean-Emile Charon and Jacques Bergier (alias Mik Ezdanitoff in Hergé's "Flight 714 for Sydney"), and in 1962 to Pierre Blanc, Lucien Gérardin, Siegfried Klein and Julien Martelli. In March 1963, it was awarded to Yuri Gagarin, John Glenn (absent), Leonid Sedov, Ary Sternfeld, Alla Masevich, Jean-Jacques Barré and *Club Spatial International du Plessis-Robinson*. It later was awarded in 1973 to Carl Sagan and Audouin Dollfus.†

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\* He was elected to the IAA (International Academy of Astronautics) in 1964, and also became one of its Honorary Members.

† Academician in 1961, and IAA Trustee 1975–1981.

Gagarin was welcomed in the *Sénat*, and visited Lenine's house, *Arc de Triomphe* and its Unknown Soldier tomb. He also was interviewed by the main French pictorial weekly, *Paris Match*.

He then travelled on Sunday to visit Rouen and its cathedral, the big Tan-carville bridge, before being received in Deauville, the mayor of which was Gaullist Michel d'Ornano.



**Figure 4-7:** Gagarin and the Tu-104 in Le Bourget (*Air & Cosmos*, 7 October 1963).



**Figure 4-9:** Gagarin with Ducrocq (*Air & Cosmos*, 7 October 1963).



**Figure 4-8:** Gagarin speaking during the Paris IAF; 5th right is IAF President E. Brun. (IAF—The First 50 years).



**Figure 4-10:** Gagarin in Paris (*Air & Cosmos*, 7 October 1963).



**Figure 4-11 (left):** Gagarin speaking with *Aviation Magazine* space journalist Georges Sourine (*Aviation Magazine*, 15 October 1963).



**Figure 4-12 (right):** Gagarin on the balcony in Deauville, near the flag hamp (*Aviation Magazine*, 15 October 1963).

## Second Trip to France in 1965

Gagarin came a second time to France, this time on the occasion of the 26th Paris Air Show (11 to 21 June), when the USSR became for the first time an official participant (besides small participations in the 1934 and 1936 shows). We now know Yuri had been removed from the cosmonaut team since June 1964, to preserve a “national hero.” He landed with Aeroflot Tu-134 SSSR-45076. In addition to the spectacular presentation of the giant An-22 cargo plane and Mi-10 helicopter crane, the Vostok was shown publicly for the first time, by Gagarin himself (following its display in Moscow on 29 April, and the first pictures in Flight of 6 May).<sup>\*</sup> From that time, the Paris Air Show became the major showcase for the USSR, which every time reserved for its French friends major revelations, both aeronautical and astronomical ones, the Soviet space pavilion for long regularly being one the major stars of the show. On the 12th, he flew on the MATRA/Moyonet M360-4 *Jupiter* push-pull prototype F-WLKE.

The US reply came with Vice-President Humphrey and the Gemini 4 astronauts, McDivitt and White, who landed in Le Bourget on 18 June with Air Force One. Gagarin met them, in the presence of French Prime Minister Pompidou.

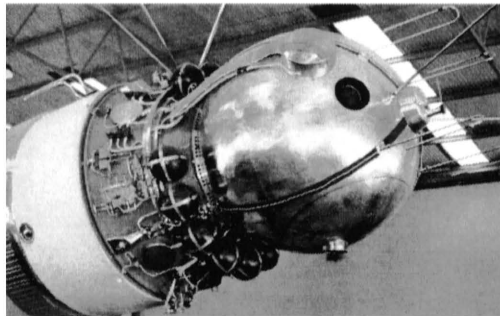
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<sup>\*</sup> *Space Chronicle* 2009/2.

