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Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street S.W., TW-A325
Washington, DC 20554

Re: SkyTower Inc.'s Comments for Spectrum Policy Task Force
ET Docket No. 02-135

SkyTower, Inc. ("SkyTower") submits the following comments in response to the questions raised in the Commission's Public Notice, DA 02-1311 (Released June 6, 2002). SkyTower applauds the Commission's appointment of this Spectrum Policy Task Force ("Task Force").

SkyTower looks forward to assisting the Task Force in any way it can.

Respectfully,

/s/
Stuart Hindle
Vice President of Strategy & Business Development
SkyTower, Inc.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

SPECTRUM POLICY TASK FORCE	)	ET Docket No. 02-135

COMMENTS OF SKYTOWER, INC.

SkyTower, Inc. ("SkyTower") submits the following comments in response to the questions raised in the Commission's Public Notice, DA 02-1311 (Released June 6, 2002).

Summary

As the Commission is well aware, new, more spectrally-efficient technologies using digital transmission methods have the potential to significantly alter the telecommunications landscape. These technological changes will make the regulatory distinctions between types of services and types of delivery platforms less relevant - and these regulations should not be a barrier to development. In today's environment, new technologies should also increase the reliability of the critical telecommunications infrastructure.

SkyTower urges the Task Force to outline a vision of the future telecommunications infrastructure. Then, using this vision, develop short and long term milestones to reach its objectives. SkyTower strongly believes that High Altitude Platform Stations (HAPS), will play a significant role in the future telecommunications infrastructure. For example, SkyTower's unmanned solar powered aircraft is a cost-effective, spectrally-efficient delivery platform for a range of commercial applications, and has the mobility and flexibility to provide rapid capacity in case of emergencies. (A short description of the SkyTower system is attached hereto).

Given its perspective as a company seeking to overcome barriers to bring its new technology to the telecommunications industry, SkyTower finds this Commission Task Force to be very timely and it greatly welcomes the opportunity to express its views. SkyTower has focused its comments and recommendations to address processes that can be improved rather than to propose regulatory changes. Although its comments follow the order of the questions posed by the FCC, SkyTower considers the U.S. preparatory process on international spectrum (discussed *infra* Section IV), as an area where significant improvements can be made without the need for regulatory changes.

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I. MARKET ALLOCATION: FLEXIBILITY IN DEPLOYMENT OF DELIVERY PLATFORMS (QUESTIONS 6)

A. Issue Statement. *Licensees can maximize spectral-efficiency by using the most efficient delivery platform, which can include a "cooperative" approach. Regulations and policies should encourage this approach.*

B. Analysis. One path to spectrum for new technologies and/or for combinations of technologies is to allow existing licensees to share, sublicense or sell their under-utilized spectrum capacity to alternative delivery platforms.

1. *Background.* The Commission's policies should reflect the fading distinction between various services and means of delivery. Digitization, new wireless technologies, and new processing techniques are already blurring the distinction between services that provide wireless voice telephony, data, and even broadcast services. For example, PCS and other wireless telephone providers are offering Internet and e-mail services, and Direct Broadcast Satellite providers are beginning to offer internet, e-mail, and interactive services. With sophisticated networks, operators are using a variety of means for delivery and backhaul of information. These cooperative multi-platform approaches could take the form of:

- Augmentation schemes where a licensee augments its existing network with other types of delivery platforms. (For example augmenting a satellite service with HAPS/terrestrial platforms).
- Cooperative sharing, leasing, franchising, or joint operating agreements supported by the Commission's policies on promoting efficient spectrum use.[1]

[1] *See Principles for Promoting the Efficient Use of Spectrum by Encouraging Development of Secondary Markets,* Policy Statement, FCC-00-401, 22 C.R. 791 (Adopted Nov. 9, 2000) (hereinafter "*2000 Policy Statement*").

- Transfers of licenses where a particular platform/technology is unable to fully utilize the spectrum, allowing it to sell part of its rights in the spectrum to another entity that may use another type of platform.

