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Global Networking and the Contrapuntal Node

The Project Mercury Earth Station in Zanzibar, 1959–64¹

Lisa Parks

THE PHOTOS ON THE OPPOSITE PAGE reveal the ruins of a US satellite tracking station on Zanzibar (see Figure 1), a semi-autonomous island that is now part of Tanzania and home to a community of citizens of African, Arab, and European descent. In 1960 the US government and British protectorate of Zanzibar, signed an agreement that allowed US contractors working for the National Aeronautics and Space Administration (NASA) to build an earth station that would support Project Mercury, the first US manned satellite mission.² The facilities, which cost \$3 million USD³ were constructed in the villages of Tunguu and Chwaka on the cusp of Zanzibar's revolution for political independence. Ruled for centuries by the Sultan of Oman, and a site of slave trade until 1897, the island became a British protectorate in 1890. Sir George Mooring, who served as the British Resident from 1959–1964 handled the Mercury station matter on behalf of the Sultan of Zanzibar, Sayyid Sir Abdullah bin Khalifa Al-Said, who reigned from 1911–1960. By the late 1950s, a medley of opposition leaders and parties, including the Zanzibar Nationalist Party, the Zanzibar and Pembe Peoples Party, Umma Party, and the Afro-Shirazi Party, challenged the dynasty's legacy of socio-economic and racial oppression. Because of this, the Project Mercury station's construction was embroiled in a web of political conflicts and concerns.⁴

¹ I am grateful to the IKKM for a fellowship in May–July 2018, during which time I drafted this article. I also thank Matthew Graydon and Harun Maye for their helpful assistance, and IKKM fellows for their helpful questions and comments on an early version.

² Enclosure No. 1 (Final Agreement for Mercury station in Zanzibar), Embassy of the United States of America, No. 115, signed by John Hay Whitney, Oct. 14, 1960. Folder 1960, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. Zanzibar Project Mercury RG 59, General Records of the Department of State, National Archives.

³ Hedrick Smith: U.S. Will Remove Zanzibar Station, in: *The New York Times* (April 8, 1964), <https://www.nytimes.com/1964/04/08/us-will-remove-zanzibar-station.html> (31 May 2018).

⁴ For further discussion see Don Petterson: *Revolution in Zanzibar: An American's Cold War Tale*, Boulder 2002.

I became interested in the history of this earth station during a research trip to Tanzania in January 2018. I went to Tanzania and Zanzibar to continue media infrastructure research I had conducted in neighboring Zambia from 2012 to 2016, and, specifically, to try and understand more about the various facilities and labor practices involved in moving internet traffic from undersea cable landings off the coast of Tanzania, through national fibre optic systems to local communities in southern Africa's rural interior. I stumbled upon the Project Mercury ruins somewhat by accident. After a site visit and informal interviews with individuals who now live in that area, I decided to probe further and submitted Freedom of Information Act (FOIA) requests to the US State Department, NASA, and the USIA, and gathered and reviewed archival records. I suggest that these ruins (see Figure 1) incarnate a significant moment in the history of global networked communication, a moment in which the US further elaborated diplomatic, technical, and financial processes for installing interlinked telemetry and tracking stations in and across others' sovereign territories.⁵ This, of course, was not the first time the US had installed tracking stations. In 1957, in response to Sputnik's launch, the US military established a chain of satellite tracking stations known as the Minitrack Network across Cuba, Panama, Ecuador, Peru, and Chile to monitor the Project Vanguard satellite, which exploded on its launch pad.⁶ As Pedro Ignacio Alonso reminds us, many satellite earth stations have been installed in the »global south.«⁷ Yet as Christine Evans and Lars Lungren observe in their research on Inter-sputnik, the international history of earth station development and the collaborations it required remain relatively unknown in media and communication studies.⁸ To address this gap, Alonso calls for a »space archaeology« that considers »things moving,« ranging from relayed signals to orbiting satellites, and suggests that earth station infrastructure »moved in different directions and at different speeds« and generated »a framework for our current ecology of communication [...]«⁹

⁵ Saul Gass: Project Mercury's Man-in-Space Real-Time Computer System: You Have a Go, at Least Seven Orbits, in: IEEE Annals of the History of Computing 21/4 (1999), p. 37.

⁶ Pedro Ignacio Alonso: NASA in Chile: Technology and Branding of a Satellite-Tracking Station, in: Design Issues 33/2 (April 2017), pp. 31–42.

⁷ Pedro Ignacio Alonso: Introduction: Towards an Archaeology of Things Moving, in: Pedro Ignacio Alonso (ed.): Space Race Archaeologies, Berlin 2016, p. 7. Also see Peter Redfield: Space in the Tropics: From Convicts to Rockets in French Guiana, Berkeley 2000.

⁸ Christine Evans and Lars Lungren: Dividing the Cosmos? INTELSAT, Intersputnik, and the development of transnational satellite communications infrastructures during the Cold War, in: Mari Pajala and Alice Lovejoy (eds.): Remapping Cold War Media: Institutions, Infrastructures, Networks, Exchanges, Bloomington, Indiana 2020.

