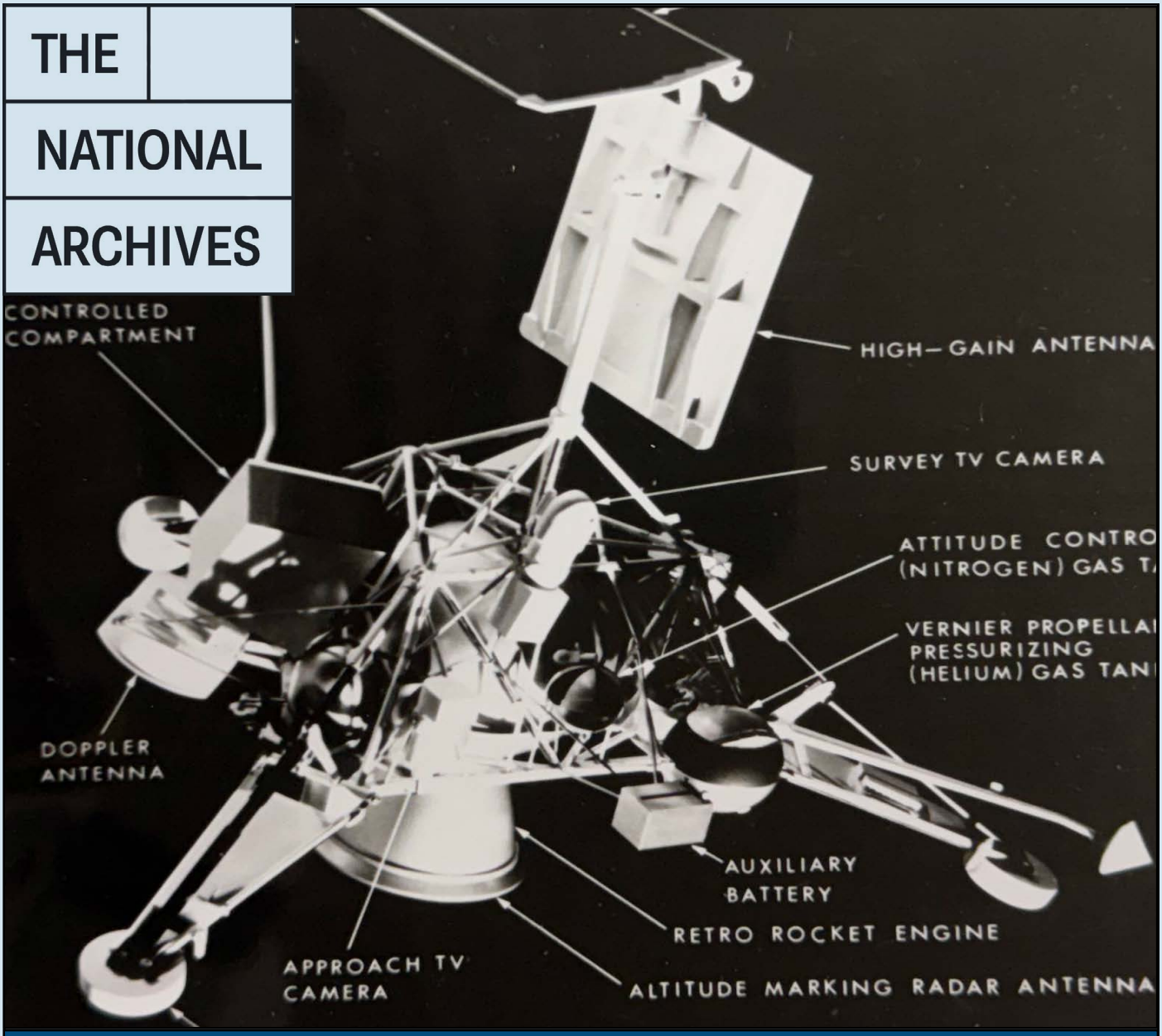
THE NATIONAL ARCHIVES

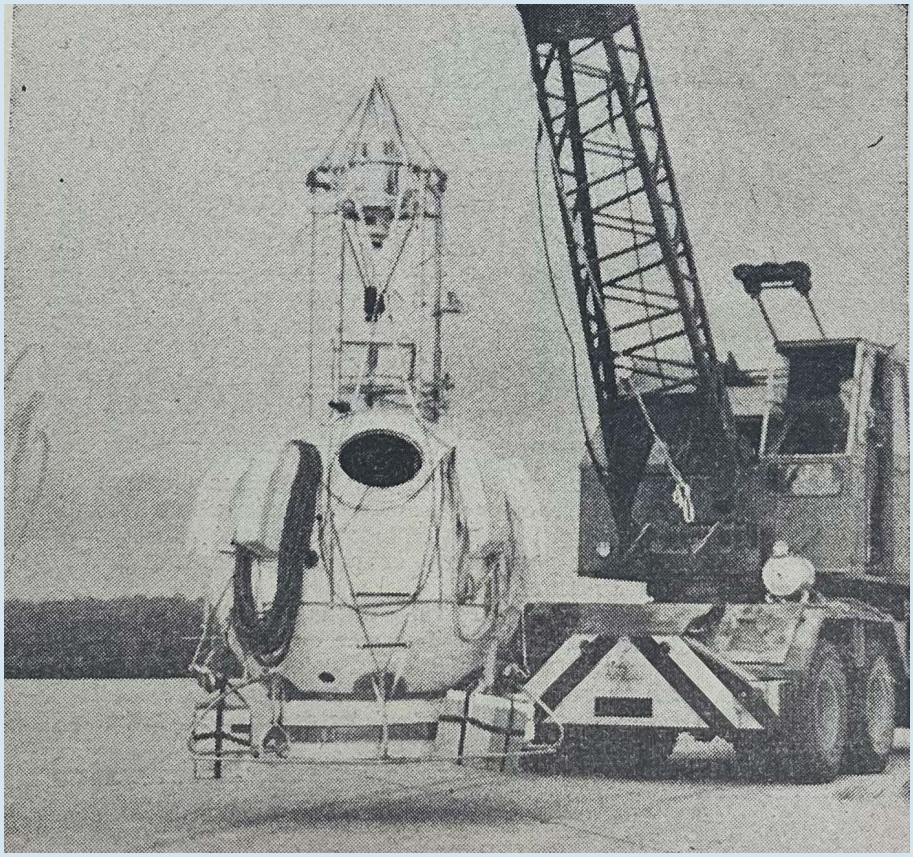


The History of Space Science

Licensing opportunity

Cover image: PREM 13/3012 UNITED STATES OF AMERICA (USA). US space flights (Apollo 11): exchange of messages

Introduction



FO 371/171035: Space research in France

The history of space science is one of humanity’s most remarkable achievements, blending groundbreaking discoveries, technological innovations, and international collaboration. While global superpowers like the United States and the Soviet Union have long dominated the public perception of space exploration, the United Kingdom has also played a significant yet often overlooked role in advancing space science, as uncovered by the rich archival material housed here at The National Archives.

This project proposes the development of an academic platform to explore and document the UK’s rich history in space science using primary source materials from The National Archives. From government and international communications to scientific correspondence, and technical reports, our records uncover key milestones in British space science history for researchers and academics globally. The digitisation and analysis of these records will provide researchers, educators, and the public with valuable insights into the UK's role in the evolving field of space exploration.

Seeking to inspire academic engagement by highlighting themes such as Cold War-era scientific diplomacy, satellite development programs, and Britain's involvement in international space research, this collection will shed a light on the UK's contributions and the societal impacts of these advancements, offering a richer, more complete understanding of the global space science narrative.

The subject

Throughout history, Great Britain has played a key role in space science, contributing to discoveries, satellites, and international collaboration. While often overshadowed by the US and USSR, Britain's innovations in astronomy, satellite technology, and planetary research have left a lasting impact.

Post-War Developments:

Following the Second World War, Britain advanced rocket and missile technology with the Royal Aircraft Establishment (RAE) leading research. The Skylark rocket program, launched in 1957, supported upper-atmosphere research and became a major British contribution. Records at The National Archives include engineering reports, launch logs, and diplomatic correspondence.

Satellite Innovation:

In 1971, Britain launched the Prospero satellite using the Black Arrow rocket, marking the UK's only independent satellite launch. The National Archives holds design plans, mission reports, and policy discussions on this achievement.
International Collaboration:

