Launching into the State of the Satellite Industry Marketplace

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Chairman Latta, Ranking Member Matsui and Members of the Subcommittee, thank you for inviting me to testify today on the important topic of the state of the satellite industry marketplace. It is an honor to be here to discuss such a timely and important issue. With recent technological breakthroughs in apace and increasingly innovative and cost-effective satellite solutions entering the market, it is an exciting time for the satellite industry as a whole and, more importantly, for users of satellite technologies across the United States and the globe.

I am testifying on behalf of EchoStar Corporation ("EchoStar") out of Denver, Colorado, and its subsidiaries. Founded in 1980, EchoStar is a premier provider of secure satellite communication technologies and services around the globe, and its primary business units including EchoStar Satellite Services and Germantown, Maryland's Hughes Network Systems L.L.C. ("Hughes"). Hughes is the number one global satellite communications service provider, with millions of terminals shipped to customers in more than 100 countries (approximately 50% of the worldwide market share). Hughes' JUPITER System is widely deployed around the world and powers broadband services from leading providers on over 40 satellites, including airborne/maritime/land mobility solutions.

EchoStar remains founder-led by Coloradan Charlie Ergen, along with its sister company, DISH Network L.L.C. ("DISH"), and the companies together employ approximately 17,000 people throughout the United States. DISH's primary business units include its longstanding Direct Broadcast Satellite ("DBS") satellite pay-TV service (which remains the only pay-TV company to launch local broadcast channels in all 210 of the U.S. media markets) and its online streaming television service, Sling TV. Having spent nearly $30 billion on acquiring spectrum, DISH is currently bring innovation and disruption to the wireless industry through its exciting

greenfield buildout of the world's first cloud-native, Open Radio Access Network ("Open RAN") 5G wireless broadband network.

I serve as EchoStar's Senior Vice President of Regulatory Affairs and represent EchoStar before the U.S. government on a number of issues including, most notably for this hearing, spectrum licensing and management. I currently serve as Chair of the United Nation's International Telecommunication Union ("ITU") Study Group that is considering the allocation of additional spectrum for Mobile Satellite Services ("MSS") to support the Internet of Things ("IOT") and similar services. I am also the past Chair of the Satellite Industry Association ("SIA") and the United States ITU Association. In my over 25 years in the telecommunications industry, I have had the honor to serve three times at the Federal Communications Commission ("FCC"), including as the Deputy Chief of the Office of Engineering and Technology and the Public Safety and Homeland Security Bureau. I have written extensively on spectrum issues, including the books, *Global Telecommunications Market Access, Spectrum Wars*, and 2022's *Spectrum Wars: The Rise of 5G and Beyond,* which is particularly relevant today as spectrum becomes more and more important to America's competitiveness for satellite and other communications technologies. I am also the executive producer and director of a new, full-length documentary, *When Wire Was King: The Transformation of Telecommunications*, which puts the telecommunications revolution in historical perspective.

I am excited to share my views on the rapidly evolving satellite communications marketplace and what needs to be done to strengthen American leadership in this global industry. This committee led the way towards a more competitive, and thus more innovative, global market through its Open-Market Reorganization for the Betterment of International Telecommunications Act ("ORBIT") Act of 2000. My company is an important part of the

evolution of the satellite communications industry including through Hughes, which was born out of a garage just up the road in Maryland over fifty years ago by a handful of engineers from Comsat, the former U.S. monopoly satellite provider. Fast forward to today, with EchoStar recently playing a leading role in the development of the inclusion of satellite standards at the 3rd Generation Partnership Project ("3GPP"). The June 2023 final realization of this longtime goal meant that satellite is now officially part of the global 5G ecosystem. With the new 3GPP standards in place, and the development of new cost-effective and innovative satellite technology on the ground and in the sky, the domestic and international regulatory structures and standards processes governing this industry must continue to evolve.

One area where the U.S. satellite industry excels and is continuing to grow in importance is the provision of broadband satellite services in the United States and abroad. Satellite broadband service is critical if we are to have a cost-effective and timely solution to solving the digital divide. Today EchoStar operates three broadband satellites across the United States. Later this year, we plan a U.S. launch of a U.S.-manufactured next-generation geostationary orbit satellite network (or "GSO"), JUPITER 3. The JUPITER 3 network can provide broadband at speeds up to 100 Megabits per second for download, and 20 Megabits per second for upload to American users. In addition, EchoStar is also distributing the low-latency, high-speed broadband services of OneWeb, a non-geostationary ("NGSO") provider operating in low earth orbit.