⁹ Alonso: Introduction (as note 7), p. 6.

To contribute to this space archaeology, this article focuses on the development of the Project Mercury earth station in Zanzibar during the period, 1959–1964. To historicize the earth station's establishment, I adopt a nodal approach and combine archaeological, archival, and phenomenological methods in an effort to bring forth the geopolitical and sociotechnical relations that resulted in the Zanzibar station. My discussion moves from a general description of Mercury's »world-wide tracking« network, to an analysis of Zanzibari opposition to the station, to a recounting of the building of the station in the midst of this opposition. This earth station, not only contributed to the science of satellite tracking and telemetry, it was an essential node in the first »world wide tracking network« to rely on real-time computing to monitor a manned satellite.¹⁰ What is not as well known, however, is the precarious geopolitical fulcrum upon which the Zanzibar Mercury station's precise measurements were taken. Given this, I define the station as a *contrapuntal node*—as a site opposed by local publics—to raise questions about the histories and materialities of other network facilities that have been built against peoples' will. While network extensions and occupations have been structural to colonial power, Africans' responses to and involvement in the formation of particular network nodes is much lesser known. These material relations are significant as they helped to shape early global real-time computing networks that became precursors of the internet and world wide web. As Wendy Chun argues in her crucial research on network cultures, the democratic potential of communication technologies stems from vulnerabilities rather than control. She urges critics to engage with multiple layers and dimensions of networks and to »refuse easy assertions of freedom at one level that cover unfreedom at another.«¹¹ Building on Chun's proposition, in this article I reframe the investigation of network dialectics of freedom and control in relation to the material construction of a node and excavate the social struggles that give life to global networking.

¹⁰ Gass: Project Mercury's Man-in-Space Real-Time Computer System (as note 5), p. 37.

¹¹ Wendy Chun: Control and Freedom: Power and Paranoia in the Age of Fibre Optics, Cambridge, MA 2008, p. 297.

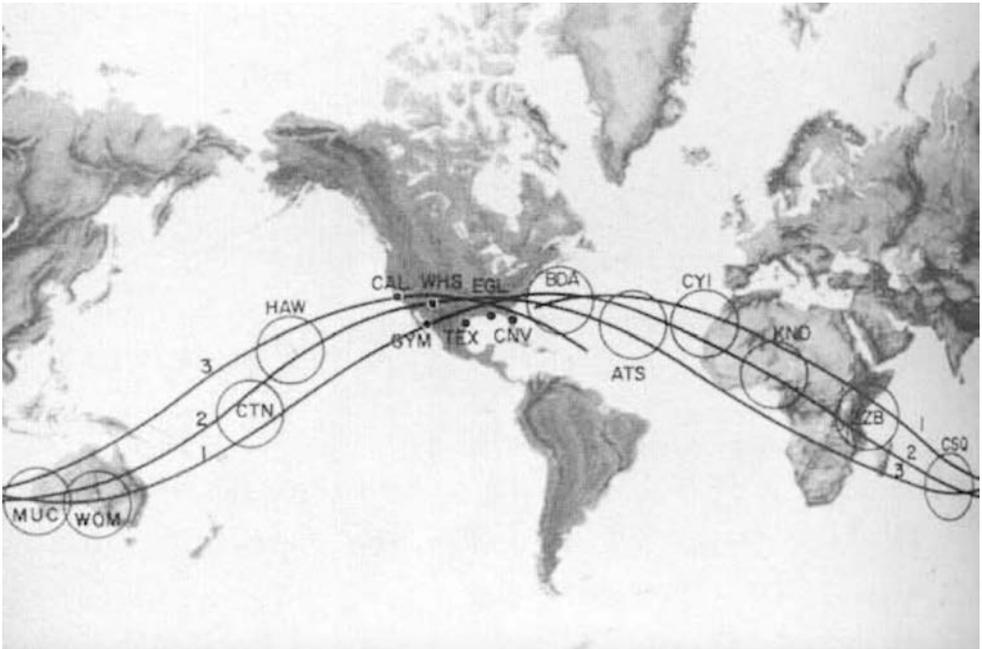
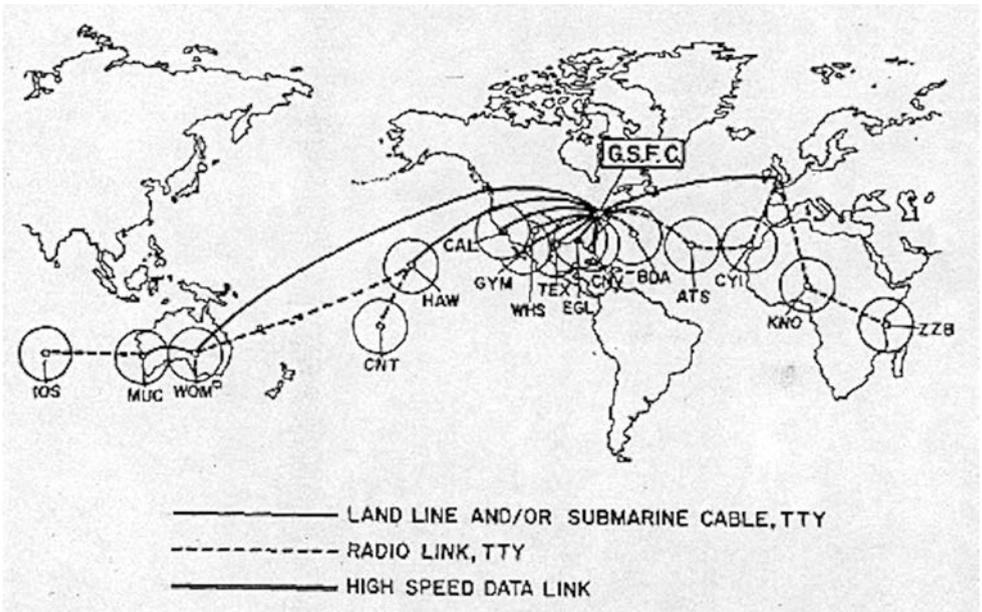