Britain shifted from independent rocket development to partnerships, joining the European Space Research Organisation, ESRO (now ESA, after merging with ELDO – European Launch Development Organisation) and contributing to missions such as Ariane, Rosetta, and Mars Express. An array of records at the Archive often include diplomatic correspondence and technical documents on institutions such as The Jodrell Bank Observatory, which also tracked early Soviet and US satellites during the Cold War.

Cultural Influence:

Britain's involvement in space science and the Space Race had a notable cultural impact. Popular fascination with space exploration inspired science fiction literature, television programs, and public engagement with astronomy. Records at The National Archives highlight the intersection of scientific progress with cultural trends, including public outreach campaigns, educational initiatives, and media coverage.

Modern Contributions:

Today, the UK remains active in planetary research, astrophysics, and satellites. The Rutherford Appleton Laboratory contributes to projects like the Solar Orbiter and James Webb Space Telescope, while the UK Space Agency continues to lead national space efforts.

The records

The National Archives' rich collection of records offers a valuable foundation for documenting this legacy. Developing an academic platform on this subject area would enable researchers, educators, and students to explore Britain's pivotal role in advancing space science.

The records held at The National Archives are invaluable for understanding the development and impact of space science. They encompass a wide variety of file classes that document the UK's governmental, scientific, and industrial contributions to space exploration. Key file classes include:

AVIA	Records from the Ministry of Aviation and successors cover research and development of significant aerospace technologies, through a variety of reports, diagrams and general correspondence.
CAB	Records of the Cabinet Office contain many high-level policy discussions and decisions regarding space exploration and international treaties. These records cover a variety of different key events in global Space Exploration History, including commentary on the Space Race, European collaboration on Space policy and other astronomical feats.
DEFE	Records of the Ministry of Defence documents military applications of space technology, including satellite development. These records contain further technological detail providing an illustrative and deeper context to the policy and general correspondence files in other departments.
DSIR	Records selected from the Department of Scientific and Industrial Research cover an array of different documents, primarily on government-funded scientific research into space science and technology.
FO and FCO	Records from the Foreign Office on international cooperation, space treaties, and diplomatic engagement in the space race, and other international relations regarding Space exploration.
PREM	Records from the Prime Minister's Office contain correspondence and papers on Space research, key space events and international relations with US, the USSR and others.