While he was having a lunch with Embassy persons in the Show management restaurant, Gagarin was approached by Jean Tabourin, the nephew of MATRA's founder Marcel Chassagny (also the president of the Show), who proposed him visiting his company stand, as MATRA was working on A-1, the forthcoming first French satellite (launched on 26 November 1965, making France the third space power). This resulted in an appointment in the Soviet Pavilion with Jean-Luc Lagardère, MATRA director, the latter giving the cosmonaut a ride in the new company sports car, the MATRA-Bonnet Djet V. Audacious Lagardère even offered one to Gagarin. As the An-22 was not available for transportation, Tabourin and mechanics Bernard Castaings left Paris with the car on 26 July, speeding along the European highways at 175 km/h to reach Moscow on the 28th! There it was delivered in the French Embassy by Roger Créange, MATRA-Sport director. An article appeared in the weekly *Paris Match*. The coup was brilliant, with sales of the car jumping from 28 in 1964 to 365 in 1965. Gagarin, whose Djet was his favorite car, became a friend of Tabourin.



**Figure 4-13:** Gagarin with the Tu-134 crew in Le Bourget in 1965 (*Air & Cosmos*, 19 June 1965).



**Figure 4-14:** The Vostok revealed in the 1965 Paris Air Show (Rombaldi).



**Figure 4-15:** Gagarin's MATRA *Djet V*. Left to right: Castaings, Titov, Créange, Gagarin, Tabourin (MATRA).

On the 19th, Gagarin visited a Renault factory, a communist stronghold.

He then went to Vichy, on the occasion of the 2nd *Festival du Film Aéronautique et Spatial* (21–27 June), in company of Komarov: “Voskhod in the cosmos” got the special Maurice Noguès prize. Noteworthy, Nikolaev and Tereshkova had been in Paris on the previous 13 May 1965 to receive the *Prix Galabert* (together with William Pickering), and also went to Nîmes and Menton.



**Figure 4-16:** Gagarin and Komarov in the Vichy City Hall (Aviation Magazine, 15 July 1965).



On 25 June he visited the Toulouse-St Martin factory of Sud Aviation, and its *Caravelle* manufacturing line. He also was shown Concorde test elements in nearby EAT (*Etablissement Aéronautique de Toulouse*, now CEAT). He then was flown back to Le Bourget in the *Caravelle* 10B3 prototype F-BLKJ by famous test pilots Jacques Guignard, Leopold Galy and flight mechanics Michel Rétif.



**Figure 4-17:** Left to right, Gagarin, Guignard, Galy, Rétif in *Caravelle* 10B3 n° 169 (Sud Aviation).

### **France, a Privileged Nation, de Gaulle in Baïkonur in 1966**

During the Show, Jacques Marmain who had been for years a noted Soviet specialist in *Aviation Magazine*, established such good relations that a historic first visit was organized in February 1966, for him and three other collaborating magazines: *Alata* (Italy), *Aviation et Astronautique* (Belgium) and *Wehr und Wirtschaft* (Germany). Antonov, Ilyushin, and Ivchenko were visited, and two round tables organized with among others, the Aeroflot and TsIAM directors, and no less than Antonov (an *AviMag* reader), Ilyushin, Kamov, Mil, Tupolev and Yakovlev themselves! While only aeronautical matters were addressed, they represented yet a further spectacular step for coming events.

On 27 June 1966, another astounding event indeed took place, when General de Gaulle himself became the first Westerner to visit “Baïkonur” and even see—albeit from far away—the launch of the Cosmos 122 weather satellite by a secret rocket (later known to be a R-7). The trip was concluded by the historic first East/West space agreement on 30 June.

France had quite naturally began cooperating with the USA, with a first agreement between *Comité des Recherches Spatiales* and NASA. This continued as soon as CNES was created in 1962, with a first official agreement signed on 18 February 1963. Things obviously had been going slower with the USSR. Thus de Gaulle seminal trip had been prepared from 1964, when the Science, Atomic and Space Minister, Gaston Palewski, went to the Science Academy in Moscow. Foreign Minister Andrei Gromyko was received by de Gaulle on 27 April 1965. But the decisive turn no doubt was when France decided on 7 March 1966 to leave the integrated command of NATO. A trip in Moscow in April 1966 by Jean Coulomb, CNES president, and Jacques Blamont, his scientific and technical director, allowed finalizing the details of the seminal visit.