Fig. 2

Fig. 3



———— LAND LINE AND/OR SUBMARINE CABLE, TTY
----- RADIO LINK, TTY
———— HIGH SPEED DATA LINK

1. Project Mercury's »Worldwide Tracking Network«

A total of eighteen earth stations made up the Project Mercury Network. Fourteen of them were range stations, among them two ships in the Atlantic and Indian Oceans, situated along the track of Mercury's orbit and had to be constructed on a tight schedule (see Figure 2). To build these stations the US entered agreements with seven countries: Australia, Bermuda, Mexico, Spain/Canary Islands, UK/Nigeria, UK/Zanzibar, Kanton/Polynesia. Stations in these countries »made radar observations of the spacecraft position, communicated by voice with the astronaut, received telemetry signals from the spacecraft [...]« and were integral to the global network's operation.¹² Each station had a range of 700 nautical miles (1,300 km) and a satellite pass typically lasted seven minutes.¹³ Observations from each station were Teletyped and sent by land line, submarine cable, or radio link to the Goddard Space Flight Center computers for orbital refinement.¹⁴ The circuit map (see Figure 3) reveals that this real-time computing network was far from uniform and was contingent upon a hodge podge of segments, including submarine cables, landlines, radio and high-speed data links, and two »alternate routes.«

Since so many earth stations had to be newly constructed on a simultaneous schedule, NASA contracted Western Electric Company to administer this process and hire subcontractors. IBM developed computing systems, Bendix Corporation installed radar, telemetry and display equipment, and Burns and Roe handled engineering and construction of fourteen tracking stations around the world.¹⁵ Foreign locations were selected after site visits and assessments by teams of State Department representatives and teams of Burns and Roe surveyors. While State Department officials met with local authorities to address political considerations, siting of the station, labor, and financial issues, survey teams »spent several days at each prospective site checking soil conditions, topography, water, sewage disposal, communications, transportation, electric power, and climate.«¹⁶ The team then prepared a comprehensive report on each site explaining the basis for selection and suggesting equipment design and location. They also provided preferred and alternate locations for each ground station. Since Mercury was a *manned* satellite, these stations were considered »lifelines,« and redundancies were built in at every level.

¹² Gass: Project Mercury's Man-in-Space Real-Time Computer System (as note 5), p. 43.

¹³ John Catchpole, Project Mercury – NASA's First Manned Space Programme, (Chichester, UK: Springer Praxis, 2001), pp. 121, 126.

¹⁴ Gass: Project Mercury's Man-in-Space Real-Time Computer System (as note 5), p. 43.

¹⁵ Ibid., p. 40.

¹⁶ Niles R. Heller, et al: MERCURY PROJECT SUMMARY (NASA SP-45), in: NASA History website, undated, <https://history.nasa.gov/SP-45/ch8.htm> (31 May 2018).

2. Project Mercury in Zanzibar

Plans for the Mercury station in Zanzibar commenced in August 1959. Following a site visit by a Burns and Roe staff, the US State Department began drafting an agreement with Britain and Zanzibar modeled on the one signed by the Canary Islands and Spain. The agreement enabled the US to construct, install, equip, and operate two facilities on the island of Zanzibar—a tracking/receiving station in Tunguu and transmission station in Chwaka. It stipulated that the US would lease the land, pay for road construction, operate power generators on site, and work with the island's Cable and Wireless authorities to secure a radio frequency allocation and run telecommunication cables to the two sites. Given multiple layers of bureaucratic review and discussion, the contract was not signed until more than a year later, in October 1960, even though construction of the station began in April.¹⁷