In the last two years, a number of companies have proposed, and in some cases have been authorized, to use these methods. For example, the Commission granted initial approval for Sirius Satellite Radio and XM Radio to augment their satellite signals with terrestrial transmitters.[2] The Commission waived certain technical requirements to allow Space Data Corporation to operate an expendable balloon-based HAPS system in the narrowband PCS service using PCS licenses that it intended to acquire from an existing licensee.[3] Pending before the Commission is ICO's proposal to augment its satellite system with a HAPS/terrestrial component.[4]

In developing a process to allow flexible use of delivery platforms, the Task Force faces certain obstacles. The primary obstacle is the disparity in how entities

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[2] *See Sirius Satellite Radio, Inc., Application for Special Temporary Authority to Operate Satellite Digital Audio Radio Service Complementary Terrestrial Repeaters*, Order and Authorization, DA 01-2171 (Adopted Sept. 17, 2001); *XM Radio, Application for Special Temporary Authority to Operate Satellite Digital Audio Radio Service Complementary Terrestrial Repeaters*, Order and Authorization, DA 01-2172 (Adopted Sept. 17, 2001).

[3] *See Petition for Declaratory Ruling, a Clarification or, in the Alternative, a Waiver of Certain Narrowband Personal Communications Services (PCS) Rules as they Apply to a High-Altitude Balloon-Based Communications System*, Memorandum Opinion and Order, DA 01-2132, (Adopted Sept. 11, 2001).

[4] *In the Matter of Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band and the 1.6/2.4 GHz band; Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile Satellite Service*, IB Docket No. 01-185, ET Docket 95-18.

originally acquired spectrum. The ongoing MSS flexible delivery rulemaking must address this directly and hopefully will present a good model for the future.

2. *Benefits of allowing flexible delivery platforms.* Allowing cooperative sharing has a number of benefits. This will:

- Encourage existing licensees to invest in new technologies that can enhance the efficiency of their systems.
- Benefit the public in that augmented technology (such as HAPS) may be able to extend services to rural and underserved areas.
- Offer lessened interference concerns in some cases. (For example, because of HAPS geometry and flexible deployment, HAPS studies have shown that HAPS systems can share spectrum with satellite based services on certain frequencies.)
- Reduce disputes over interference because the licensee can design a system that reduces co-channel interference and integrate new platforms.
- Allow licensees to divest or lease spectrum assets that they may be unable to fully utilize with their existing technology.
- Increase the value of spectrum because it can be used for multiple purposes and thereby reduce the need for companies to hold onto underutilized spectrum.
- In the case of HAPS, provide a rapid way to augment telecommunications networks degraded by a disaster.

Perhaps the most important benefit to this approach is that it allows new technologies a clearer path to spectrum, without the long and expensive process of creating a new "service."

C. Promoting Flexible Delivery. Since use of flexible delivery platforms will help to enhance spectrum efficiency, promote development of new technologies, and break down some of the regulatory walls between "services", the Task Force should address this issue, and seek to formulate an action plan. Such a plan would

need to move beyond the 2000 Policy Statement[5] to concrete steps. Such actions could include:

- Auction incentives for licensees willing to commit to sharing strategies using new technology platforms that the Commission seeks to promote.
- Creating an expedited process/rules for seeking waivers or other authorization to use an alternative delivery platform not-conforming to the service rules.
- Allowing satellite network operators to augment their operations provided the operator will use and promote new technologies in delivery platforms, such as HAPS, that the Commission wishes to promote.

II. SPECTRAL EFFICIENCY: PROMOTING NEW TECHNOLOGIES, SUCH AS HIGH ALTITUDE PLATFORM SYSTEMS (QUESTIONS 19/6)

A. Issue Statement. *Current processes present enormous obstacles to companies with new technologies that seek to reuse spectrum.*

B. Analysis. The Task Force should seek to identify ways to remove barriers that stifle the development of new technologies such as HAPS.

1. *Background.* The current regulatory system imposes significant obstacles for new technologies to move from prototype to reality. While one path to spectrum was discussed in Section I, the more difficult path, with potentially greater benefit, is for a new technology to be licensed to operate in a specified band (either as a primary or secondary service). For example, a HAPS operator that could offer a turn-key solution providing wholesale high-speed telecommunication

[5] *Supra* note 1.

links over the last mile to existing telecommunications providers presents an attractive economic solution in urban as well as less developed surrounding areas.