This diversity of records highlights the UK's pivotal role in global space exploration, offering rich insights into the intersections of science, policy, and society. By digitising and curating these materials, the collection would offer unparalleled access to British primary sources that are critical for understanding the history and development of space science. For a more detailed breakdown on specific series and sub-series, please contact associates@nationalarchives.gov.uk for the full Excel spreadsheet.

The market

The growing academic interest in Space Science positions a digital collection using The National Archives' material particularly valuable. University courses across the UK and US increasingly explore themes such as Cold War politics, scientific innovation, and the cultural impact on the Space Race. Undergraduate programs in history, science communication and aerospace engineering regularly include modules that examine these themes. A dedicated platform would support researchers seeking primary sources for dissertation work, while also benefit students studying topics such as Britain's technological contributions, space diplomacy and public engagement with Space Science.

UK

University	Course title	Description
Birkbeck University	Introduction to planetary science and space exploration	One of the key aims include knowledge of the key principles of planetary exploration and the history of space exploration
University of Sheffield	History of Astronomy	Module built into the Physics and Astrophysics course provides an introduction into the historical development of modern astronomy
Queen Mary	Controversies of Science and Technology in the Making of the Modern World	Module built into the History and Contemporary History cours
Royal Holloway	Modern and Contemporary History	Modules include 'Apocalypse Postponed: The Global Cold War 1945-98' with key themes including the Space Race and international relations in technology advancements
University of Southampton	The Space Age	Module built into the History Undergraduate programme.
University of Hertfordshire	Astrophysics with Space Science	Strong emphasis on history of Space Science, especially due to the building of Blue Streak at Hatfield
University of Warwick	Medicine, Identity and Technology in Modern History	Including module on 'Rockets, Politics and Public perception, focussing on the public perceptions of The Space Race, and the national identities involved.

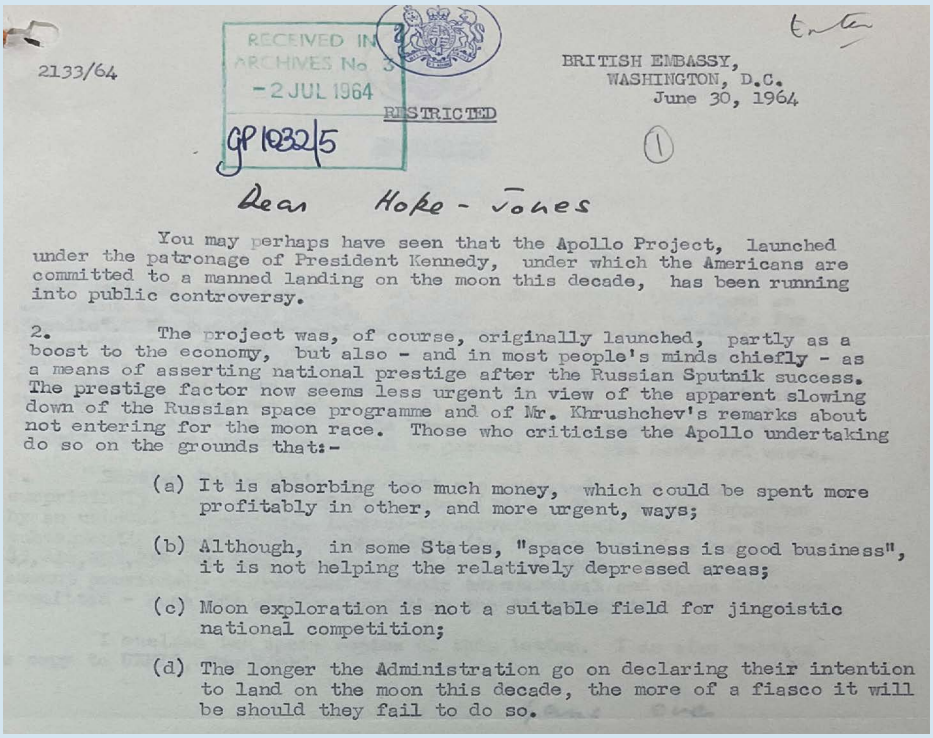
US and International

University	Course title	Description
University of Groningen	Physics, Astronomy and Society	Explores the societal impact of astronomy, including historical and philosophical dimensions
Universidad Pompeu Fabra	The Space Race: A Cultural History in the Cold War	course aims to study the historical roots of nowadays cultural dimension of the Space Race in the Cold War (1947 - 1991), with a special focus on the period between the Sputnik (1957) to the Apollo-Soyuz program (1975)
University of California, Santa Barbara	Science and Technology in The Cold War	Explores the history of science and technology in the Cold War, including science/state relationship, government secrecy and international relations and the Space Race
University of Colorado	Astronauts and Astropolitics: Space Exploration from the Cold War to the Future	examines the relationships between history, science, and politics of the Space Age, beginning with the early space flight pioneers and the Cold War's Space Race
Michigan Institute of Technology	Science, Technology, and Society Program	Interdisciplinary program focusing on the history and societal impact of space science and technology.
Queen's University	The Global Space Age	History course focussed on the Space Age, international political relationships during the Cold War

As you can see from the above tables, global academic interest in the study of Space Science history continues to grow, with a large emphasis on exploring its relationships with politics and society, as exemplified through the frequent study focus of the Cold War. As today's technology and advancements in the Space Exploration sector grows, alongside political relations between the US, UK and Russia, the demand for a collection on the history of significant Space Science feats and their impact on global societies becomes prevalent.