US records from NASA, the US State Department, and USIA reveal a tense and challenging political environment in Zanzibar during the agreement's development and station construction, and highlight local political leaders' and parties' opposition to the Mercury station. By 1959 multiple parties were asserting Zanzibar's political independence, and the Mercury station became a key issue. Concerned that the station was a actually US military project or a »rocket base,« 10,000 Zanzibaris participated in a protest against the installation in June 1960.¹⁸ Zanzibar Nationalist Party (ZNP) leader Ali Mushin condemned the station's establishment, described it as a »danger to the whole of Africa,«¹⁹ and insisted Zanzibar should not become a »pawn« in imperialists' struggle.²⁰ The ZNP asked Britain to revoke permission given to the US government to install the station, even though the agreement had not yet been signed. On July 10, 1960, at a ZNP demonstration attended by 4000 people, a rocket was burned in effigy and party leaders demanded the US abandon »its base.«²¹ Opponents drew political cartoons protesting the station on neighborhood walls. Some Zanzibaris were so opposed to the US out-

¹⁷ Overall Mercury Network Schedule, undated, available at: <https://history.nasa.gov/SP-45/fig8.15.htm>, (23 December 2019).

¹⁸ Memo from Dar es Salaam (Duggan) to Secretary of State, June 15, 1960, Folder: Zanzibar Communications Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

¹⁹ Ibid.

²⁰ Ibid.

²¹ Secret: Project Mercury Installations in Africa, Bloc, Cairo and African Reactions, July 15, 1960, Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.



Fig. 4

post that they sabotaged what they thought to be Mercury-related equipment, cutting four communication cables.

The ZNP integrated news about Mercury in its pamphlets, posters, and press stories,²² and the party's demonstrations were interwoven with a broader pan-Africanist movement against the militarization of Africa. Delegates at a July 1960 Pan-African union conference in Cairo, demanded that all military and satellite tracking stations be eliminated from Africa due to concerns about militarization.²³ In October 1960, Wera Ambito, representative of Kenya African National Union, exclaimed, »these bases will be used to suppress our national movement for freedom and independence and therefore we will persistently oppose them.«²⁴

²² Ibid.

²³ News story in *Tanganikya Standard*, July 2, 1960, referenced in: Secret: Project Mercury Installations in Africa, Bloc, Cairo and African Reactions, July 15, 1960, Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

²⁴ Kenya Nationalist Scores U.S. Bases, Oct. 19, 1960, Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

Apparently unwilling to recognize that Zanzibaris, and Africans more broadly, might have legitimate reasons for opposing the Mercury station (e.g. struggles against colonization; not wanting to give up fifty acres of precious farm land), US officials interpreted Zanzibaris' opposition through the rubric of the Cold War, and characterized the resistance as the result of »bloc« propaganda and influence by what US officials referred to as »ChiComs,« Chinese communists. A July 15, 1960 US State Department memo marked »secret« recounted anti-Mercury propaganda coming from Moscow, Beijing/Peking, East Germany, and Cairo. The memo highlighted a Russian broadcast that applauded »the peoples of Zanzibar [who] took practical steps against the [US] plot by damaging the equipment intended for launching missiles while it was being unloaded from ships.«²⁵ Chinese organizations, the memo continued, sent messages congratulating Zanzibaris for demonstrating »against the U.S. imperialist attempt to establish a rocket base on Zanzibar.«²⁶ In July 1960 the Soviets allegedly published another report describing Mercury stations as »fronts« for military activity.²⁷ According to the US State Department, »bloc propaganda« repeatedly invoked US deception around the U-2 spy plane incident in May 1960. The Soviets shot down a US U-2 spy plane illegally flying through Soviet air space. Initially, US officials lied about the U-2 mission and claimed it was a NASA weather plane, leading »bloc propaganda« to conclude that just »as NASA weather planes concealed U-2 espionage so [the] MERCURY program conceals [a] sinister purpose.«²⁸

In late August 1960, Western Electric's Zanzibar site manager, Paul Pedersen, reported a »steady and strong anti-Mercury campaign [...] kept very much alive in certain local papers, edited and distributed with official assistance from the Chinese communists [...]«²⁹ Pedersen anticipated that with upcoming Zanzibari

²⁵ Secret: Project Mercury Installations in Africa, Bloc, Cairo and African Reactions, July 15, 1960, Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives. Also see Airgram from Amconsul Dar es Salam (Duggan) to Department of State, Oct 4, 1960, Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

²⁶ Ibid.

²⁷ Attachment A (transcription of Soviet report): U.S. Bases Network Threatens Peoples: Missile Base in Zanzibar, July 2, 1960, Folder: 1960, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. Zanzibar Project Mercury RG 59, General Records of the Department of State, National Archives.

²⁸ Secretary of State Memo, Sept. 3, 1960, Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

²⁹ Letter to Goethius from Pederson, Aug. 26, 1960, Folder 1960, 14. Scientific Research &

elections in January 1961, it may be challenging for British hosts to »counteract Nationalists' demand that Mercury get out and stay out.«³⁰ Given this, he suggested outfitting »another« ship off the island's coast to take the place of the Zanzibar earth station if needed.³¹ Other ships were already deployed in the Atlantic and Indian Oceans as part of Project Mercury's global network.