Even if a HAPS provider could demonstrate that its technology can share with another service on a secondary basis without causing harmful interference, the HAPS provider is likely to face stiff opposition from the incumbent licensees. Presently, a multi-year rulemaking usually takes place before a potential new entry even finds out if the service will be allowed. In today's capital markets, this process can become a "Catch-22" with funding dependant on spectrum/authorization, and such approval being unobtainable without the financial resources to invest in prolonged regulatory battle to obtain such authorizations.

2. *Benefits from HAPS.* As an example of the benefits of new technology, SkyTower's HAPS based platform has a number of unique features, including:

- Rapidly deployable system that can provide a relatively large regional footprint for both commercial and emergency communications services.
- The ability to share frequencies with systems using other types of platforms (because of its geometry and tight station keeping).
- High frequency reuse (over 1000-times that of satellite due to the relatively low altitude of the HAPS platform).
- The ability to provide a last-mile link at a fraction of the cost per subscriber of running cable/DSL, particularly in less developed areas.
- Flexible platform for providing fixed and mobile communications, including broadband, voice/narrowband, and broadcast video/audio.

- Relatively low initial deployment cost.

C. Improving Success Rates for HAPS and other New Technologies Process.

The Task Force should consider specific steps that could ease the path to spectrum for new technologies. Some suggestions for possible consideration are:

- *Public/Private Partnerships*. Chairman Powell recently addressed the need to establish a partnership with the Defense Advanced Research Projects Agency (DARPA) to facilitate transfer of defense-developed technology to the private sector.[6] SkyTower's solar-powered, unmanned aerial vehicle evolved largely out of NASA funded research. A number of government agencies are either involved in, or interested in, HAPS technology for surveillance, disaster relief, battlefield communications, and other governmental purposes, and NASA sees the commercial development of SkyTower's vehicle as driving down the unit costs for government. Hence, SkyTower could provide a useful model for public/private partnerships.
- *New Technologies "Incubator"*. The Task Force should consider establishing an inter-bureau staff working group, whose mandate is to identify and assist promising new technologies. Among other things, this would create FCC experts in these new technologies and counter the

[6] Remarks of FCC Chairman Michael K. Power, "Digital Broadband Migration" Part II. (Oct. 23, 2001).

problems experienced by new technologies that do not fit clearly into the jurisdiction of any particular Bureau.

- *Auction Credits.* One clear incentive that telecommunications companies are likely to seize on is auction credit. This presents an opportunity for the FCC to create incentives for bidders to use new technologies. For example, the Task Force could consider a number of ways to apply a new technology credit; sudas: (i) providing a credit to bidders who intend to deploy systems using "new" technology with demonstrable benefits over other technologies; or (ii) providing a credit to a bidder who is willing to allow a secondary use of the frequency by a new technology (subject to appropriate interference criteria to protect the bidder). This second method would potentially allow the further auction of the secondary usage.

III. INTERFERENCE PROTECTION (QUESTIONS 7-15)

A. Issue Statement. *The current lack of a straight-forward process for resolving interference issues, both domestically and internationally, often results in interest based, (rather than purely engineering based) outcomes, which favor incumbent systems over new technologies seeking to reuse spectrum.*

B. Analysis. The Task Force should seek to identify clear processes that will be based on sound engineering principles, with accessible dispute resolution procedures, so that interference protection issues do no unduly hinder development of new technologies.

1. *Background.* Currently, the process of deciding interference protection levels creates uncertainty and delay for new technologies seeking to share spectrum. One area where this is particularly problematic relates to the sharing of spectrum between different services and different types of platforms.

For example the lack of a definition for an acceptable level of interference internationally has been a perennial source of concern. The ITU has for years attempted to define "harmful interference" and other interference terms more specifically than the current definitions. Generally, new services seeking access to spectrum should be provided target values of interference that are not to be exceeded. Absent such target values, the extant services feel no obligation to cooperate in the introduction of new services, even if it is obvious that the actual interference would not present a real concern. At the same time, from the perspective of existing services, the new services appear to be entitled to cause very high levels of interference because “harmful interference” is defined to occur only if interference endangers the functioning of a radionavigation or safety of life service or serious degrades other radiocommunication services. *See* ITU Radio Regulations RR-1.169. This sets up conflicting perceptions that are not helpful to either service.