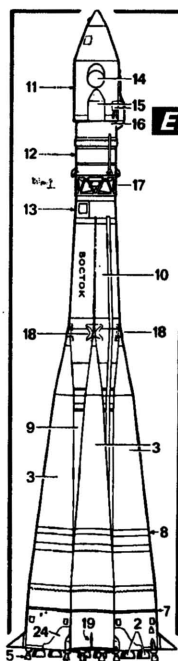
### **The Vostok Rocket Revealed in France**

Certainly as a consequence, one year later, the 27th Paris Air Show (26 May to 4 June 1967) was yet the stage for another spectacular revelation, again reserved by the Soviet Union to France: a full scale 1 mock-up of the secret “Vostok” rocket! A first fuzzy glimpse of the rocket outline had indeed appeared on a Voskhod 2 launch film, as early as in August 1965, correctly labeled by Aviation Week, but only mentioned by Flight as an unidentified launcher—still nothing on the Vostok launcher.<sup>3</sup> Now a stunned world was able to see for real a rocket of extraordinary shape, with an unique forest of nozzles. Who would then had thought cosmonauts would still be shuttling on it to the ISS in 2011!

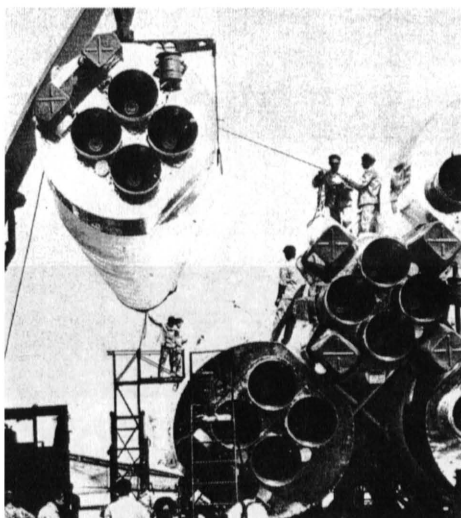
One of the main contributors was ever active Jacques Marmain, who asked in January 1967 the related ministries that USSR again participate to the coming Show, and spare for Paris a few *premières* in advance of the big forthcoming 50th anniversary of the October Revolution. He was astounded to find that nearly the full list provided by *Aviation Magazine* was accordingly presented in the Soviet pavilion: Cosmos, Proton, Elektron, Molnya, Luna, Venera satellites, a then incredible collection! Plus the Vostok star in front of the main hall...

The latter had been sent by boat to Le Havre, with the hardware disembarked in Rouen (a dozen years later, Ariane launchers would start going the other way from Les Mureaux). Everything was then trucked to Le Bourget, under wraps. Only on 11 May could a first good view of the historical rocket be ob-

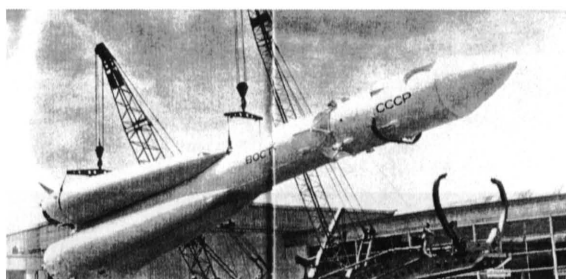
tained, actually a beautiful and very detailed scale one model. This allowed *Aviation Magazine*, with the help of its Moscow contacts, to rush for publication in its n° 467 of 15 May, well before the show opening, the world's first 2-view drawing of the Vostok rocket, together with its main characteristics (but neither motor nor propellant details). This was before the mounting on the 20th of the assembled launcher on its rotating cradle.



