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International Space Station

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HoMMUNC XXXVIII

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Letter From the Secretariat

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Dear Delegates,

It is our pleasure to welcome you to Horace Mann's 38th Annual Model United Nations Conference, HoMMUNC XXXVIII! Since 1985, HoMMUNC has brought together future world leaders to discuss pressing global issues. We hope that this day can be full of meaningful and didactic debate, discourse, and collaboration. We are honored to be able to organize this conference for all of you, and hopefully provide you with an enjoyable Model UN experience. We hope you are as excited as we are!

We encourage you to deeply explore your topics and arrive at HoMMUNC prepared to engage with others and involve yourself in debate, regardless of your age or experience with Model UN. Each committee is composed of a diverse group of delegates and will address a unique set of topics ranging from protecting freedom of the press to the weaponization of smallpox and the preservation of indigenous culture. We challenge you to delve deep into research and think creatively about how to address these complicated issues. Take this opportunity to learn as much as you can, work collaboratively, and be a leader in your committee.

Model United Nations has played a massive role in our lives over the past three years, and we are thrilled to share it with all of you. It has been our pleasure preparing HoMMUNC XXXVIII along with our dedicated junior and senior staff over the past six months. We hope you have an enriching and enjoyable experience at the conference!

Sincerely,
Nate Chiang and Lily Wender
Secretaries-General of HoMMUNC XXXVIII

Committee Procedure and Background Information:

Committee Background

This committee is a collection of astronauts and cosmonauts from a variety of nations, as well as international space agencies and other important players in the space arena who will be tasked with addressing the loss of communications between the ground and the International Space Station while also solving acute problems faced by the ISS while and attempting to achieve their nations or their personal objectives. It is currently February 16th, 2028. Expedition 78, composed of 12 astronauts from the US, Russia, Japan, Canada, Switzerland, the UK, and Australia, is currently onboard the International Space Station. At the same time, members of mission control, space agencies, and private space companies are gathered at the Lyndon B. Johnson Space Center in Houston, Texas where NASA's Mission Control Center is also located.

Committee Procedure

The International Space Station Committee will largely follow standard crisis committee procedure, with delegates being able to pass four types of legislation: directives, crisis notes, communiques, and press releases. The details of that procedure will be laid out in the coming sections. However, one notable aspect will be different in this committee. Due to the premise of the ISS losing communication with ground control, delegates in the ISS and ground sections will begin the committee separately and will only be able to reconnect the two portions of the committee when they determine a way to reestablish a connection. This means the committee will effectively start out as a mini JCC before becoming an ordinary crisis committee should communication be established. It is also important to note that all information within this background

guide relating to the 2023-2028 time period is fictional and only loosely based on available plans.

Notably, because this is a crisis committee backroom (crisis notes, communiques, etc.) are a major consideration in our assessment of your committee performance. Thus, we advise that your preparation is not exclusively devoted to preparing ideas for directives but also involved developing a plan for your crisis arc.

Debate Format: As this committee is a crisis simulation, we will enter and remain in a series of moderated and unmoderated caucuses. Once our simulation begins, delegates will be strongly encouraged to motion for either type of caucus. A moderated caucus is a form of debate that allows delegates to express their position on a topic, respond to a crisis update, or suggest possible solutions for an issue within a speech. When motioning for a moderated caucus, delegates need to specify a topic for debate (this topic can range from "addressing the most recent crisis update" to "long term solutions"), individual speaking time, and the length of the moderated caucus. One example for a moderated caucus could be "six minutes, 45 second speaking time on the topic of the Iran-Iraq border". Round-robins are another version of a moderated caucus, but they guarantee that each delegate has a chance to speak, as the speaking order goes either clockwise or counterclockwise around the room and each delegate is encouraged but not required to make a speech. Additionally, the individual who motioned for the moderated caucus has the option to either speak first or last. Unmoderated caucuses are another fundamental component of a crisis committee. They are brief periods of unstructured discussion between delegates without designated speaking times. Though it can be easy to confuse "unmods" with breaks, delegates who use them wisely and collaborate with fellow committee members to produce

legislation will be much more successful throughout this conference. To motion for an unmod, delegates should say something along the lines of, “10 minute unmoderated caucus.” Unmods can also be utilized as a valuable time period in which delegates can converse and either draft or merge directives. Note that delegates should not motion for any speaking time or specific topic, remember unmods are unstructured. Multiple motions will be considered and voted on in order of most to least disruptive.

Crisis Updates: Throughout the conference, the crisis staff will provide the committee with crisis updates. These updates include information about what is going on in the “world” outside of the committee room. Updates are produced by delegates’ actions in crisis notes or directives. Delegates should be aware that even the best laid and most detailed plans (in crisis notes) may be turned on their head if they are revealed in an update. Example Crisis Update: “BBC News Update: An attack on the Embassy of Ukraine in London has been linked to the Solntsevskaya Bratva of the Russian Federation. The assault of the building has left 4 people dead and 26 injured. This is not the first report of Russian gang activity outside of Russia, and attacks like this one are becoming more and more frequent. NATO is pressuring Interpol to recognize Russian Organized Crime as the threat to the free world that it is.”

