Ensuring Internet Freedom

Problem Statement

Over the past decade, access to the Internet and social media has helped fuel democratic reforms and pro-freedom movements around the world. Unfortunately, the nature of Internet allows for autocratic and dictatorial regimes, such as Cuba, Taliban-controlled Afghanistan, China, and others, to deny access to its citizenry. It is understandably difficult for the United States to intervene every time a pro-democracy movement protests in a hostile nation. However, at minimum, the USA can and should help ensure access to information for the protestors in Havana, Hong Kong, etc. This can be done through quick and inexpensive means available today, via small launch satellite technology.

This summer tens of thousands of Cubans took to the streets of Cuba to protest numerous issues, including food shortages and inflation, but most courageously, the lack of political freedom. The sound of people chanting "Libertad" could be heard across the island nation.

It is illegal to protest the Cuban regime. One of the tools the Communist leadership uses to put down protests is denying access to information via Internet. This is particularly effective because the protestors are then left unaware of the strong support coming from the USA, around the world, and even certain parts of their own country without the flow of information coming from social media and other communication tools. This makes activists feel isolated, wondering if they have support or are being effective; hinders protestors' efforts to organize and share information; and obscures the situation on the ground, delaying reporting on brutal crackdowns until it is too late or hiding atrocities from the public eye.

Similarly, quick satellite access can also be used to address environmental and animal welfare concerns. Rapid response satellite deployment can gather evidence relating to environmental crimes and animal poaching that would be absent by the time slower means could arrive.

Until recently, the concept of rapid deployment of anything to space was pure science fiction. Rocket missions took months or years to plan. Every launch was conducted as a one off, with calculations and safety checks replanned and redone from scratch.

However, that has begun to change in recent years. New launches are taking more into account from prior successes and failures. Space Safari has boasted a record 21-day contract to launch. There are more efforts looking into "rapid" and "responsive" launch capabilities, though few approaching Space Safari's level, let alone CubeCab's capabilities.

Meanwhile, events on the ground often do not conveniently wait months or years for space capability to adjust. When people need access to space resources, they need them right away. Someone navigating using GPS needs to know where they are now, not where they were last week. Those who use satellite Internet as a survival lifeline would be dead if their calls for help were not heard for several months. Anyone committing environmental crimes, if it took years for satellite evidence of their wrongdoing to become available, might be long since gone by then.

Industry Response

CubeCab is developing a rapid-response launch capability. Their Cab-3A is an air launched, all solid fuel rocket. "Air launch" can be read "air to space missile": the Cab-3A rocket is attached to a F-104 flown by civilian operators, which takes the rocket far off over the ocean, dropping it at high altitude and speed, so that first ignition is both far from populated areas (for safety) and easily reconfigured for different missions (for instance, to launch to a different orbit, point in a different direction before ignition). Commercial solid fuel rockets have approximately a zero-failure rate since 2000 and are easier to handle than liquid fuel rockets.

However, the real key is the small payload: each Cab-3A only launches a single 3U CubeSat, up to 5 kilograms, for only $250,000. Most rocket operators see no point in providing an entire rocket to launch something that small, and charge millions of dollars per launch regardless of how much payload is aboard. They assume, incorrectly, that all small satellites can wait indefinitely for a shared ride to orbit and split the cost. Thus, they collectively leave hundreds of CubeSats lying around waiting for launch. This provides enough of a market for CubeCab to potentially conduct hundreds of launches per year, and thus manufacture a corresponding number of rockets per year.

At this scale, bulk manufacturing is justified. Because the rockets are made in bulk, it is little problem to maintain a few rockets in stock or producing more before the supply runs out. If a few rockets are lying around anyway, then a few rockets are always available to conduct emergency launch (assuming the payload is available, and the paperwork can be dealt with quickly – as it likely will be in a true emergency). CubeCab aims to sustain a next business day launch capability for this contingency.

Alternately, if given a few months' notice, the bulk manufacturing operation can be dialed up. CubeCab's initial capacity is 240 launches per year. Investments are planned to increase that number once CubeCab achieves at least 100 launches in a given year, so that a surge capacity of another 100 can be accommodated before the upgrade is complete.

Communication satellites, especially CubeSat-sized ones, are nearly commodity hardware. Ground terminals are little problem; even the iPhone 13 is planned to have satellite connectivity (for emergencies only at first, but this limitation is a software feature, easily modified should Apple wish to do said update). There are plenty of companies that can perform Internet service provider duties. The only challenge preventing quick deployment of satellite Internet over a given region that suddenly needs it is setting up the launches, which CubeCab solves.

Conclusion

Rapid response satellites are a newly available capability, which can support many policy goals where the swift enabling of Internet access, or the fast provision of overhead observational data, are vital enablers.

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