**Figure 4-18 (left):** The world's first Vostok rocket drawing (*Aviation Magazine*, 15 May 1967).



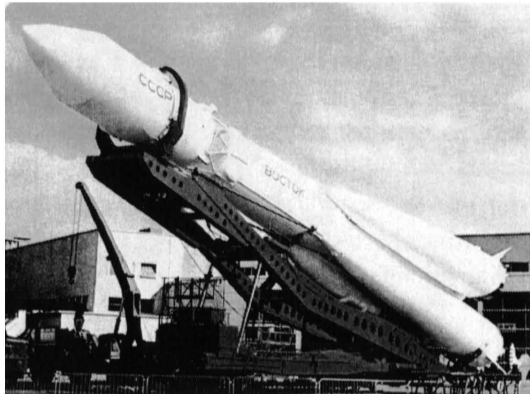
**Figure 4-19 (right):** Mounting of the fourth lateral booster (*Aviation Magazine*, 1 June 1967).



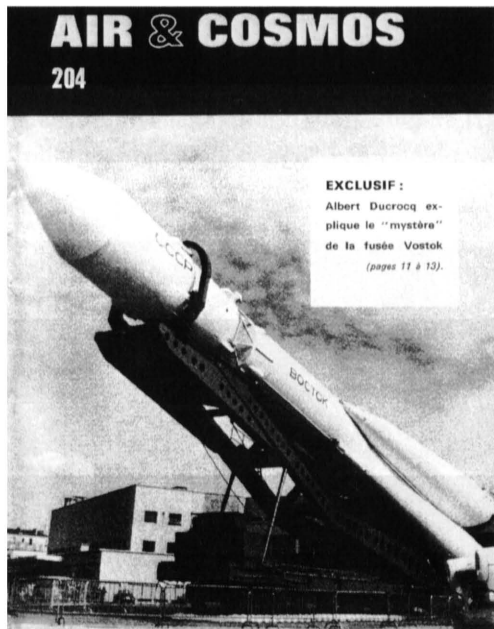
**Figure 4-20:** The Vostok rocket being mounted on its erection device on 20 May. (*Aviation Magazine*, 1 June 1967).

During the show, the propellant was announced to be kerosene/LOX, and the thrust to be 102 t. In *Air & Cosmos* 17 June, Ducrocq explained that the astonishing choice of a 4-chamber/nozzle configuration for the RD-107 and RD-

108 engines allowed an expansion ratio of 150, leading to an extraordinary exhaust velocity of 3,100 m/s, instead of the usual one of 2,700 m/s. Each, small, chamber only had to withstand about 600 t on its wall, whereas a bigger single one would have had to bear about 1,500 t. An added advantage was at the level of cooling, the total area available for kerosene circulation cooling being 60% bigger than the one of a single chamber, allowing about 3,200°C at the throat.



**Figure 4-21:** The Vostok rocket revealed to the world at the Paris Air Show in May 1967 (Rombaldi).



**Figure 4-22:** *Air & Cosmos*, 17 June 1967.

### Third Trip to France in 1967

Gagarin came a third time to France later in the year of 1967, with Sergei Pavlov (Komsomol Secretary), for a big tour in the frame of the commemorations of the 1917 Revolution, at the initiative of the French Young Communists. After arriving in Paris on 23 September, he took the special *Phocéén* train to Marseille: he had begun training again in April 1966 as a reserve for Soyuz 1, but in the wake of the April 1967 catastrophe, he only had been allowed in August to fly with an instructor, and required to minimize flying in general. He was welcomed on 25 September by Georges Lazzarino, the communist deputy of *Bouches-du-Rhône*. He went to famous *Canebière* and to the *Fédération Communiste* siege. He then travelled to the red cities of *Etang de Berre*, Martigues and Port-de-Bouc. He stayed briefly in the former, being presented the stele commemorating the fist seaplane flight there by Henri Fabre in 1910, already visited by Leonov in April 1966. In Port-de-Bouc, the city meeting room was christened in his name. He then planted a Peace Pine in a garden near the *Véran Guigue* House. Later, on 15 April 1973, a sculpture with his portrait was inaugurated on the Sports Center wall.