Directives: Directives are one type of legislation in a crisis committee and they use the power of the whole committee to resolve challenges posed by crisis updates. Directives should be titled (be creative) and include a list of sponsors & signatories. Sponsors are generally those who have contributed most to the directive, while signatories are those who stand with the directive or wish to see it presented. The chairs will specify at the beginning of the committee the minimum sponsors and signatories per directive. Multiple delegates write and sponsor directives,

as they are the most common and the most impactful type of legislation. Although directives should be written in clause format, unlike the resolutions of General Assembly committees, operative clauses should include actionable words; some examples of these words include, “releases, requests, establishes, creates,” or “ceases” and preambulatory clauses are not neccessary. Additionally, because the committee will pass multiple directives during a single session, most often as responses to crisis updates, directives are shorter than General Assemblies’ longer resolutions. Directives need a simple majority to be passed, and the dais will determine the exact number of signatories and sponsors each directive needs at the beginning of the conference. Delegates can motion for presentation of directives for a variety of time periods, with or without a Q&A period. Subsequently directives can be voted on. If delegates decide that they support part of a directive but not the entire piece of legislation they may motion to “divide the question.” Dividing the question separates a clause or subclause from the directive as a whole and allows the committee to vote on each new section separately. Delegates should strongly consider dividing the question if they agree with most (or a substantial portion of) a directive so the committee is able to effectively pass legislation. Example Directive: (A randomized topic and committee) Preparing for war!
Sponsors: Benjamin Franklin, Alexander Hamilton, Thomas Jefferson, John Adams
Signatories: John Jay, Samuel Adams, Peyton Randolph, James Kinsey

1. Creates the Continental Army using existing Boston Militias. In order to organize said army,
    1. Take inventory of all existing arms and resources
    2. Give command of the army to George Washington
    3. Appoint generals and other military officials

2. Requests all states to provide troops to supplement the existing Continental Army
3. Appoints Benjamin Franklin as the ambassador to France to fulfill diplomatic duties. He will;
    1. Negotiate military treaties in order to have French soldiers train and supplement the newly created Continental Army
    2. Request funds in order to pay for the Revolutionary War

Communiques: Delegates can address people, entities, and other organizations that are not part of the committee through communiques, which are written by multiple delegates but are not voted on by the committee. Communiques allow delegates to ask for meetings with outside organizations or individuals, specific information, or materials or resources. For example, members of the Security Council could request a meeting with Saddam Hussein. Delegates should remember that every request must be realistic with regards to your character's portfolio powers. It is also critical that each communique is written as a formal letter and is as specific as possible. If your letter lacks specifics, the dais may refuse your request or even turn it against you, potentially jeopardizing your plans and your position in the committee.

Press Releases: Press releases are ways for the whole committee to express sentiments and provide information to people who are not members of the committee (i.e. the public). Presented and debated in the same way as directives, press releases will need the same number of sponsors and signatories as directives. Once again, the number of sponsors and signatories will be determined by the dais. Delegates should remember that press releases are much less impactful than directives, communiques, and crisis notes. Generally, most press releases do little to substantially alter the flow of committee.

Portfolio Powers: Portfolio powers are the powers that accompany the country you represent. One example of this is the delegate of the Philippines ordering the Filipino army to invade a part of Kashmir. Another example can be the delegate of Ukraine relocating a part of their Horace Mann Model United Nations Conference 8 military supplies to Pakistan. Every delegate will be representing a different country, therefore your motivations for using your country's resources will be different.

Crisis Notes: Crisis notes, also known as personal directives, are a critical component of a crisis simulation. They allow delegates to use their portfolio powers to direct the committee and advance individual agendas. A two pad system will be used to manage crisis notes in this committee, allowing delegates to work on their notes while the crisis staff responds. Although crisis notes do not need to be written in clause format (like directives) they should be both clear and detailed. It is important to remember that the more specific one's crisis notes are, the more easily they will be understood by the dais and the more successful your crisis arc will be. Additionally, crisis notes will only be accepted if they properly utilize a delegate's individual portfolio powers. Often delegates with less experience will attempt large, unprecedented, and sometimes outrageous actions in a single crisis note. For example, suppose a delegate is on the United Nations Security Council during the Cuban Missile Crisis as a representative from the United Kingdom. This delegate, in a single crisis note, orders the British Royal Navy to seize Cuba. Delegates in this committee, and during future conferences, should not do this. A note like the one just described will not be accepted by the chair since it lacks specific details and does not fit into the nation's overall agenda. Instead, delegates should take smaller steps

over time to prepare for a larger or more extreme action. An example of this would be to send a series of notes during the first committee session that do the following: organize a complete review of the British Navy, special operations forces, and direct MI6 to create a strategy for seizing important Cuban ports; coordinate with the United States intelligence community and organize a joint military exercise in the Caribbean; position necessary military forces in the area; using diplomatic backchannels find a top Cuban military general/leader who is willing to attempt a coup; gather information on Castro's military forces in Cuba and adjust the takeover strategy accordingly; reach out to contacts in P5 nations and try and determine if they have asset's in Cuba or are considering unilateral military action against the island, this could provide the UK with leverage. Then the UK might be ready to occupy Cuba. But remember, an action like this is huge and unless executed seamlessly it will not go according to plan. Crisis notes are the most personally powerful and dangerous piece of legislation in committee. Good crisis notes should direct the flow of the committee in a direction that benefits oneself and the whole committee as well. Before sending a note, make sure this is in the character of your delegate. Crisis notes do not have to be voted on by the entire committee, as they are unilateral. If delegates decide that it is in either their own or the committee's best interest, two or more delegates may collaborate to use their portfolio powers to write a joint crisis note. It is extremely important to note that crisis notes and arcs make up a large share of the committee and thus well planned and detailed notes are an essential consideration in awards.

Topic: International Cooperation In Space

Overview

The International Space Station has been continually occupied by humans for over 22 years, the longest continuous human presence in space, and is operated by a partnership between five space agencies, the US's NASA, Russia's Roscosmos, Japan's JAXA, Europe's ESA, and Canada's CSA. The station has a modular design, with partner agencies contributing various parts of the structure. One of the primary purposes of the ISS is scientific research. To that end, it contains six lab modules that have been home to over 3000 experiments. A notable experiment is the Alpha Magnetic Spectrometer (AMS), which detects dark matter in order to help scientists understand more about our universe. There have also been important studies done on the effects of microgravity and spaceflight on the human body which will have a large impact on the future of space travel and other studies have illuminated important information about the physiology of diseases like Alzheimer's and Parkinson's. Another major goal of the ISS is to provide education about space to students across the world and many of the partner nations have developed films and videos to provide education based on the work of the ISS. An original objective of the ISS was to provide a base for future missions to the Moon, Mars, and the outer solar system, although this has largely failed to be implemented.