Case studies

FO 371/176276: US Space Projects: International critique and doubt of the Apollo Project.



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RECEIVED IN ARCHIVES No 3
-2 JUL 1964
GP 1932/5

RESTRICTED

BRITISH EMBASSY,
WASHINGTON, D.C.
June 30, 1964

(1)

Dear Hoke-Jones

You may perhaps have seen that the Apollo Project, launched under the patronage of President Kennedy, under which the Americans are committed to a manned landing on the moon this decade, has been running into public controversy.

2. The project was, of course, originally launched, partly as a boost to the economy, but also - and in most people's minds chiefly - as a means of asserting national prestige after the Russian Sputnik success. The prestige factor now seems less urgent in view of the apparent slowing down of the Russian space programme and of Mr. Khrushchev's remarks about not entering for the moon race. Those who criticise the Apollo undertaking do so on the grounds that:-

(a) It is absorbing too much money, which could be spent more profitably in other, and more urgent, ways;

(b) Although, in some States, "space business is good business", it is not helping the relatively depressed areas;

(c) Moon exploration is not a suitable field for jingoistic national competition;

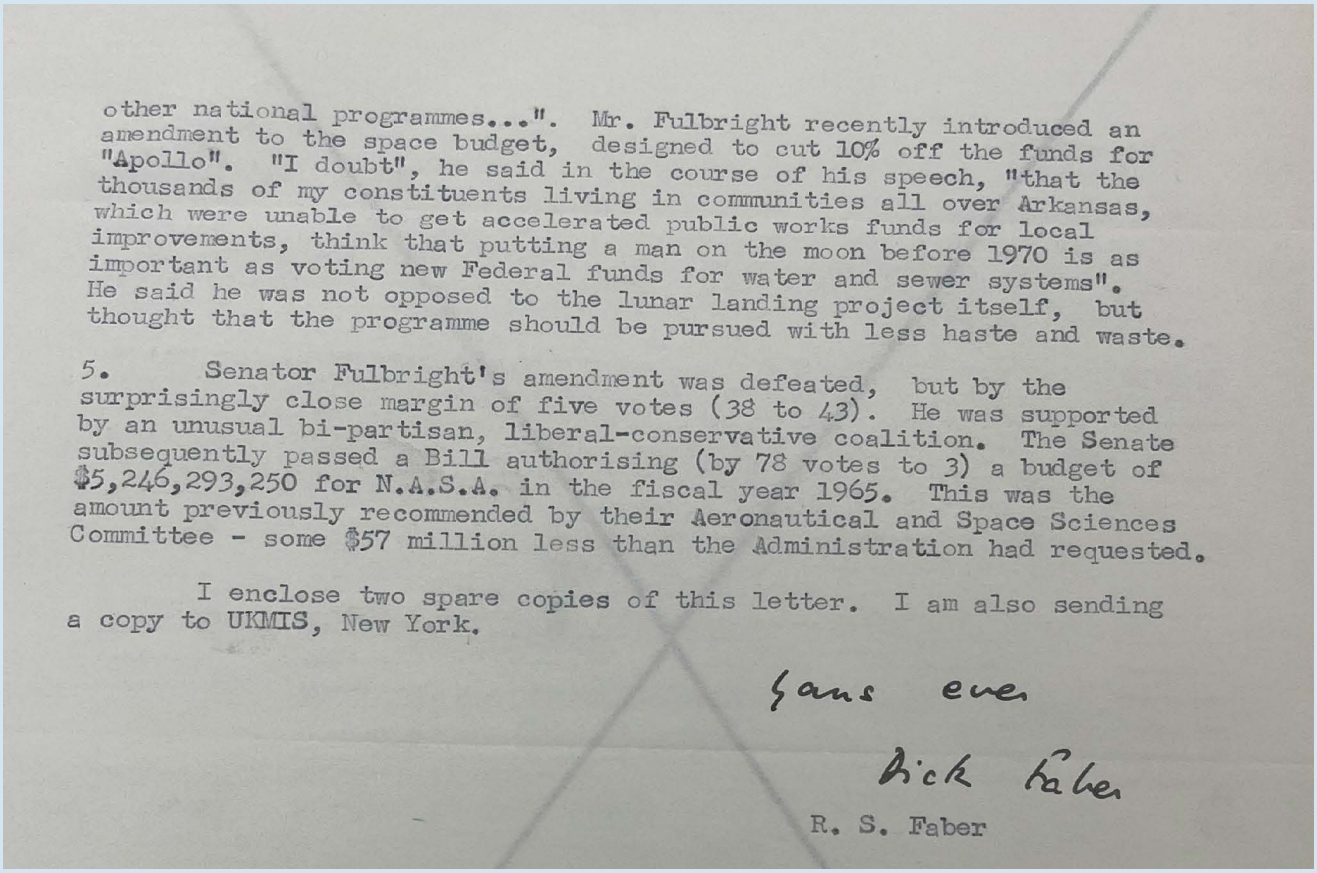
(d) The longer the Administration go on declaring their intention to land on the moon this decade, the more of a fiasco it will be should they fail to do so.