While socialist movements in East Africa may have been influenced and supported by the Soviets and Chinese, it is important to recognize Zanzibari and pan-Africanist political imaginaries and agencies rather than simply absorb them into East/West »blocs« and Cold War geopolitical strategies. Months after the Mercury station was constructed, in May 1961, ZNP leader, Ali Muhsin continued to critique the Project Mercury station, claiming that »no amount of imperialist's white-washing [...] could alter the views of the Zanzibar people against the base« and that those in Zanzibar are aware of the »dangers of neo-colonialism.«³² Building on this position, the ZNP publication, *ZANEWS*, published a August 1961 article entitled, »Against Rocketizing Zanzibar,« which indicated leader Abdulrahman Mohamed Babu attended a memorial in Japan to honor victims of the US atomic bombings in Hiroshima and Nagasaki during World War II, and pointed out the Mercury station could make the island a target of similar such »extermination.«³³ Such discourses suggest that Zanzibaris' opposition to the Mercury station appeared to be grounded as much in anti-colonialism and anti-militarization as in »bloc« alliances.

In addition to reading Zanzibaris comments through the framework of the Cold War, US officials responded to the opposition by publicizing the »civilian« and »scientific« nature of Project Mercury.³⁴ US staff were advised to indicate, »there is nothing secret about this project which is a civilian project concerned with manned space flight and is of a pure research character.«³⁵ A 1961 USIA Infoguide

Development: 14.D Satellite Tracking Stations: 25. Zanzibar Project Mercury RG 59, General Records of the Department of State, National Archives.

³⁰ Ibid.

³¹ Ibid.

³² Consulate General Despatch No 239, May 2, 1961, Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

³³ Memo from American Consul – Zanzibar including transcription of complete text of lead article in Aug. 9, 1961 edition of ZNP publication, *ZANEWS*, Aug 14, 1961, Folder: Zanzibar Communications Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

³⁴ Pedro Ignacio Alonso: NASA in Chile: Technology and Branding of a Satellite-Tracking Station, in: *Design Issues* 33/2 (2017), pp. 31–42.

³⁵ Memo to Tully from Schmertz, July 2, 1960, Folder: 1960, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. Zanzibar Project Mercury RG 59, General Records of the Department of State, National Archives.

stressed the importance of mentioning that Mercury is »civilian in character and direction« and that tracking stations »are open to visits by the public.« The guide emphasized that US »defense« only plays a »supporting role« and »the term missile should not be used in publicity.«³⁶ A March 1961 USIA Infoguide urged: »We should emphasize at all times the purposes of Mercury. This is a valid scientific program, not a stunt.«³⁷ Finally, a USIS memo that belittled the Zanzibari opposition pointed to confusion among Africans about different space technologies, stating »the African is hard to convince of this technical difference between satellites, rockets, missiles and warheads. In translation the difficulty is compounded.«³⁸

Perhaps African confusion was warranted, however, given that both US military facilities and aircraft *were* used to support Project Mercury, complicating designation of it as purely »civilian« and »scientific.« Seeking to resolve such confusions, NASA's staff felt an information campaign should have come much earlier and claimed, the »Zanzibar flap« would not have happened if USIA had been able to soften up the island with a six month campaign of careful, discreet dissemination of information about the project.«³⁹ Given Zanzibari opposition to the Mercury station, British Resident Mooring asked that no US publicity or informational counter-campaign be circulated as he was concerned this would stoke the flames before the January 1961 election and take Zanzibar's viable struggle for political independence process off-course. Beyond this, US records make clear that a *second*, lesser known, US military earth station *had been* established on Zanzibar

³⁶ USIA Infoguide no. 61–66, June 12, 1961, Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

³⁷ USIA Infoguide re: Project Mercury to All USIS Posts, Mar 13, 1961, Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

³⁸ USIS Lagos to USIS Khartoum, Aug 15, 1960, Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives. Also see Note for Policy: Zanzibar File, July 18, 1960, Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

³⁹ Memo to Ehrman from Belcher, July 28, 1960. Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives. There were disagreements, however, about dissemination of local publicity about Mercury in Zanzibar. NASA and the State Department felt that no publicity should be circulated until an agreement was signed between the US and UK, but officials in NASA-IAA and USIA felt it should have come earlier to build Zanzibari support for and acceptance of the station.

to support Project Courier, a US Army Signal Corps satellite project.⁴⁰ Given the anti-militarization position of Zanzibaris, Mooring insisted in June 1960 that the Courier station be removed from the island. The US agreed and spent \$5 million to move the facility to Southern Rhodesia »in order to give Mercury fairest winds possible in Zanzibar.«⁴¹

3. Building the Project Mercury Earth Station

Despite Zanzibari opposition to the Mercury station, the US and UK colluded to support its development. To build the Mercury station in Zanzibar, materials and equipment were transported via African Lightning, a ship operated by Farrell Lines, a subsidiary of U.S. Steel Corporation. The ship left Brooklyn on May 18, 1960 and arrived in Zanzibar Town on June 24, 1960.⁴² The bill of lading reveals a list of Mercury-related equipment, 7 boxes of transformers, building materials, 2 trucks, 1 jeep, tires were brought into Zanzibar.⁴³ Though all of these materials entered Zanzibar duty free, per the agreement between the US and Britain, the British embassy in London advised the US not to call attention to the Mercury project in the marking of containers, as there were intensifying concerns about potential sabotage of the cargo. The



Fig. 5

⁴⁰ Secret Telegram to Amembassy (sic) London Priority 51, July 2, 1960, Folder: Policy – Zanzibar – Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

⁴¹ Memo from London-Whitney to Secretary of State, June 30, 1960, Folder: Zanzibar Communications Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

⁴² Memo, May 18, 1960, Folder 1960, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. Zanzibar Project Mercury RG 59, General Records of the Department of State, National Archives.