As of the time of this committee, 2028, the International Space Station is seeing a number of challenges emerge to its future operations. First is the involvement of Russia. In 2022 during the aftermath of the Russian invasion of Ukraine and subsequent international sanctions, Russia announced plans to pull out of the ISS by 2024 in order to pursue a separate low Earth orbit space station.

However, this plan was quickly reversed with Russia committing to continue participation in the ISS. Despite this, there were still issues around Russia's involvement as two cosmonauts aboard the ISS shared images holding the flags of the Luhansk People's Republic and the Donetsk People's Republic, two Russian-backed separatist territories in Ukraine. The image, which included the commander of the ISS, prompted backlash from many including former ISS commander Terry Virts, who said, "I am incredibly disappointed to see cosmonauts and Roscosmos using the International Space Station as a platform to promote their illegal and immoral war, where civilians are being killed every day." At the same time, leader of Roscosmos, Dmitry Rogozin expressed the sentiment that "the restoration of normal relations between partners in the International Space Station and other joint projects is possible only with the complete and unconditional lifting of illegal sanctions." This increase in tensions has been felt primarily by crews, with some expeditions between 2024-2028 successfully operating by choosing to focus on their work rather than politics and conflict, however, other groups were marred by fighting which sometimes delayed work and created a negative environment. Overall, the Russia-Ukraine war put a significant strain on the work of the ISS, leading to less communication between partners and preventing seamless collaboration.

The ISS is also currently facing an existential threat—funding and privatization. While concerns around Russia's departure from the ISS led to worries about funding, Russia eventually committed to ISS involvement through 2028 and later 2030, in accordance with Canada, Japan, and Europe However, it is still unclear what the future holds for the ISS with nationals failing to extend their commitments for further involvement in the project as they

begin to shift the focus on their space programs towards new horizons. In hopes of focusing on longer-term Moon and Mars goals, NASA is beginning to fund the development of private LEO station concepts which are also known as commercial LEO destinations (CLDs), potentially in the hopes of replacing the ISS with one. NASA has already begun outsourcing transportation for astronauts to and from the ISS to companies like SpaceX and Boeing, and Axiom Space has been involved in bringing paying astronauts onto the ISS. A major reason for this shift has been monetary, as NASA hopes to reduce the approximately $3 billion it spends annually on the ISS and other nations do the same. The involvement of these private companies begs the question, will space, and especially LEO stations, continue to be an arena of governments and international collaboration or will it become another frontier for capitalism and private companies? Jonathan McDowell, an astronomer at the Harvard and Smithsonian Centre for Astrophysics in the US, says "I am really skeptical of the business cases there, I'm just not convinced that you can run a profitable space station," presenting a possible issue with shifting the essential LEO station sector to private companies However, the NASA proposal for international collaboration on a Lunar Gateway Station near the moon and Russia's eagerness to pursue a separate station project without international collaboration seems to convey a shift in the international space community away from the ISS. However, there are some proposals to continue ISS operations in a different manner, potentially via a private company, a collaboration of different nations or at least reusing the modules for other space projects. One key topic for this committee to address will be the future role of the ISS and whether large-scale international collaborations in space are going to continue in the future.

History

When the crew of Expedition-1, American astronaut William Shepherd and two Russian cosmonauts, arrived at the ISS on November 2nd, 2000, it was not just the beginning of a new era in the spacefaring missions of humanity, but also the culmination of decades of work. Many scholars trace the birth of the modern conception of a space station to Edward Everett Hale's 1869 work *The Brick Moon*, however, the first space station was not built until 1971, when Salyut 1 was launched by the Soviet Union. Salyut 1's first mission ended in a tragedy when a pressure valve malfunctioned during the crew's return to Earth, rapidly depressurization the cabin and killing all of the cosmonauts onboard. Notably, these were the only humans to ever die in space rather than on launch or reentry. Not only did this failure prompt numerous attempts by the Soviets to improve upon the idea, which would eventually lead to the launch of Mir, the first multi-modular space station, but it also inspired the US to get involved in the space station arena.

In the aftermath of achieving President John F. Kennedy's goal of sending men to the moon in 1969, the focus within NASA began to shift to a new project, namely building its own space station. Skylab, which was in operation between 1973 and 1974 and staffed by three different crews of astronauts, was primarily, as the name implies, a venue for scientific research and experimentation. On board, there were solar observatories, Earth observatories, medical labs, and microgravity labs, all of which would allow scientists to broaden our understanding of outer space. Most notable, however, was the technology developed to facilitate long-term living in a microgravity environment, including a functional shower, toilet, and kitchen, which would be instrumental in future space station missions. While there were small issues with a meteoroid shield coming

loose and damaging solar panels, leading to reduced power onboard and thruster leaks complicating rendezvous efforts, astronauts were able to overcome these obstacles and Skylab was largely successful.

Up until this point, space had been a solitary arena and effectively a messaging and technology-focused front of the Cold War, where the USSR and the US could flex their prowess and compete. This would change in 1975 with the Apollo-Soyuz Test Project, the first international human space flight. An American Apollo craft and a Soviet Soyuz would dock for 44 hours, allowing astronauts to eat together, complete collaborative experiments, and share culture and serve as a powerful symbol of détente, or the relaxation of tensions during this portion of the Cold War. Astronauts involved would later describe how this mission humanized their Soviet counterparts, whom they had previously viewed as monsters, and allowed them to see a path toward peace. Notably, one of the other purposes of the mission was to test the possibility of docking between US and USSR spacecraft should it become necessary in an emergency situation, another indicator of the tentative collaboration that arose during this period.

In the aftermath of the successful Apollo-Soyuz Test Project the US and USSR began contemplating other ways to collaborate in space with a focus on space station technology. Ideas included using the backup Skylab B to create the International Skylab and docking Skylab B with a Salyut USSR space station to form the Skylab-Salyut Space Laboratory. However, increasing tensions between the nations during the 1970s and budgetary issues within the space agencies led both of these proposals to fail.