FO 371/176276: US Space Projects

From the iconic Space Race to today's Artemis Programme, the legacy of Space exploration continues to fascinate researchers and space researchers across the world. However, as often is the case with impressive technological feats, the field of Space Science has never been without its critiques, an example of which can be seen in the below document on public controversy surrounding USA's iconic Apollo Project. Here, the American's commitment to achieving the first manned landing on the moon is seen to garner concerns around the cost of the mission, and calls into question just how strong the support for its success was.

Within the document it is clear that the justification for the mission's spending and suitability in "jingoistic national competition" is challenged. The concerns raised are shown to be bi-partisan, from General Eisenhower describing the landing as a "stunt" to Senator Fulbright believing the US to place "excessive emphasis on space in relation to other national programmes".

Though now considered a patriotic moment in American history, the resistance that was placed against the administration through significantly reduced budgets and voiced criticisms from within the US government illustrate both the global and diplomatic concern and lack of confidence in this iconic project. Studying such documents with the hindsight of today allows researchers and students to impactfully analyse the shifts in societal attitudes towards international relations regarding the ever-growing and developing field of technology.



other national programmes...". Mr. Fulbright recently introduced an amendment to the space budget, designed to cut 10% off the funds for "Apollo". "I doubt", he said in the course of his speech, "that the thousands of my constituents living in communities all over Arkansas, which were unable to get accelerated public works funds for local improvements, think that putting a man on the moon before 1970 is as important as voting new Federal funds for water and sewer systems". He said he was not opposed to the lunar landing project itself, but thought that the programme should be pursued with less haste and waste.

5. Senator Fulbright's amendment was defeated, but by the surprisingly close margin of five votes (38 to 43). He was supported by an unusual bi-partisan, liberal-conservative coalition. The Senate subsequently passed a Bill authorising (by 78 votes to 3) a budget of $5,246,293,250 for N.A.S.A. in the fiscal year 1965. This was the amount previously recommended by their Aeronautical and Space Sciences Committee - some $57 million less than the Administration had requested.

I enclose two spare copies of this letter. I am also sending a copy to UKMIS, New York.

Yours ever,

Dick Faber

R. S. Faber

FO 371/176276: US Space Projects

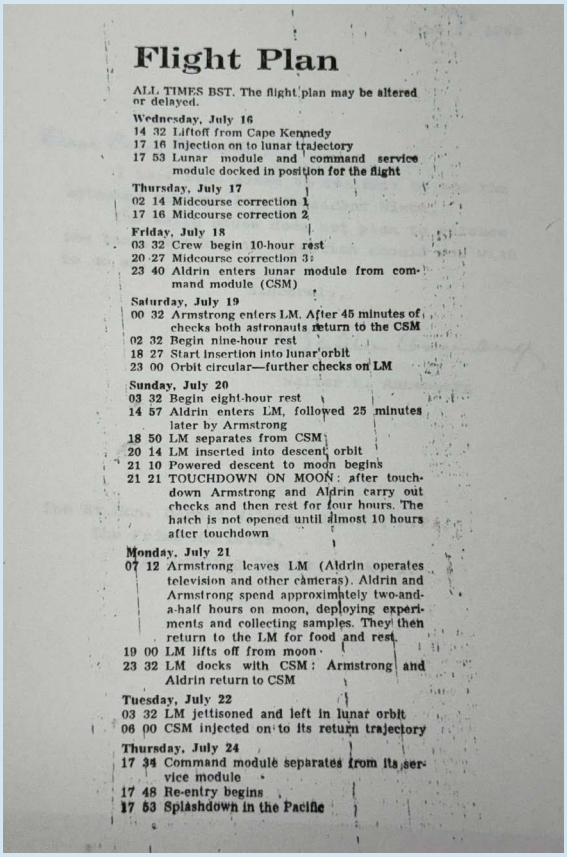
PREM 11/3995, 3543 and PREM 13/3012: Following the great Space Race and its impact on British society

Britain had always had a keen interest in space policies, and the advancements between the US and The Soviet Union continued to fascinate Britain as the events of 'The Space Race' played out, garnering many different personal opinions, much of which is captured in a variety of PREM files. When the Soviet spacecraft Luna 2 reached the surface of the Moon on 13 September 1959, the only person who wasn't very excited about it was the Foreign Secretary, Selwyn Lloyd, who 'said in a moment of irritation to a reporter who badgered him on the tarmac: "I don't think many people are terribly interested in the Russian rocket"' (PREM 11/3995).

At the beginning of the 1960s, the Soviets were 'winning' the Space Race. In October 1957, they had successfully launched a satellite, Sputnik 1, into orbit. It was followed in November by the launch of Sputnik 2, which carried one of the most famous dogs in history, Laika, a stray mongrel picked up from the street in Moscow (sadly, she died within the fourth orbit round). On 12 April 1961, Major Yuri Gagarin became the first man to orbit around Earth.