Despite this success, there are some hurdles to the satellite industry's provision of satellite broadband. A large hurdle is the uncertain timeframes associated with FCC licensing process. For instance, EchoStar has several license applications for both satellite networks and ground stations pending since 2020. This delay in the application process creates uncertainty for service providers in planning for and, more importantly, offering satellite services to their

consumers. America cannot lead if applications pile up at the FCC. If this continues, China will likely be able to get ahead of the United States in the satellite marketplace. We hope that the FCC's recent hiring of more personnel and the creation of the Space Bureau will enable the FCC to move more quickly to address pending and future license applications. However, with the importance of space to the U.S. economy and national security, we ask Congress to ensure that adequate FCC funding be made available to ensure that the resources required to address the increase in satellite licensing activity are made available. We also support the use of guidelines for processing times that the FCC would have to abide by, understanding that at times waivers would have to be given to address complex issues such as the potential for harmful interference between operators. In these cases, efficiency in processing must give way to the need to ensure interference-free communications services to users.

Similarly, it is critical that technology neutrality and inclusiveness govern U.S. broadband policies including with regard to grant funding. This is true for the sake of American consumers as well as for American leadership in this global industry. Satellite networks, unlike terrestrial wired and wireless, can offer high-quality, reliable broadband services to users across the entire United States regardless of their remoteness or geographic challenges. Satellites are particularly good at providing cost-effective broadband services to consumers where it would be far too expensive or impossible to deploy terrestrial infrastructure. That is why Hughes' broadband business remains focused on underserved communities across the country. For example, today a consumer located in the continental United States or southern Alaska can subscribe to our HughesNet services and receive broadband with download speeds of 25 Megabits per second to the consumer, and upload speeds 3 Megabits from the consumer's device (25/3 Mbps) for as little as $64.99 a month. These speeds will increase once JUPITER 3 is launched later this year. In this

manner we play an important complementary role in the broadband services market, enabling access to high-quality, cost-effective broadband service for millions of Americans who otherwise might have limited or no access at all. The availability of HughesNet and competing satellite broadband services mean that a student in rural Ohio can have access to the same information as a student in urban Cleveland on a real-time basis.

While satellite operators, including EchoStar, are active participants in the FCC's Connect America Fund ("CAF") and the Rural Digital Opportunity Fund ("RDOF"), other broadband funding, such as the Broadband Equity, Access, and Deployment Program ("BEAD") program being implemented at the Department of Commerce's National Telecommunication and Information Administration ("NTIA") is essentially closed to satellite operators, despite this Committee's directive in the Infrastructure Investment and Jobs Act that BEAD be technology neutral. This means that states and localities will have to consider much more costly solutions to close the digital gap in their communities which may result in an inability to support the provision of broadband service to areas that need it most because of cost or geographic challenges. Accordingly, we urge this Subcommittee in your oversight of BEAD and related or future programs to ensure that they enable the use of satellite broadband technology. It makes no sense that some government programs, such as CAF and RDOF, include satellite, while others, such as BEAD exclude it. Without the inclusion of satellite broadband services in broadband funding programs, such as BEAD, it is unclear how we will be successfully able to close the digital gap that exists in the United States. And denying satellite operators access to these taxpayer funds certainly does not strengthen American leadership in next-generation satellite technology.

Another area that needs to be addressed is how best to balance the increased need for spectrum across the entire communications sector. With growing demand for satellite services,

just as we are seeing for terrestrial services, there is an increased demand for access to spectrum by satellite operators. Building, launching and operating satellites requires substantial CAPEX and OPEX, and thus requires regulatory certainty, including for spectrum access. To address increased satellite demand, first and foremost, spectrum must be used as efficiently as possible. But this efficiency alone is not sufficient; any solution to meet increased demand for satellite services, while out-innovating our international rivals, must also be accompanied by increased access to spectrum.

With regard to spectrum sharing, for satellite networks operating in the Fixed Satellite Service ("FSS"), where satellites are planned to communicate with fixed devices, sharing of spectrum between operators and terrestrial fixed wireless uses has been a tremendous success. Today, FSS operators share spectrum with one another, whether operating in low, medium, or geostationary orbit networks and with terrestrial fixed services. For example, EchoStar has successfully coordinated its satellite networks with other GSO and NGSO network operators, as well as fixed terrestrial wireless operators. However, there have been and will continue to be challenges as we enable more sharing in the FSS bands unless certain principles are adhered to. First, there must be "good faith" domestic coordination among systems. This means that operators must be incented to find ways to resolve domestic coordination issues as opposed to refusing to agree on approaches to further anti-competitive goals, and the FCC must be willing to oversee this process if problems ensure. Second, there must be long-term certainty for operators for on access to spectrum. Satellite systems are expensive, ranging in cost from hundreds of millions to tens of billions of dollars per system. If satellite systems do not have certainty on long-term spectrum access, such as with current licenses of 15 years and the right of renewal, it will be difficult if not impossible for these operators to obtain the funding required to support these complex and costly

networks. Further, any sharing solution must consider the full operating parameters of these systems, including, for example, the aggregate interference environment. This is extremely important as the deployment of mega-constellations continues. To this end, the FCC must look at aggregate interference with other satellite systems, both GSO and NGSO, as a critical factor that must be addressed in licensing satellite systems and awarding spectrum. If such interference issues are not addressed at the time of licensing, multiple systems could face unacceptable interference, significantly degrading the service provider to users. Before allowing the use of terrestrial spectrum by satellite systems, it is important that there is proof that in-band and adjacent services will not suffer harmful interference. This should be proven through appropriate studies and testing prior to FCC licensing. Failure to do so could result in a repeat of what we saw years ago with garage door openers interfering into military communications.