Instead, the USSR launched the Mir space station, which was the first modular space station and the largest one at the time. It was launched

on February 20, 1986, and would be in use for 14 years. Notably, scientific studies onboard Mir focused primarily on studying the Earth from space, analyzing both environmental and ecological information. Concurrent with the Soviet development of Mir, American President Ronald Reagan announced his intention to build the Space Station Freedom. He intended to create a modular space station to rival Mir and turned to the European Space Agency (ESA) in 1984 for collaboration. They agreed to participate via the Columbus laboratory in 1987. The Japanese Aerospace Exploration Agency (JAXA), also became involved in the project with the Japanese Experiment Module (JEM) in 1985. However, difficulties soon arose when Congress refused to provide the funding necessary for Freedom, urging NASA to seek out other international partners who could help reduce the costs.

In order to solve their problem NASA sought help from Russia, which was struggling to finance the costs of Mir-2 in the aftermath of the collapse of the Soviet Union. The two nations were able to reconcile their differences to some degree for the sake of their space stations, and in September 1993 their plans for the project which would come to be known as the International Space Station were announced. In the period before the full implementation of the ISS, the US, and Russia partnered on the five-year Shuttle-Mir program, in which eleven different Space Shuttle missions allowed American astronauts to visit the Russian Mir space station. Additionally, Americans and Russians participated in a joint flight on the Russian Soyuz spacecraft.

In 1998 preparations for the ISS to be implemented began to be finalized, as the fifteen participating governments signed the Space Station Intergovernmental Agreement (IGA). The nations involved were the Russian Federation, the United States, Canada, Japan, and eleven Member States of

the European Space Agency (Belgium, Denmark, France, Germany, Italy, The Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom). The goal of the document is, according to Article 1, to establish "a long term international co-operative frame-work on the basis of genuine partnership, for the detailed design, development, operation, and utilisation of a permanently inhabited civil Space Station for peaceful purposes, in accordance with international law." As the manager of the ISS, NASA was in charge of creating bilateral Memorandas of Understanding (MOUs) with the ESA, Roskosmos, the Canadian Space Agency (CSA), and JAXA.

Once the framework was established, the first ISS segment was able to be launched in 1998. The first module was Russian and was known as the Zarya Control Module, which provided fuel storage, battery power, and rendezvous and docking capabilities that would allow it to connect to Soyuz and Progress spacecraft. A month later, the US would launch its first contribution to the ISS, Unity Node 1, which was to be a part of the laboratory onboard. Over the next two years, the ISS was gradually assembled. The first human crew arrived on the ISS in 2000 and was composed of one American astronaut and two cosmonauts, who worked to activate the systems onboard, host three visiting Space Shuttle crews, and manage Russian Progress resupply missions during their 136 days on board. Notably, during this mission, the Destiny research module, which would make the ISS the biggest space station in history and increase living space by 41%, was delivered. In 2008 the European and Japanese labs were delivered, becoming important parts of the ISS and allowing for more scientific research to be performed.

One important thing to note about the function of the ISS is that not only is the station constructed of international components, but the

crews are also filled with a diverse set of astronauts. While there is some overlap between expeditions when astronauts remain on the station for longer than their colleagues, generally each expedition brings a fleet of new astronauts. Notably, the first 12 expeditions were composed exclusively of American and Russian astronauts, with the first ESA astronaut, German Thomas Reiter, being a part of the 13th mission. The first JAXA astronaut was Koichi Wakata, who was a part of Expedition 18 and the first CSA astronaut was Robert Thirsk, who participated in the 20th expedition. As of 2023, 269 people have visited the ISS in total, including 163 Americans, 57 Russians, 11 Japanese, 9 Canadians, 5 Italians, 4 French, 4 Germans, and one or two astronauts from nations such as the UAE, Saudi Arabia, Brazil, Israel, Kazakhstan, Malaysia, South Africa, and South Korea. The ISS is one of the most stunning examples of international collaboration in which nations have been able to put aside their differences in pursuit of scientific advancement, however maintaining it will not be without its challenges.

Current Situation

Communication between the International Space Station and ground-based mission control has been completely lost for the first time in International Space Station history. The three American ground stations, the Russian Mission Control Center, and the European Control Center are now no longer receiving the expected communication from the astronauts onboard the International Space Station. While it is unclear what the precise problem is preventing communication with the ISS, it is notable that communication seems to have been restored for a few brief moments when the station was orbiting precisely over Russian mission control.

Since long before the ISS was in use, the Tracking and Data Relay Satellites (TDRS) have been the crux

of communication between NASA Mission Control and various spacecraft. One portion of the TDRS system is the ground stations, which are located at the White Sands Complex (WSC) in New Mexico, the Guam Remote Ground Terminal (GRGT), and the Network Control Center at NASA's Goddard Space Flight Center in Maryland. These stations are able to collect communications and provide command and control services as needed. The second segment of the program is the space segment, composed of three primarily satellites and six on-orbit spares. These are divided into three regions, the Indian Ocean, the Pacific Ocean, and the Atlantic Ocean. These satellites occupy geosynchronous orbit, approximately 36,000 km from the surface of Earth. They use three different frequencies of radio waves, S-band, Ku-band, and Ka-band to relay information between the ISS and ground stations through uplinks, sharing data from the ground to a spacecraft, and downlinks when data flows in the opposite direction. The TDRS is essential because without a relay device satellites and space stations are only able to communicate with the ground station when they have a clear view. Notably, while communication is nearly instantaneous when the ISS is within range of a ground station, should the ISS be further from a station necessitating the usage of TDRS, communication can be delayed by multiple seconds, causing inconvenience and potential harm in emergency situations. This system is replicated by the other two space agencies directly involved in communication with the ISS. Roscocosmos utilizes the Luch satellite system, composed of the Luch-5V, Luch-5B, and Luch-5A, which are each stationed over one of the Indian, Atlantic, or Pacific Oceans. Similar to TDRS, Luch uses S-band and Ku-band channels for communication between the ISS and the Russian Mission Control Center in Moscow. The

European Space Agency uses the European Data Relay System (EDRS) and Ka-band to achieve the same objective of communicating with its Columbus Control Center in Germany.