**Figure 4-23:** Gagarin at the Fabre stele in Martigues (Jean-Paul Barrali collection).

The next step was in Aubagne on the 26th, where he visited a technical school, writing on the blackboard the drag equation. Back in Marseille, he gave autographs in the Paul Eluard library. He also practiced water skiing. He visited Le Castellet, the islands of Bendor and Embiez. He again took the train to reach Nîmes and its Roman arenas, and Alès. In St Gilles, he visited a vineyard, and a special brand was given his name.



**Figure 4-24:** Gagarin in Port-de-Bouc (Jean-Paul Barrali collection).



**Figure 4-25:** Gagarin stele in Port-de-Bouc Cultural and Sports Center (Jean-Paul Barrali collection).

He then went up in northeastern France, arriving in the Metz train station on 30 September 1967, when this (then young) author managed to see him at close range.

At the same moment, *Aviation Magazine* made yet another coup with its 1 October 1967 issue, now with the first, detailed, cutaway drawing of the Vostok rocket!

But another—now fascinating—aspect, was that the journal thought they had a further scoop in the shape of the joined exclusive picture of the historical Sputnik 1 rocket, a classical two-stage rocket. At the time the USSR had told the Vostok rocket had been first launched in 1960 (it actually corresponded to Sputnik 4, the first use with a Vostok cabin). Thus everybody was wondering about the “small” rocket used for Sputnik 1 to 3—nobody could even think about the giant rocket already being available in 1957!\*



Figure 4-26: Gagarin in front of the Metz train station (P. Jung).

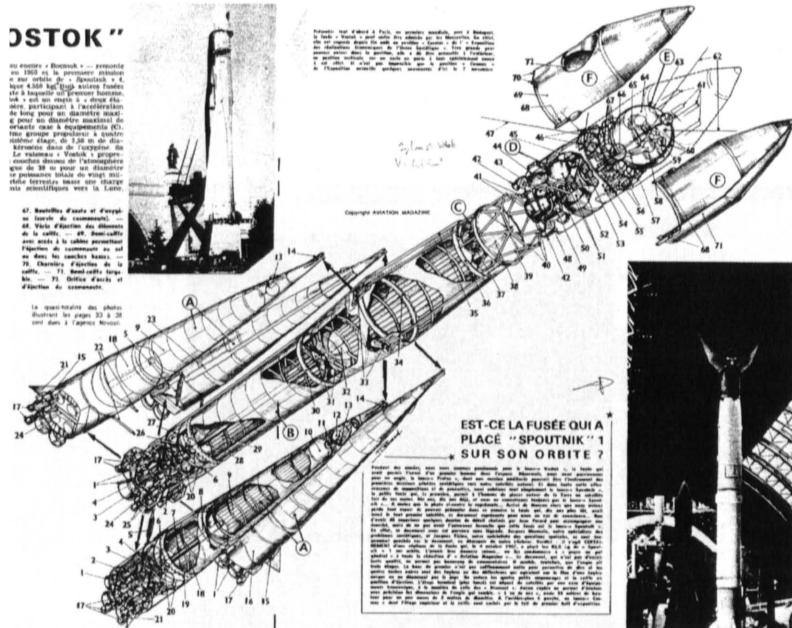
Then, on 2 October, Marmain and space journalist Jacques Tiziou were able to talk with Gagarin, now back in Paris<sup>†</sup>, for the first time without guards: the press officer and the scientific attaché in the USSR embassy were there, as well as a French journalist from *Paris Presse* as an interpreter. When shown the cutaway, spacefarer N°1, for the first time, marked a real surprise. He found it so good that he autographed it. The next question of course was about this small rocket below the drawing, that he instantly confirmed to have been the Sputnik 1 launcher—we now know it just was an R-5! While during the interview he kept, as usual, artfully sidestepping all detailed questions, did he really so blatantly lied on this point?

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\* It is now known the first 8K72 “Vostok” (n° B1-3) already had been launched on 23 September 1958 with the failed Luna E-1 n° 1 probe—nobody then knew about the many Soviet failures of the early years...