⁴³ Farrell Lines, Bill of Lading, African Lightning ship, undated, Folder 1960, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. Zanzibar Project Mercury RG 59, General Records of the Department of State, National Archives.

British embassy further recommended, »that US military aircraft not be used to bring material for station into Zanzibar or any territory in vicinity.«⁴⁴ When the three vehicles (trucks and jeep) were unloaded from African Lightning and driven onto the island, they were met with angry crowds. The vehicles had to be stored in a warehouse for several weeks and Mercury staff used rented cars and taxis.

The buildings and structures for the Mercury station, including »offices, storage, housing, sanitation, and other required purposes,« were to be »prefabricated, transportable, and removeable (sic),« signaling anticipated short-term use.⁴⁵ Most buildings were constructed of galvanized sheet metal supported by steel frames. Spare parts provisioning and local repair capability were other key considerations. Each industry partner in the project provided a 2-year supply of spare parts unique to its equipment and a list of recommended common item spares.⁴⁶ When I visited the Mercury site in 2018 (nearly sixty years after it was built), materials such as concrete foundations and fence posts, a water well, pump houses, and a still standing sheet metal structure, marked the ruins of the Tunguu receiving station. The building's interior was littered with debris. I spent two hours at the site and worked with a translator to talk with six people who now farm this land. They had no knowledge of the Mercury project. A taxi driver and I were only able to find the Tunguu site by pulling over and meeting a man named, Twaham Zane, who was born in 1966 and grew up nearby and remembered hearing about the site. Zane joined us and led us down a dirt road to the ruins.

To construct the Mercury facilities at Tunguu and Chwaka, US contractor Burns and Roe first considered hiring the Italian firm Stirling and Astaldi, as it had extensive »East African experience« and »a large labor force« with »a high proportion of Italian craftsmen and technicians.« However, British Resident Mooring insisted that Zanzibari workers be contracted, emphasizing what he called the »bread and butter« factor. As Mooring saw it, hiring Zanzibari workers was »necessary for the establishment of a cooperative atmosphere with local authorities

⁴⁴ Memo from London-Whitney to Secretary of State, June 30, 1960, Folder: Zanzibar Communications Project Mercury, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. RG 59, General Records of the Department of State, National Archives.

⁴⁵ Draft agreement for Zanzibar and Nigeria drafted by NASA and Sent to US State Department 1959, 14.D Satellite Tracking Stations UK Project Mercury Zanzibar 1959, National Archives accessed May 31, 2018. In theory employees.d rs as well, including, ntexts. al time computing. ol, at might be thought of as a prima.

⁴⁶ In addition to the buildings housing electronic equipment, most stations contained power buildings, cooling towers, air handlers, water chillers, and hydropneumatic tanks. Diesel generators were installed to produce power as a commercial power backup. See Mercury Project Summary (NASA SP-45), 8. Worldwide Support Network, undated, available at <https://history.nasa.gov/SP-45/ch8.htm>, (23 December 2019).

and to prevent possible embarrassment and difficulties both in the construction and operation of the station.«⁴⁷ A US Embassy dispatch from London to the US State Department reinforced this position, noting: »[...] in the present conditions of economic depression and unemployment obtaining in Zanzibar it would cause considerable difficulties and embarrassment if the work were undertaken directly by an outside firm using imported craftsmen and labour.«⁴⁸ Ultimately, Burns and Roe contracted British civil engineering firm, W. & C. French, because the company already had a pool of Zanzibari workers. Approximately two hundred Zanzibaris built the Mercury structures at Tunguu and Chwaka between April and November 1960.⁴⁹ Employees of Western Electric, Burns and Roe, Bendix, and Space Technology, Inc. also contributed. Together these companies sent more than forty staff to Zanzibar for various phases of construction, installation, testing, and operation of the station.⁵⁰ Road, telecommunication, electrical, water and sanitation infrastructures also had to be built to support the fifty-acre Mercury station.

As the station was being built, the facilities had to be secured given ongoing political opposition to the project. On July 10, 1960, the day of a major ZNP demonstration, staff members were advised not to go to work, and Mooring deployed an extra two-hundred security workers, some coming from mainland Tanganyika, to patrol the Mercury station. Western Electric's, Paul Pedersen, recounted meetings with British Resident Mooring and the CIA about the station's security.⁵¹ There were not only security concerns about the buildings and staff, but also about the connecting antenna fields, and overhead and buried cables that tethered the station to the worldwide network.⁵² Mooring offered to protect Mercury station buildings, but explained: »[...] it would be impossible [...] to promise physical

⁴⁷ Memo to file from Zanzibar, May 9, 1959, Folder 1960, 14. Scientific Research & Development: 14D Satellite Tracking Stations: 23. UK Project Mercury-Zanzibar RG 59, General Records of the Department of State, National Archives.