The brief restoration of communications appears to be because of the Russian Lira antenna mounted on the Zvezda module, which was used at the beginning of the ISS to support communication directly between the station and Russian ground control without any satellite relay being necessary. However, due to limited instances of the ISS passing within range of the ground station, it is unclear whether this connection will recur and allow for further communication.

Situation Onboard

When communications from various ground control stations were abruptly lost approximately 24 hours ago, the astronauts onboard initially believed that the disruption was only a short-term glitch and that the connection would be restored shortly. However, as communications failed to materialize, tensions and fears among astronauts have grown. Astronauts are currently focused on attempting to understand the blip when communication was restored and are working to monitor communications systems onboard the station in order to determine whether the issue originates from their technology. Possible next steps they are considering include performing spacewalks investigating whether sensors are potentially blocked or damaged, exploring the potential of activating other forms of communication with Earth and simply waiting to see what ground control will do to solve the problem. An additional option that some of the astronauts have begun to consider is to utilize the SpaceX Dragon capsules that brought the astronauts to the ISS for an emergency escape, however, this would be difficult if not impossible without assistance from ground support.

Situation On The Ground

When the first issues with communication were discovered approximately 24 hours ago, members of the ground portion of the committee were quickly called to gather at NASA's Mission Control Center in Houston, and currently, the meeting between relevant partners is about to start. Currently, information about communications issues has been able to be kept confidential and secret due to worries about alarming the public or appearing weak to the international community. At the same time, it will likely not be possible to keep the issues a secret forever as family members of astronauts will likely grow suspicious due to a lack of communication and the press is likely to catch on to the gathering of experts eventually. The ground portion of this committee has one primary objective: to restore communications with the International Space Station as quickly as possible. To this end, it will likely be necessary to develop an understanding of not only how communications were severed but also who took this action and for what purpose. Additionally, the committee must ensure they do not appear weak to foreign adversaries or their people in order to prevent further conflict from arising.

Questions to Consider

1. How can steady and reliable communication be restored between astronauts on the International Space Station and ground control stations?
2. What specifically caused communication to be lost? Was it a mechanical failure or was it caused by a malicious actor?
3. How can these communication issues be prevented in the future and how can better backup and emergency systems be created?
4. Is there a long-term future for the international collaborative operation of the ISS? Should one

nation take over full control?

Should it be privatized?

DOSSIER

On the International Space Station:

Reid Wiseman, NASA: Wiseman is the commander of Expedition 78 and an experienced astronaut. Before joining NASA he was a fighter pilot in the Navy where he was deployed to South America and the Middle East. At the beginning of his NASA career, he served as Flight Engineer on the ISS for 165 days, completing over 300 scientific experiments and setting a station record for most research in a week. Next, he served as Chief of the Astronaut Office at NASA, the highest position for an active astronaut, although he later gave up the position to participate in the Artemis II program. He was the mission commander for the program, which successfully brought four astronauts around the Moon as a step towards rebuilding NASA's lunar capabilities. As commander of the expedition, he is not only in charge of the mission as a whole but he is also the one that people turn to during times of uncertainty.

Sunita Williams, NASA: Williams served in the Navy in various roles prior to her work with NASA, including as a Naval Aviator for Operation Desert Shield and Operation Provide Comfort, as the Officer-in-Charge of a detachment to send relief to Miami, Florida in the aftermath of Hurricane Andrew and as an instructor at Naval Test Pilot School. She was a member of ISS Expeditions 14 and 15, the flight engineer on Expedition 32, and commander of Expedition 33. She was also a part of the Boeing Crewed Flight Test, the first crewed mission of the Boeing Starliner, in 2025.

Zena Cardman, NASA: Cardman holds a BS in Biology and a Master's of Marine Sciences from the University of North Carolina Chapel Hill, with her research focusing on subsurface environments like caves and deep-sea sediments, where she monitors

biological and chemical cycling. She has worked with the Palmer Long-Term Ecological Research group in Antarctica and NASA researchers to develop strategies for science-based extravehicular activity in a variety of environments. She has worked on the Biologic Analog Science Associated with Lava Terrains NASA program, which works to develop vehicles for Mars. Expedition 78 was her first experience in space.

Colonel Andrew R. Morgan, NASA: Morgan earned his BS in Environmental Engineering at West Point and later earned his Doctorate in Medicine. He was a member of the Army special operations community, serving as the Battalion Surgeon for the 1st Battalion, 3rd Special Forces Group (Airborne) “Desert Eagles.” He has been deployed in Africa, Iraq, and Afghanistan and is rated as an Army master flight surgeon and special operations diving medical officer. He has served as the flight engineer on the ISS for Expeditions 60, 61, and 62 and was a member of missions 72 and 73.

Loral O'Hara, NASA: Loral O'Hara is a talented NASA astronaut known for her dedication to exploration. Born in 1983, she completed her Bachelor's and Master's degrees in Aeronautics and Astronautics at Purdue University before joining NASA in 2017. Loral's background in engineering and her enthusiasm for space science make her a valuable asset to NASA's future missions. She's passionate about studying lunar geology and plans to contribute to NASA's Artemis program, aiming to return humans to the Moon by the mid-2020s.

Konstantin Borisov, Roscosmos: Borisov received his Bachelor’s in Economics from the Russian Academy of Economics before receiving his Master’s in Operations Research and Systems Analysis at Warwick University in the UK. He studied Program Life Support Systems at the

Moscow Aviation Institute and served as the flight engineer on SpaceX Crew-7 (Expeditions 69 and 70) and Expedition 75.