† Gagarin also travelled to such French towns as Puteaux, Ivry, Nanterre and Versailles in the Paris area, as well as Le Havre, Gonfreville, Clermont-Ferrand and St. Etienne.

Was it a translation mistake, or an interpretation by those who were so sure of their guess? Closely analyzing the picture, it shows a two petal-shroud revealing a sphere as a payload: could it then correspond to a suborbital test for Sputnik 1?



**Figure 4-27:** The first Vostok cutaway (*Aviation Magazine*, 1 October 1967), and the autograph: "For a very good drawing—Gagarin 2.10.67"

Alas, six months later, Gagarin was tragically killed on 27 March 1968 in an old MiG-15UTI jet trainer, a shock all over the world.

## The Legacy: First East/West Cooperation in Space in 1970

In the wake of de Gaulle trip, France again had in the meantime written history on 9 and 10 October 1967, when for the first time Soviet MR-12/D75M sounding rockets were launched from Heyss Island, with a Western aeronomy payload, a sodium cloud release, a technique inaugurated by Blamont. The reverse took place two years later, with four Sud Aviation Dragon IIB rockets (D256 to D259) launched on 6 and 7 February 1969 from *Centre d'Essais des Landes*, with mass spectrometers from the Soviet Hydrometeorology Service (experiment FU180).

France then clearly was the main point of contact between East and West. But even more incredible things were to happen...

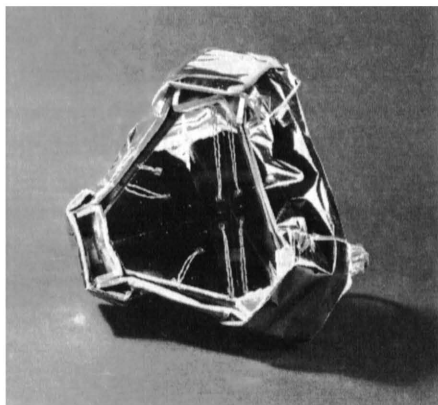


On 17 November 1970, Luna 17 (E-8 n° 203) softly landed, deployed an inclined ramp, thanks to which the first Moon car, *Lunokhod 1*, remotely driven from Earth, went down and started rolling on our satellite surface. In front of it, there was a laser reflector panel, TL2 (*Télémétrie Laser Terre Lune*), built by Sud Aviation in Cannes. Only then the French discovered the support vehicle... The second one after Apollo 11, this panel was equipped with 14 cube corners, allowing more accurate measurements. The rover however was quickly lost by the ground, until much later, it was found by Lunar Reconnaissance Orbiter in March 2010, and has been used since 22 April 2010, even giving better results than the second one on *Lunokhod 2*.

When this feat was commemorated on 26 November 2010, an even more startling story was revealed. In full Cold War, a Soviet Academy of Sciences and CNES delegation of half a dozen persons visited on 13 October 1971 the Cannes factory, then busy with the highly secret *Force de Dissuasion* missiles, for a two weeks test of their own, back-up, single reflector! It was planned to fly on *Lunokhod 2*, eventually launched on 8 January 1973. The reason was that the USSR had no thermal vacuum optical test chamber comparable to the French one, for which an equivalent would only appear on the market 20 years later. It is during a conversation between the now retired engineer in charge, Guy Cerutti-Maori and this stunned and suspicious author, that this totally unknown fact was uncovered—later duly confirmed by the discovery of the corresponding pictures in the company archives. It turned out that, when cooperating, the prudent Soviets always built their own hardware, just in case the foreign one failed. Actually, with the French panel better than the Soviet one, the former one flew on *Lunokhod 2*...



**Figure 4-28:** A Soviet delegation in the Cannes factory on 13 October 1971, to prepare laser reflector testing! (Aerospatiale).