While the FSS bands have and can be successfully shared, the same is not true for bands allocated to the MSS – designed for terminals that move, such as IOT devices. Today exciting uses of the MSS bands are being made because of advances in technologies and the development of standards in 3GPP and other standards bodies. 3GPP is the industry forum for developing technical specifications for 5G services, including through satellite. A number of MSS operators have announced plans for direct-to-device and other innovative services. EchoStar itself, as a mobile satellite operator supporting LoRa® IOT, in the very near future will deliver 3GPP services.

Unlike FSS services, MSS operators, like cell phone companies that operate in exclusive spectrum, are widely deployed and utilize omni-directional antennas. Today, as is the case with cell phone companies, it is not possible for MSS operators to share spectrum with one another without suffering harmful interference. Therefore, the FCC should not adopt untested and unproven sharing requirements for these bands.

I want to emphasize satellite's need for access to more spectrum and the role of satellite in standards development. Regarding access to additional spectrum, it is critical that if the U.S. prioritizes leadership in the commercial space sector, it must prioritize access to spectrum for this use. This, unfortunately, has not always been the case in recent years and there are certain examples where the FCC limited the satellite industry's use of spectrum in a way that negatively impacted the provision of satellite to users across the United States. To ensure continued American leadership in space innovation, as well as achieve our connectivity goals, as policy makers work through allocation decisions, there needs to be an appropriate balance between terrestrial and satellite interests.

To achieve this goal, the U.S. government needs to take a more proactive role in supporting spectrum use domestically for satellite. Today, the focus on new bands being made available by the U.S. government for commercial use has been limited to transitioning the use to terrestrial wireless. To the extent possible, transitioning government spectrum to the satellite industry for use must also be considered, particularly since the U.S. government is a large customer of satellite. Repurposing of government spectrum for commercial satellite use might better meet the government's need to rebalance their budget while still meeting their mission critical satellite needs.

Another area that calls for attention is the inclusion of satellite technologies in standards development. Legislation out of this Committee directed the Administration to provide greater support to industry in international standards-setting to ensure American leadership in next-generation communications, and satellite is an area ripe for increased attention. It has taken over a decade for satellite to be included in the 3GPP wireless broadband standards which just happened in June 2022. This delay in standard developments occurred in large part because of the terrestrial

operators. We are at another important juncture as we continue to advance the inclusion of satellite in the 5G standards and soon 6G standards at 3GPP and work to advance satellite in the standards for 5G and 6G being developed at the United Nations International Telecommunications Union ("ITU"). These standards are critical to the development of new satellite services such as the cutting edge direct-to-device and IoT markets where EchoStar is a leader. Accordingly, where the U.S. government is a participant in these processes, such as at the ITU, it is critical that the government support the efforts of our satellite industry to advance inclusion in 5G and 6G and beyond standards.

Finally, I would like to call attention to the upcoming 2023 World Radiocommunication Conference (WRC) and other work at the ITU. Over the years, we have seen the U.S. government support time and time again terrestrial industry positions that benefit vendors headquartered overseas, often at the expense of the American satellite industry-- especially regarding access to spectrum. If the United States is going to prioritize domestically American satellite leadership, it must provide the satellite industry with required support at the ITU. Satellite communication, unlike terrestrial wireless communication, is inherently global. Accordingly, the outcomes of WRCs and other actions at the ITU, are particularly important to the U.S. satellite industry. We look forward to working with the FCC's planned Office of International Affairs and the other key government agencies to prepare for this year's WRC on issues critical to the satellite industry.

We are at the most exciting point in the satellite industry in our lifetimes. Satellite communications is poised to become a daily presence in our lives much like the cellphone has. Your Committee led the charge on making the international satellite market more competitive with the ORBIT Act of 2000, thereby opening the door to American innovation. It is critical for the Subcommittee to take a leadership role in this area and fosters an environment that enables the

U.S. to continue to revolutionize this very important sector. Congress, the Administration and the FCC must ensure that the U.S. satellite industry has access to the necessary resources it needs, regulatory certainty and domestic and international support to enable its continued and growing leadership globally.

EchoStar is committed to working with Congress, the FCC, and the Administration to advance policies that facilitate U.S. leadership in the satellite marketplace. The industry would benefit from your oversight. By taking the lead now, as satellite is being included in the 5G eco-system, the U.S. can be sure of continued leadership in the 6G Internet of the Senses, where satellite networks will become even more critical. Thank you for the opportunity to share my thoughts at this important hearing. I welcome any questions.

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