Gagarin visited the UK in July 1961, and was received as a hero wherever he went. The British ambassador to West Germany, Sir Christopher Steel, reported 'the average German finds it alarming that the British, who are supposed to be reserved and politically mature, should rave over a Bolshevik on a propaganda mission, even if he is a hero'.

The great Space Race continued to captivate both the British government with the PREM files displaying an almost live illustrations to public perceptions at the time.



Flight Plan

ALL TIMES BST. The flight plan may be altered or delayed.

Wednesday, July 16
14 32 Liftoff from Cape Kennedy
17 16 Injection on to lunar trajectory
17 53 Lunar module and command service module docked in position for the flight

Thursday, July 17
02 14 Midcourse correction 1
17 16 Midcourse correction 2

Friday, July 18
03 32 Crew begin 10-hour rest
20 27 Midcourse correction 3
23 40 Aldrin enters lunar module from command module (CSM)

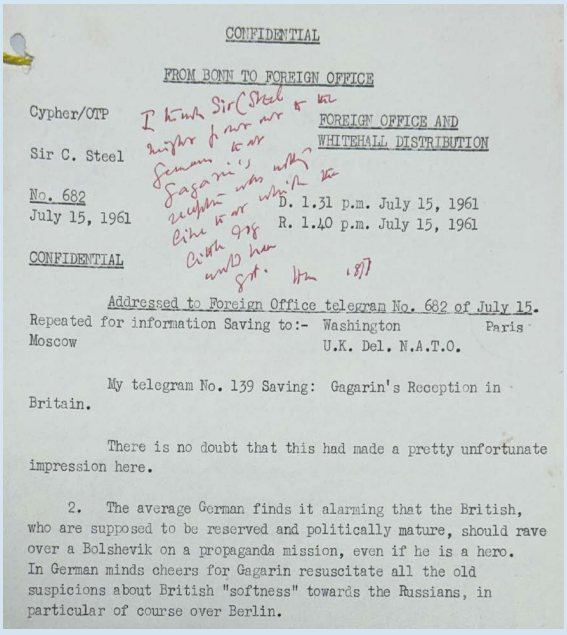
Saturday, July 19
00 32 Armstrong enters LM. After 45 minutes of checks both astronauts return to the CSM
02 32 Begin nine-hour rest
18 27 Start insertion into lunar orbit
23 00 Orbit circular—further checks on LM

Sunday, July 20
03 32 Begin eight-hour rest
14 57 Aldrin enters LM, followed 25 minutes later by Armstrong
18 50 LM separates from CSM
20 14 LM inserted into descent orbit
21 10 Powered descent to moon begins
21 21 TOUCHDOWN ON MOON: after touchdown Armstrong and Aldrin carry out checks and then rest for four hours. The hatch is not opened until almost 10 hours after touchdown

Monday, July 21
07 12 Armstrong leaves LM (Aldrin operates television and other cameras). Aldrin and Armstrong spend approximately two-and-a-half hours on moon, deploying experiments and collecting samples. They then return to the LM for food and rest.
19 00 LM lifts off from moon
23 32 LM docks with CSM: Armstrong and Aldrin return to CSM

Tuesday, July 22
03 32 LM jettisoned and left in lunar orbit
06 00 CSM injected on to its return trajectory

Thursday, July 24
17 34 Command module separates from its service module
17 48 Re-entry begins
17 53 Splashdown in the Pacific



CONFIDENTIAL

FROM BONN TO FOREIGN OFFICE

Cypher/OTP

Sir C. Steel

No. 682
July 15, 1961

FOREIGN OFFICE AND WHITEHALL DISTRIBUTION

D. 1.31 p.m. July 15, 1961
R. 1.40 p.m. July 15, 1961

CONFIDENTIAL

Addressed to Foreign Office telegram No. 682 of July 15.
Repeated for information Saving to:- Washington Paris Moscow U.K. Del. N.A.T.O.

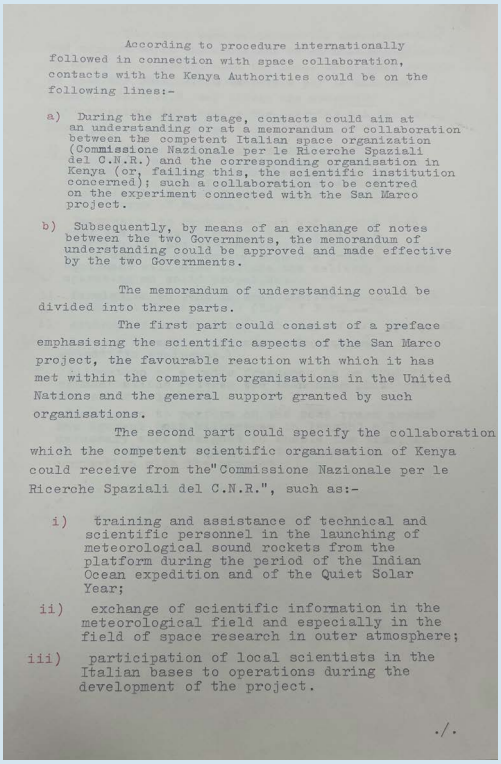
My telegram No. 139 Saving: Gagarin's Reception in Britain.