Anna Kikina, Roscosmos: Anna Kikina, born in 1984, is a Russian cosmonaut who joined the Russian space program in 2012. She has a background in aviation and engineering and has been involved in various space training and research activities. Anna's dedication to space exploration is evident in her career, and she continues to be an active participant in Russia's space missions and research efforts.

Andrey Fedyaev, Roscosmos: Fedyaev studied air transport engineering at the Balashov Military Aviation School and after graduation joined the Russian Air Force, logging over 500 flight hours and reaching the rank of major. He flew on SpaceX Crew-6 as a part of a crew swap agreement with NASA.

Harutyun Kiviryan, Roscosmos: Kiviryan is of Armenian heritage and studied engineering with a specialty in rockets at the Baltic State Technical University in Saint Petersburg. He has worked as an engineer at RSC Energic, the largest contractor for Roscomos' crewed spacecraft. His involvement in Expedition 78 marked his first foray into space.

Sergey Revin, Roscosmos: Sergey Revin, born in 1966, is a Russian cosmonaut with a strong background in engineering. He joined the Russian space program in 1996 and flew to the ISS as a flight engineer in 2012. Sergey's expertise in technical systems and his dedication to space exploration make him a valuable member of the Russian space agency, Roscosmos. He continues to contribute to Russia's ongoing space missions and research efforts.

Matthias Maurer, ESA: Matthias Maurer is a European Space Agency

(ESA) astronaut born in 1970. He has a background in materials science and engineering, holding a Ph.D. in Material Science and working as an engineer in various capacities before joining ESA in 2015. Matthias completed his astronaut training and is now actively preparing for space missions. He represents Germany's commitment to space exploration and plays a crucial role in ESA's missions, including research on the ISS.

Marco Alain Sieber, ESA: Sieber is a Swiss national, having studied at the Gymnasium Burgdorf in Switzerland before serving as a paratrooper with the Swiss Special Forces Commando in the Swiss Army. He reached the rank of Sergeant in this position before leaving to receive a Doctor of Medicine at the University of Bern. His thesis focused on utilizing robots to perform surgery and he also earned a specialist diploma in pre-clinical emergency and rescue medicine while working in general surgery and traumatology as an ICU resident. He also worked as a helicopter rescue emergency medical doctor before beginning his work with the ESA. He previously visited the ISS on Expedition 72 and 73.

Rosemary Coogan, ESA: Coogan has a Master's in Physics and one in Astronomy, as well as a doctorate in Astronomy from the University of Sussex in the UK. She has served as a Cadet Petty Officer with the Sea Cadets and as a Midshipman in the Royal Naval Reserves and later worked as a software engineer and research data scientist with a focus on using machine learning for sensor anomaly detection. During her postdoctoral fellowship, she studied galaxies using telescopes and then worked at the French space agency, CNES, where she helped analyze the James Webb Space Telescope observations. Expedition 78 was her first experience at the ISS.

Tim Peake, ESA: Born in 1972, Tim Peake is a British astronaut who made

history by becoming the first official British astronaut to visit the International Space Station (ISS). He joined the European Space Agency (ESA) in 2009 and completed his space mission in 2015. Tim is known for his engaging outreach activities, including educational programs and public engagement through social media. He continues to inspire young generations and actively participates in ESA's efforts to explore space and conduct experiments on the ISS.

Katherine Bennell-Pegg, ESA: Bennell-Pegg was born and raised in Australia and studied as part of the Joint European Master in Space Science and Technology program before serving in the Australian military and earning the prestigious Sir Thomas Blamey Memorial Award. She has experience working at NASA, the ESA, and Airbus and worked as the assistant manager of space capability and later the director of space technology at the Australian Space Agency. She was a member of SpaceX Crew-7 (Expeditions 69 and 70).

Astronaut Soichi Noguchi, JAXA: Soichi Noguchi, born in 1965, is a Japanese astronaut with extensive space experience. He joined the Japan Aerospace Exploration Agency (JAXA) in 1996 and has participated in multiple space missions, including missions to the ISS. Soichi is known for his impressive photography skills, capturing stunning images of Earth from space. He remains an active astronaut, contributing to JAXA's space endeavors.

Ayu Yoneda, JAXA: Yoneda is an experienced surgeon at the Japanese Red Cross Medical Center and a graduate of the University of Tokyo’s School of Medicine. Her primary motivation is to use her knowledge as a doctor to give back to the world and as such her primary focus on the mission thus far has been working on scientific and medical research. She was the third

Japanese woman in space when she arrived as a part of Expedition 78 and hoped to be involved in the planned joint US-Japan lunar surface mission in the future.

Colonel Jeremy Hansen, CSA: Hansen is a fighter pilot from southwestern Ontario who received his BS in Space Science at the Royal Military College in Ontario before completing his Master's in physics. He then served as a cavenaut and aquanaut on the NEEMO 19 undersea exploration mission. In 2025 he was involved in the Artemis II program, a collaboration with NASA that sent astronauts to orbit around the moon as a precursor to further lunar programs.

On the Ground:

Bill Nelson, NASA Administrator: Nelson currently serves as the highest-ranking official within NASA. He majored in political science at Yale and then earned his Juris Doctor from the University of Virginia before enlisting in the Army during the Vietnam War. As a Democrat, he served in the Florida House of Representations, the US House of Representatives, and the US Senate. During his time in the House, he became the second sitting member of Congress to go to space, serving as a payload specialist on Space Shuttle *Columbia*. When he failed to win reelection in the Senate to Rick Scott he was appointed to NASA's advisory council before being nominated for NASA administrator in 2021 by President Biden.

Yury Borisov, Director General of Roscosmos: Borisov studies mathematics at Moscow State University before serving in the Russian armed forces for 20 years. He then became the Deputy Minister of Industry and Trade before being promoted to the Military-Industrial Commissioner for Russia. He then became the Deputy Minister of Defence with a focus on the weapons

industry before replacing Dmitry Rogozin as Director General of Roscosmos. Rogozin was known for speaking rashly in response to Western sanctions and Borisov was largely brought in to return stability and cooperation to the program.