**Figure 4-29:** The Soviet Lunokhod back-up laser reflector revealed, for testing in Cannes (Aerospatiale).

Soon after the 29th Paris Air Show (27 May–6 June 1971), when the USSR again had starred with the Soyuz, Lunokhod and the R-7 launch pad mock-up, six *Armée de l’Air* Mirage IIIC\* of EC 2/10 *Seine* in Creil (today the base of the Hélios centre), made the incredible first trip of western fighters since World War II, to Moscow-Domodedovo, from 21 to 25 June 1971, in the frame of *Operation Boréal*. They were accompanied by the presidential *Caravelle* with General Gauthier, the chief of *Armée de l’Air*, who had been invited by his counterpart, Marshall Koutakhov, and two support *Transall*. This was a consequence of contacts which had started between the two nations in 1969, Admiral Patou going East, followed by General Ivanoski, in charge of the Moscow Region, to France in June 1971.

Barely three months later, on 6–11 September 1971, the reverse first took place, with the venue of Marshall Koutakhov with six of the latest “enemy” MiG-21MF Fishbed-J† version and two An-12 in Reims, home of EC 2/30 *Normandie-Niemen*!

The unique “*Neu-Neu*” contribution never was forgotten in the USSR. This author participated in July 2003 to a commemoration organized in Moscow for General de Gaulle, when the French commander of the *Neu-Neu* led a ceremony in the House of the squadron, near the Kremlin, while traffic on the peripheral boulevard was blocked! In the Army Museum on the Red Square, this author had brought full-scale test models of the laser panel and of the TVS, the cameras also built in Cannes, which took the first picture of a comet, the Halley one. Although few fighter squadrons now remain in France, the third Rafale squadron, EC 2/30, will be the keeper of the *Neu-Neu* tradition in the end of 2011. Its correspondent in Russia is the 11th Army’s 18 ShAP in Galenki, equipped with Su-25’s.

Today no less than 144 schools in Russia bear the name of *Normandie-Niemen*...

A long list of world *premières* in space followed:

- 26 January 1975 ARAKS, unique artificial aurora in Archangelsk by a Sud Aviation Eridan launched from Kerguelen in the Antarctica
- 4 April 1972 SRET I, the first Western satellite launched by a Soviet rocket (Soyuz)
- 24 June 1982 Jean-Loup Chrétien, first Western cosmonaut in space (Soyuz T-6)
- 29 June 1982 Cosmos 1383/Tsikada, the first SARSAT space rescue system launch

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\* No. 25 F-UIRB, 30 F-UIRE, 35 F-UIRL, 48, 62 and another one.

† Including 26, 32 as well as Blue 27, 29, 30.

- 3 March 1986 Vega 1's TVS camera, the first comet pictures (Halley)
- 26 November 1988 Chrétien, first Western cosmonaut double flight, third country's EVA (Soyuz TM-7)
- 4 October 1997 NPO-PM & Aerospatiale, first East-West satellite company agreement (telecom), on the 40th anniversary of Sputnik 1
- 9 February 1999 first launch of Franco-Russian company Starsem (4 Globalstar by Soyuz ST1)
- 20 February 1999 Jean-Pierre Haigneré, Western astronaut duration record, of 189 days (Soyuz TM-29)
- 17 August 1996 and 21 October 2001 Claudie Haigneré, first Western woman to fly twice (Soyuz TM-24 & 33).

### **Conclusion**

Yuri Gagarin made three trips to France, the last one only 6 months before his untimely death. They strengthened the special relationship between France and Russia, starting with the French aviation pioneers, REP making a transition with *astronautique*, then furthered by the *Normandie-Niemen* and de Gaulle. And now, Gagarin's incredible Vostok rocket, revealed in Paris in 1967, has found a third home, the first outside its country, in French Guyana, with a launch planned on 20 October 2011 with the first two Galileosat's, in its Soyuz guise.

### **Acknowledgements**

The author wishes to thank Jean-Paul Barrali and Jacqueline Carpine-Lancre.

### **Note**

There was a French song by Claude Rigui about an orbital rendezvous with Gagarin.

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- 3 JBIS *Space Chronicle* 2010/2.