There is no doubt that this had made a pretty unfortunate impression here.

2. The average German finds it alarming that the British, who are supposed to be reserved and politically mature, should rave over a Bolshevik on a propaganda mission, even if he is a hero. In German minds cheers for Gagarin resuscitate all the old suspicions about British "softness" towards the Russians, in particular of course over Berlin.

PREM 13/3012: UNITED STATES OF AMERICA (USA). US space flights (Apollo 11): exchange of messages

FO 371/171036: Space Programs in Italy: The San Marco Program and Global collaboration



According to procedure internationally followed in connection with space collaboration, contacts with the Kenya Authorities could be on the following lines:-

a) During the first stage, contacts could aim at an understanding or at a memorandum of collaboration between the competent Italian space organization (Commissione Nazionale per le Ricerche Spaziali del C.N.R.) and the corresponding organisation in Kenya (or, failing this, the scientific institution concerned); such a collaboration to be centred on the experiment connected with the San Marco project.

b) Subsequently, by means of an exchange of notes between the two Governments, the memorandum of understanding could be approved and made effective by the two Governments.

The memorandum of understanding could be divided into three parts.

The first part could consist of a preface emphasising the scientific aspects of the San Marco project, the favourable reaction with which it has met within the competent organisations in the United Nations and the general support granted by such organisations.

The second part could specify the collaboration which the competent scientific organisation of Kenya could receive from the "Commissione Nazionale per le Ricerche Spaziali del C.N.R.", such as:-

i) training and assistance of technical and scientific personnel in the launching of meteorological sound rockets from the platform during the period of the Indian Ocean expedition and of the Quiet Solar Year;

ii) exchange of scientific information in the meteorological field and especially in the field of space research in outer atmosphere;

iii) participation of local scientists in the Italian bases to operations during the development of the project.

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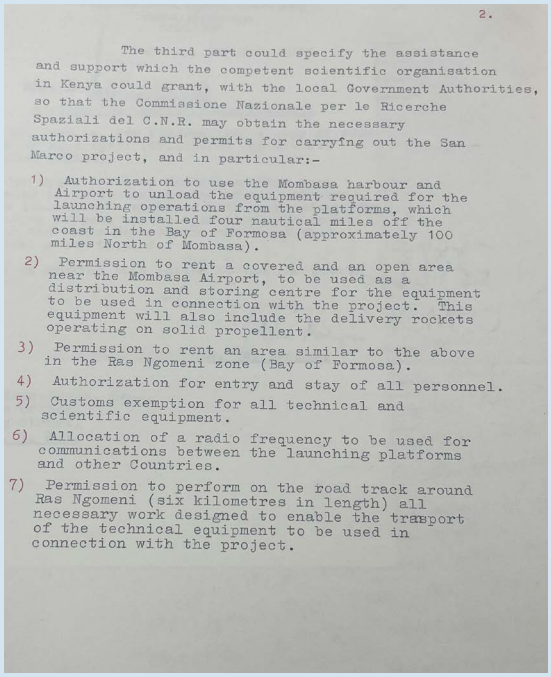


2.

The third part could specify the assistance and support which the competent scientific organisation in Kenya could grant, with the local Government Authorities, so that the Commissione Nazionale per le Ricerche Spaziali del C.N.R. may obtain the necessary authorizations and permits for carryfng out the San Marco project, and in particular:-

1) Authorization to use the Mombasa harbour and Airport to unload the equipment required for the launching operations from the platforms, which will be installed four nautical miles off the coast in the Bay of Formosa (approximately 100 miles North of Mombasa).

2) Permission to rent a covered and an open area near the Mombasa Airport, to be used as a distribution and storing centre for the equipment to be used in connection with the project. This equipment will also include the delivery rockets operating on solid propellent.

3) Permission to rent an area similar to the above in the Ras Ngomeni zone (Bay of Formosa).

4) Authorization for entry and stay of all personnel.

5) Customs exemption for all technical and scientific equipment.

6) Allocation of a radio frequency to be used for communications between the launching platforms and other Countries.