Sergey Krikalev, Executive Director for Human Spaceflight at Roscosmos: Sergey Krikalev, born on August 27, 1958, in Leningrad, Soviet Union (now Saint Petersburg, Russia), is a legendary figure in the world of human spaceflight. He embarked on his academic journey at the Leningrad Mechanical Institute, where he pursued studies in Aerospace Engineering, solidifying his foundation in space sciences. Krikalev's exceptional career includes several spaceflights, including missions to the Mir space station and the International Space Station (ISS). He holds the record for the most cumulative time spent in space by any human, a testament to his dedication to advancing space exploration. In his role as the Executive Director for Human Spaceflight at Roscosmos, Krikalev continues to shape the future of Russian human spaceflight, ensuring the nation's prominence in this challenging arena.

Lisa Campbell, President of the CSA: Campbell received her BA in political science from McGill University before receiving her legal degree at Dalhousie Law School. She worked as a criminal, employment, and constitutional lawyer before becoming Deputy Minister of Defense. She later served as the Associate Deputy Minister for Veterans Affairs Canada. In 2020 she was announced as the president of the CSA, the first woman to hold the role.

Hiroshi Yamakawa, President of JAXA: Yamakawa was born in Switzerland and received his Ph.D. in Aeronautics from the University of Tokyo. He worked as an associate professor at the Institute of Space and

Astronautical Science and JAXA where he focused on mission design, working on the Euro-Japan "BepiColombo" Mercury mission. He was later appointed secretary general of the Secretariat of Strategic Headquarters for Space Policy within the Japanese government then he worked on the Committee for National Space Policy in the Cabinet before being appointed President of JAXA in 2018.

Yasuhiro Morita, Deputy Director of JAXA: Yasuhiro Morita, born on April 12, 1975, is a Japanese aerospace engineer who has played a pivotal role in advancing Japan's space capabilities. Morita's journey began with a Bachelor's degree in Aeronautics and Astronautics from the University of Tokyo, where he demonstrated exceptional aptitude in aerospace engineering. He continued his academic pursuits, earning a Master's degree in the same field, solidifying his expertise. Morita's career path led him to JAXA, where he contributed significantly to mission planning and execution. His notable achievements include his involvement in the Hayabusa2 mission, a groundbreaking mission to retrieve samples from the asteroid Ryugu. His exemplary work has positioned him as the Deputy Director of JAXA, where he continues to push the boundaries of space exploration.

Josef Aschbacher, Director General of ESA: Aschbacher was born in Austria and earned his Master's and Ph.D. in natural sciences. He started his career as a research scientist in Meteorology and Geophysics at the University of Innsbruck before serving in the European Commission Joint Research Center. He worked as Program Coordinator for the Copernicus Program, the ESA's Earth observation component, before being appointed ESA Director of the Earth Observation Programme in 2016. In 2021 he became the Director General of ESA.

Elon Musk, Founder and CEO of SpaceX: Musk was both in South Africa and was involved in numerous entrepreneurial pursuits, including city guide software Zip2 and X.com, which became Paypal, allowing him to acquire wealth. In 2002 he invested $100 million of this money into founding SpaceX. Since then, he has been involved in numerous other projects, including investing in Tesla, founding SolarCity, developing a hyperloop system, co-founding OpenAI, co-founding Neuralink, and purchasing Twitter. Despite his other ventures, SpaceX has been largely successful, implementing a massive fleet of small Starlink satellites that provide internet service and developing a reusable Falcon 9 rocket. It has also become the first private company to send a spacecraft, both manned and unmanned, to the ISS.

Ted Colbert, President and CEO of Boeing Defense, Space & Security: Colbert earned his Bachelor's in Industrial Engineering from Georgia Tech before going on to work as the Chief Information Officer at Boeing, then the CEO of Boeing Global Services, and currently the CEO of the Boeing Defense, Space & Security division. He has also received the Black Engineer of the Year award twice. As CEO he managed multiple portions of the company, including most importantly the Space, Intelligence & Weapon Systems division. This division includes the SLS rocket used for the Artemis II mission around the Moon, which included multiple astronauts on Expedition 78.

Michael T. Suffredini, Founder and CEO of Axiom Space: Suffredini studied aerospace engineering at the University of Texas and then worked at NASA for 30 years, serving as the Assistant Manager of the Space Shuttle

Program and then the International Space Station Program Manager from 2005 to 2015. After that, he founded Axiom with his partner Kam Ghaffarian, which sought to capitalize on the growing private space market. He has sent multiple privately crewed Ax missions to the ISS and received a NASA grant that allowed him to provide the first private module to the ISS which is called the Axiom Segment and contains research and manufacturing capabilities as well as a crew habitat. Should the ISS be decommissioned, Axiom plans to use its existing modules and new ones in order to create Axiom Station, a CLD.

Bob Smith, CEO of Blue Origin: Smith has numerous degrees in business and aerospace engineering from schools including Brown, University of Texas, and MIT and has large amounts of experience in the space sector. He has been the program manager for many Department of Defense and national security programs, he served as the leader of Aerospace's Houston operations, he worked as the Executive Director of the Space Shuttle Upgrades Development Program, and he worked in various positions at Honeywell Aerospace. After that, he became CEO of Blue Origin, which was founded by Amazon's Jeff Bezos in 2000. It launched its first crewed mission in 2021 with Bezos onboard and has some success launching the Vulcan Centaur rocket.

Aarti Holla-Maini, Director of the United Nations Office for Outer Space Affairs: Holla-Maini has served as a member of the World Economic Forum's Global Future Council on Space, Senior Space Policy Adviser to Forum Europe, and an Expert Adviser on Space Traffic Management for European Union before becoming the Secretary-General of the Global Satellite Operators Association and then the Executive Vice-President Sustainability, Policy & Impact at NorthStar Earth & Space. She is

assuming control of UNOOSA, an office of the UN Secretariat tasked with promoting international cooperation in using space for peaceful and scientific goals. It also works to implement international treaties and legal principles related to space.