⁴⁸ Dispatch from US Embassy in London to US State Department, Dec 23, 1959, Folder 1960, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. Zanzibar Project Mercury RG 59, General Records of the Department of State, National Archives.

⁴⁹ Construction schedule chart. Need cite for 200 Zanzibari employees. National Archives.

⁵⁰ According to lists in the folder, 19 personnel were sent from Bendix Radio, 8 from Burns and Roe, Inc, 8 from Western Electric Co. and 2 from Bendix Pacific. Folder 1960, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. Zanzibar Project Mercury RG 59, General Records of the Department of State, National Archives.

⁵¹ Letter to Goethius from Pederson, Aug. 26, 1960, Folder 1960, National Archives. As a side note, the CIA had conducted covert operations in Zanzibar and Tanganyika during this period. In January 2017 the US released more than 12 million pages of declassified documents, which reveal its history of spying there. See: <https://www.ipppmedia.com/en/news/top-secret-cia-files-expose-us-covert-operations-tanzania>.

⁵² Letter to Goethius from Pederson, Aug. 26, 1960, Folder 1960, 14. Scientific Research &

protection of widely spaced antenna fields [...].⁵³ The security of earth stations and other communication facilities around the world is an integral yet largely untold aspect of global network history.

Indeed, there is much more to be said about the labor of constructing the Mercury earth stations in Zanzibar and beyond.⁵⁴ The point I wish to emphasize is that the nodes of this »world wide tracking network« did not emerge unfettered; their development was embedded in particular material conditions and political struggles, which demand historical analysis. Zanzibar was just one of the Project Mercury sites, and the archaeologies of others remain to be excavated. Suffice it to say, this node of the world wide tracking network could only emerge because of a strategic, neocolonial partnership between the US and Britain that enabled the duty free shipment and import of US commercial materials and equipment into Zanzibar (even before an agreement was officially signed) and the hiring of a British firm with Zanzibari workers and visiting staff from US companies to build and secure the Mercury station and related infrastructure, all in spite of vociferous Zanzibari political opposition to hosting it. On May 5, 1961, several weeks after cosmonaut Yuri Gagarin's momentous orbital flight on April 12, 1961, the Zanzibar station tracked the Mercury capsule as it carried Alan Shepard into a sub-orbital flight. On February 20, 1962, the station helped to track Mercury astronaut John Glenn in the first manned satellite to orbit the earth. Undergirding and enabling these astronautic feats, was an extensive international network of earth stations much lesser known.

4. Conclusion

So what can be gained from this nodal study of an earth station in Zanzibar? By highlighting material conditions and political struggles that emerged during this earth station's development in Zanzibar, I hope to complicate the reductive iconographies of network cartographies, which, through their very production and circulation, imply that the visualized infrastructure had full authority to be

Development: 14.D Satellite Tracking Stations: 25. Zanzibar Project Mercury RG 59, General Records of the Department of State, National Archives.

⁵³ Ibid.

⁵⁴ On October 5, 1960, there was a traffic accident involving African Zanzibari men who worked for W. C. French and Co. (subcontractors to Burns & Roe). A local bus crashed into a truck that was carrying workers to the Mercury site and killed 3 men and injured 4. See Letter to Kerrigan from Campbell, Oct. 6, 1960, Folder 1960, 14. Scientific Research & Development: 14.D Satellite Tracking Stations: 25. Zanzibar Project Mercury RG 59, General Records of the Department of State, National Archives.

put in place. While the Mercury station in Zanzibar had the legal permission of the British colonial administration, the historical process of its installation was much more fraught and complicated. The situation of the Mercury station in Zanzibar prompts consideration of what it means to build and operationalize a network node that was built against peoples' will. Because I have examined only US archival records so far, my recounting of Zanzibari opposition to the Mercury station is filtered through the perspectives of US agencies and representatives. Further research could examine literature of the ZNP and press accounts of the station's development in Swahili and Arabic languages and could include oral histories in those languages as well. It would also be helpful to further examine Russian and Chinese commentaries about the Mercury station in Zanzibar to further modulate and contextualize US accounts of »bloc propaganda.«

While this additional research would certainly expand understandings of local and international perspectives on the project Mercury station in Zanzibar, a broader goal of this article is to make a case for experimental, multimodal methods that combine archaeological, archival, and phenomenological approaches. What kinds of network histories emerge if they are based on state, corporate, and/or regulatory records alone? If I were to use a strictly archival approach based on the US records that I gathered, my historical analysis of this station's development might be overdetermined by the perspectives of state officials and Cold War logics. Visiting the site and experiencing it as forgotten global network node, overtaken by Zanzibari farmers, compelled me to try and historicize it through a more open palimpsest, and to imagine a broader repertoire of agencies and positions for whom this node may have mattered. Being at the site's ruins, in other words, helped me to consider historical alterities in Tunguu and beyond, at other Project Mercury earth stations in Woomera, Kanton Island, Bermuda, the Canary Islands, and Kano, Nigeria, even if they remain inaccessible and unknown to me. A nodal approach not only involves complicating the intelligibility and efficiency of the network map and its agents; it is also about confronting the limits and paradox of the node: the moment one tries to »narrow the focus,« get »site-specific,« or »localize,« a jumble of vital questions and contradictions emerge to occlude and confound the view.