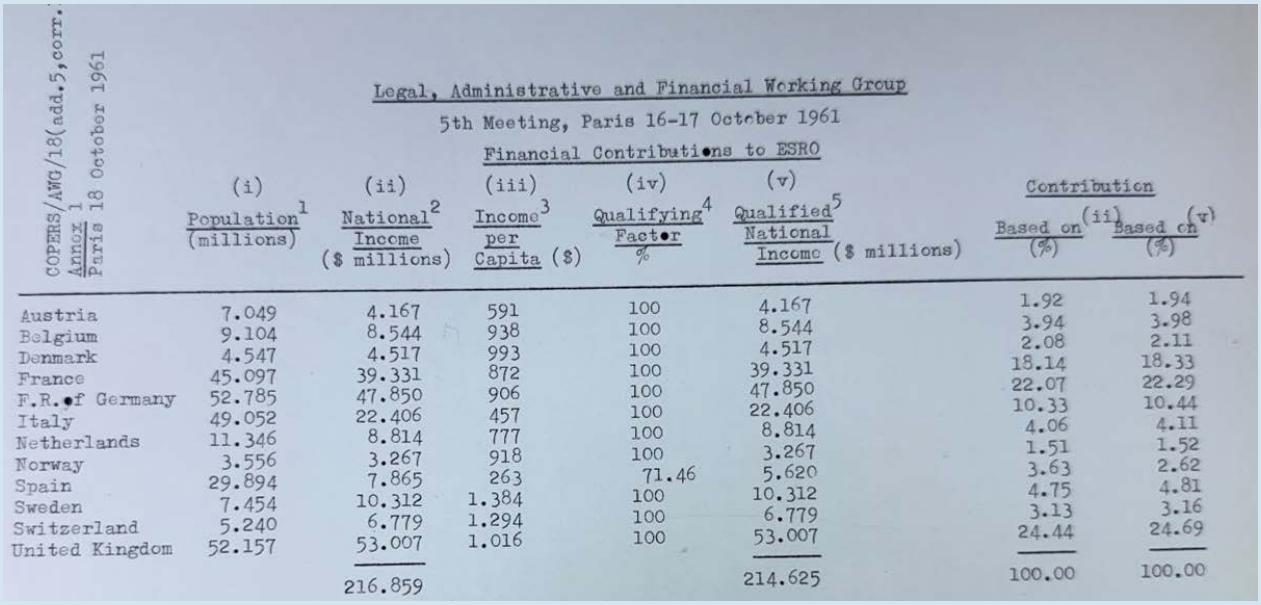
7) Permission to perform on the road track around Ras Ngomeni (six kilometres in length) all necessary work designed to enable the transport of the technical equipment to be used in connection with the project.

FO 371/171036: Space Research in Italy

Following the US' success of the first American in Space, other nations begin to explore the possibilities of the space sector, which had previously been the exclusive domain of the two superpowers of the Cold War. One European project in particular was the San Marco Project - a joint Italian-US space program, focused on launching scientific satellites using Scout launch vehicles from a mobile platform near the equator, making Italy the third country to independently operate a space launch site and the fifth to place its own satellite in orbit.

With Italy a member of ELDO and ESRO, the British Government's interest in their advancements of Space exploration introduced the idea of potential collaboration between Italy and Kenya, with British government facilitating between the two.
As shown in Foreign Office correspondence below, the appetite for collaboration on such significant feats of Scientific advancements was one that was truly shared globally. Noting the support of organisations such as The United Nations, this correspondence also illustrates how the instrumental participants of such technological advancements goes beyond the typical western players of Europe and the US. Not only is evidence of the use of African resources to the project provided here, but also exposes the lesser known need of such resources, which otherwise goes uncredited or often hidden from main western narratives of Space history.

CAB 124/2328: ESRO Convention: Britain's global collaboration



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Annex 1
Paris 18 October 1961

Legal, Administrative and Financial Working Group
5th Meeting, Paris 16-17 October 1961
Financial Contributions to ESRO

	(i) Population[1] (millions)	(ii) National[2] Income ($ millions)	(iii) Income[3] per Capita ($)	(iv) Qualifying[4] Factor %	(v) Qualified[5] National Income ($ millions)	Contribution Based on (ii) (%)	Contribution Based on (v) (%)
Austria	7.049	4.167	591	100	4.167	1.92	1.94
Belgium	9.104	8.544	938	100	8.544	3.94	3.98
Denmark	4.547	4.517	993	100	4.517	2.08	2.11
France	45.097	39.331	872	100	39.331	18.14	18.33
F.R.of Germany	52.785	47.850	906	100	47.850	22.07	22.29
Italy	49.052	22.406	457	100	22.406	10.33	10.44
Netherlands	11.346	8.814	777	100	8.814	4.06	4.11
Norway	3.556	3.267	918	100	3.267	1.51	1.52
Spain	29.894	7.865	263	71.46	5.620	3.63	2.62
Sweden	7.454	10.312	1.384	100	10.312	4.75	4.81
Switzerland	5.240	6.779	1.294	100	6.779	3.13	3.16
United Kingdom	52.157	53.007	1.016	100	53.007	24.44	24.69
		216.859			214.625	100.00	100.00

CAB 124/2328: ESRO Convention

Whilst the space race underway between US and USSR, Britain's own Space Exploration journey saw progression in developing European committees on Space, ESRO and ELDO.

ESRO, the European Space Research Organisation, was an international organization established in 1964 by ten European nations to pursue collaborative scientific space research, with Denmark joining later and Norway and Austria granted observer status. ESRO focused on scientific missions and operated from 1964 to 1975 when it merged with ELDO (European Launcher Development Organisation) to form ESA (European Space Agency).

ESRO's primary goal was to foster cooperation among European nations in space research and technology for peaceful purposes. It launched several research satellites, including ESRO-2B (also known as Iris), Aurorae (ESRO-1A), HEOS-1, and Boreas, using NASA rockets. ESRO also established key facilities like ESTEC (European Space Research and Technology Centre) for engineering and testing satellites, and ESRIN (European Space Research Institute) for research.
Notes on the initial agreement drafts of the establishment of ESRO and its conventions can be found in CAB 124, including details on each members' financial contributions to the organisation, as shown on the right and below.

Ultimately, the organisation faced challenges including underfunding and disagreements among member states regarding resource allocation. These issues contributed to the decision to merge with ELDO, which was also struggling with similar problems, to create the European Space Agency in 1975.