Richard Branson, Founder of Virgin Galactic: Richard Branson, born on July 18, 1950, in London, England, is a British entrepreneur with a lifelong passion for pushing boundaries. He embarked on his entrepreneurial journey at the age of 18 when he founded "Virgin," a mail-order record retailer. In 1973, Branson took a bold step into the music industry by launching Virgin Records, signing iconic artists like the Rolling Stones and Phil Collins. His venture into the airline industry led to the creation of Virgin Atlantic in 1984. However, his most visionary endeavor is Virgin Galactic, established in 2004, which aims to make commercial space tourism a reality. Branson personally experienced the thrill of space travel on July 11, 2021, when he made a successful suborbital spaceflight aboard Virgin Galactic's VSS Unity, solidifying his commitment to advancing space exploration.

BIBLIOGRAPHY

1. https://www.pbs.org/spacestation/station/research.htm#:~:text=In%20addition%20to%20its%20six,science%2C%20and%20space%20science%20experiments.
2. https://www.nature.com/articles/d41586-020-03085-8
3. https://www.space.com/russia-cosmonauts-ukraine-luhansk-propaganda
4. https://www.space.com/russia-leaving-international-space-station-2024
5. https://www.space.com/russia-stay-international-space-station-partner-2028
6. https://www.bbc.com/future/article/20230512-what-will-replace-the-international-space-station#:~:text=One%20way%20or%20another%2C%20the,setting%20boots%20on%20the%20Moon.
7. https://www.skyatnightmagazine.com/space-missions/international-space-station-facts-history/
8. https://www.carnegietechnologies.com/news-updates/the-brick-moon/
9. https://www.nasa.gov/apollo-soyuz/overview
10. https://www.nasa.gov/missions/shuttle/f_skylab1.html
11. https://www.nasa.gov/feature/50-years-ago-launch-of-salyut-the-world-s-first-space-station
12. https://www.nasa.gov/apollo-soyuz/overview
13. https://www.wired.com/2012/03/skylab-salyut-space-laboratory-1972/
14. https://www.autoevolution.com/news/space-station-freedom-america-s-idea-for-the-world-s-best-space-station-pre-iss-200284.html
15. https://www.esa.int/Science_Exploration/Human_and_Robotic_Exploration/International_Space_Station/International_Space_Station_legal_framework#:~:text=The%20International%20Space%20Station%20Intergovernmental,in%20the%20Space%20Station%20project.
16. https://www.issnationallab.org/about/iss-timeline/
17. https://www.nasa.gov/feature/visitors-to-the-station-by-country/
18. https://connectivity.esa.int/european-data-relay-satellite-system-edrs-overview
19. https://www.cnet.com/science/space/nasa-considers-spacex-as-emergency-return-option-for-stranded-iss-crew/
20. https://www.nasa.gov/astronauts/biographies/g-reid-wiseman/biography
21. https://www.nasa.gov/astronauts/biographies/sunita-l-williams/biography
22. https://www.nasa.gov/content/zena-cardman-nasa-astronaut
23. https://www.nasa.gov/astronauts/biographies/andrew-r-morgan/biography
24. http://www.collectspace.com/ubb/Forum31/HTML/000501.html
25. https://www.nytimes.com/2022/10/05/science/spacex-launch-russia-crew5.html
26. https://en.armradio.am/2021/02/01/harutyun-kiviryan-selected-by-russia-as-cosmonaut-candidate/
27. https://www.esa.int/Science_Exploration/Human_and_Robotic_Exploration/Astronauts/Marco_Alain_Sieber
28. https://www.esa.int/Science_Exploration/Human_and_Robotic_Exploration/Astronauts/Rosemary_Coogan

29. https://www.sydney.edu.au/news-opinion/news/2022/07/05/g-day-space--australia-is--go--for-launch.html
30. https://www.abc.net.au/news/2023-03-08/first-woman-to-train-as-astronaut-under-australian-flag/102069080
31. https://www.bloomberg.com/news/articles/2023-07-03/japan-rejuvenates-astronaut-ranks-with-28-year-old-surgeon#xj4y7vzkg
32. https://www.ctvnews.ca/sci-tech/jeremy-hansen-will-be-the-first-canadian-to-encircle-the-moon-1.6339981
33. https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/19/president-biden-announces-his-intent-to-nominate-bill-nelson-for-the-national-aeronautics-and-space-administration/
34. https://www.thenationalnews.com/uae/2022/07/16/who-is-russias-new-space-chief-yury-borisov/
35. https://www.cbc.ca/news/politics/lisa-campbell-canada-space-agency-1.5710881
36. https://www.iafastro.org/biographie/hiroshi-yamakawa.html
37. https://www.esa.int/About_Us/Corporate_news/Josef_Aschbacher_ESA_Director_General
38. https://www.theatlantic.com/science/archive/2021/05/elon-musk-spacex-starship-launch/618781/
39. https://www.boeing.com/company/bios/ted-colbert.page
40. https://www.seattletimes.com/business/boeing-revamps-its-defense-division-and-names-a-new-space-chief/
41. https://www.axiomspace.com/team/michael-suffredini
42. https://www.smithsonianmag.com/air-space-magazine/13_sep2018-michael-lopez-alegria-180969922/
43. https://www.nasa.gov/content/national-space-council-users-advisory-group/membership_roster_r_smith/
44. https://spaceflightnow.com/2023/06/07/vulcan-centaur-frf-coverage/
45. https://www.un.org/sg/en/content/sg/personnel-appointments/2023-06-26/ms-aarti-holla-maini-of-the-united-kingdom%C2%A0-director-of-united-nations-office-for-outer-space-affairs