Given the forces of anti-militarization, neo- and anti-colonialism, and Cold War geopolitics that shaped the development of the Mercury station in Zanzibar, I conceptualize this site as a *contrapuntal node* rather than as a »global meets local« formation.⁵⁵ In his study of the French rocket launch complex in Hammaguir,

⁵⁵ For a related discussion see N. Castree, D. Featherstone, & A. Herod: *Contrapuntal geographies: the politics of organizing across sociospatial difference*, in K. Cox, M. Low & J. Robinson (eds.): *The SAGE Handbook of Political Geography*, London 2008, pp. 305–321.

Algeria (1947–67), Asif Siddiqi uses heuristics of »site« and »scale« to challenge normative histories of the space age and reductive approaches to the »global« and »local« that often equate the global with Western science and the local with indigent populations. He insists that such »sites« of the space age were not only involved in establishing certain technologies, but also reorganized material conditions at different »scales,« from everyday social relations to the molecular chemistry of the atmosphere.⁵⁶ To challenge the normative history of the space age in another way, I have foregrounded Zanzibaris' role in Project Mercury, recognizing both their opposition and contributions to it. Such conditions, I argue, mark this site as *contrapuntal node* within Mercury's »worldwide tracking network,« as they signal the clashing forces and hybrid cultures that formed around the installation's construction as well as efforts to »undo« it. A contrapuntal node is one whose development is contested by those who live in its vicinity. Throughout all phases of the Mercury station's development, some Zanzibaris were ardently opposed and wanted it removed. Their political desire was gratified after Zanzibar's revolution. One of the first things the new President, Amani Abeid Karume, did after seizing power on January 12, 1964, was to demand Project Mercury staff leave the island. He also ordered the station be shut down by the end of April 1964.⁵⁷

Even though the Zanzibar station was shut down, the role of this node in the first global real-time computing network provokes critical reflection about the continuities that exist between facilities such as satellite earth stations and data centers of the internet era. With the globalization of satellite- and internet-based communication, networked ground stations and data centers now abound across the planet. An interdisciplinary field of data center studies seems to have formed overnight. This new research area is essential and exciting. It is my hope that data center specialists will keep precursor facilities such as satellite earth stations and non-Western nodes in mind. Since much of the data center research so far has focused on energy efficient siting of facilities in Northern Europe, where temperatures are cooler, I wonder whether data centers and workers in the southern hemisphere, including in sub-Saharan Africa, will be eclipsed in new network histories and critical conceptualizations. Though the Mercury earth station was an entirely different technical entity, it (and its interlinked others) could be perceived as pit stops in data center archaeology since their function was to gather, store, and network telemetry and tracking data. An archaeological approach would entail querying and historicizing the very definition of »data center« and setting out to specify and analyze its diverse materializations across time/space rather than

⁵⁶ Asif Siddiqi: *Another Space: Global Science and the Cosmic Detritus of the Cold War*, in: Pedro Ignacio Alonso (ed.): *Space Race Archaeologies*, Berlin 2016, pp. 34–35.

⁵⁷ Smith: *U.S. Will Remove Zanzibar Station* (as note 3).

reify its figuration as »central« or »novel.« Will the historical narratives around the data center be dominated by familiar tropes of speed and efficiency, centers and peripheries? Or are there other rubrics through which to excavate and register its multiplicities and contrapuntal forces?

Whatever the case, a nodal approach to network history—whether an earth station or data center—is faced with the problematic of how to treat the one vs. the many. What do we gain from drilling down into one network node as opposed to exploring dynamic interconnections and relations between and across them? Which networks and nodes are worth investigating and historicizing, and why? What methods are most helpful in shaping the ways we conceptualize networks and their complex materialities? My interest has been to explore sites and socio-technical relations on the outskirts of industrial power, and, in the process, to unlearn and rethink how technologized communication, media cultures, and power relations take shape. This approach is not intended to relish in the obscure or the exotic; rather, it is an attempt to try to understand the heterogeneous sites and peoples that have innovated, built, and used technologies of communication and to contest the solidities and affordances that congeal in institutionalized and already recognized sites of power. At a minimum, Zanzibar's opposition to the Mercury earth station encourages us to consider that countless nodes in the networks we have come to rely on each day possibly have been installed against peoples' will. Excavating the materialities of other contrapuntal nodes begins to complicate contemporary network histories that privilege visions of a »closed world« or »control society« by bringing to the fore people who sought something other.