In addition, there is no review process to upgrade interference standards as technology advances. Without such updating, the introduction of new technology could be inhibited by overly protective interference criteria based on out-dated technology. As more robust modulation techniques find increased application (such as CDMA and digital techniques), as equipment parameters (such as antenna efficiency and sidelobe patterns) improve and as radio platforms and delivery systems progress, the ability to accommodate new and innovative applications should increase.

In addition, the dispute resolution process both domestically and internationally could be improved. For example, internationally there is no flexibility to reach negotiated agreements outside of the standards for interference and protection. To complement the technical rules established in the above context, the Commission should allow private parties to resolve interference issues through negotiated agreements. Nevertheless, such agreements should not be prejudicial to the entry of third party systems, whose entry criteria should be based on the objective criteria.

C. Improving the Process.

Improving both the international and domestic processes for resolving interference issues is critical to allow for spectrum sharing and the introduction of new technologies. SkyTower's suggests the following for the Task Force's consideration:

- Work to develop international consensus on meaningful technical definition(s) for acceptable interference in sharing scenarios.

- Develop a review process to ensure interference criteria are consistent with and do not penalize new technologies.

- Develop and encourage conflict resolution processes such as negotiation and mediation, and consider whether and how an independent technical arbitration panel could be used.

IV. INTERNATIONAL ISSUES: IMPROVING THE U.S. PREPARATORY PROCESS (QUESTION 25)

A. Issue Statement. *The Current process for developing the U.S. international spectrum policy could be improved to allow the U.S. to further broad U.S. policy goals in the ITU such as spectrum efficiency and promotion of new technologies.*

B. Analysis. The Task Force should attempt to identify ways to improve the current preparatory process within the U.S. on international spectrum issues.

1. Baseline of the preparatory process. Currently, if a U.S. company seeks to have a proposal relating to international spectrum considered by the U.S. government for submission to the ITU, it must submit that proposal through the established informal working groups and/or U.S. ITU-R study group processes. These working groups are chaired by and largely consist of representatives from major telecommunications companies with an interest in a particular area. The groups work by consensus with FCC staff generally serving

only in an advisory capacity. Before the FCC will consider a proposal, the proposal generally must be approved by both the informal working group (IWG) and the WRC Advisory Council.[7] Hence, these working groups function not only in an advisory capacity, but also as intermediate procedural levels, through which a proposal must pass before being considered by the FCC.[8]

This process creates an enormous obstacle for companies seeking to promote new technologies. For example, entities seeking to protect their turf (i.*e.,* spectrum) can effectively block proposals relating to new technology from ever being formally considered by the FCC. Further, because issues overlap various IWGs and ITU-R study groups, a company must dedicate significant resources to attend the numerous meetings both domestically and internationally. In terms of group dynamics, while competitors within a given industry may cooperate in their common interest, an entity promoting new technology will likely have no allies.

This process means that new technologies are often shut-out altogether or compromises are reached causing a proposal for a new technology to be considered on less desirable frequencies, of limited bandwidth, and/or with severe interference criteria that make deployment of the new technology much more difficult.

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[7] For a technical proposal it must be approved by the relevant ITU-R study group.

[8] The Federal Advisory Committee Act states that: "Unless otherwise specifically provided by statute or Presidential directive, advisory committees shall be utilized solely for advisory functions. Determinations of action to be taken and policy to be expressed with respect to matters upon which an advisory committee reports or makes recommendations shall be made solely by the President or an officer of the Federal Government." 5 U.S.C. App. 1(9)(b).

2. D*amage to U.S. Policy*. This system is counterproductive to a number of major U.S. spectrum policy objectives in that it:

- Deters proposals for new technological uses of spectrum from consideration.
- Leads to U.S. positions that may be contrary to one another, or to broader U.S. objectives.
- May lead to proposals that are substantively weak or internally flawed due to comprise language adopted by various industries in the U.S.

C. Improving the Process. SkyTower believes the Task Force should study this issue and develop changes to improve the U.S. preparatory process. The FCC should seek input from industry in this process. Such changes likely require no regulatory action, and hence could be implemented as a near-term improvement. The following are a few changes SkyTower recommends be implemented:

- Improving public availability of IWG and, if feasible, the ITU-R working documents on the FCC website. (This currently varies from group-to-group).
- Altering the role of the working groups from *de-facto* gatekeeper, to a purely advisory capacity.

Respectfully submitted,

/s/
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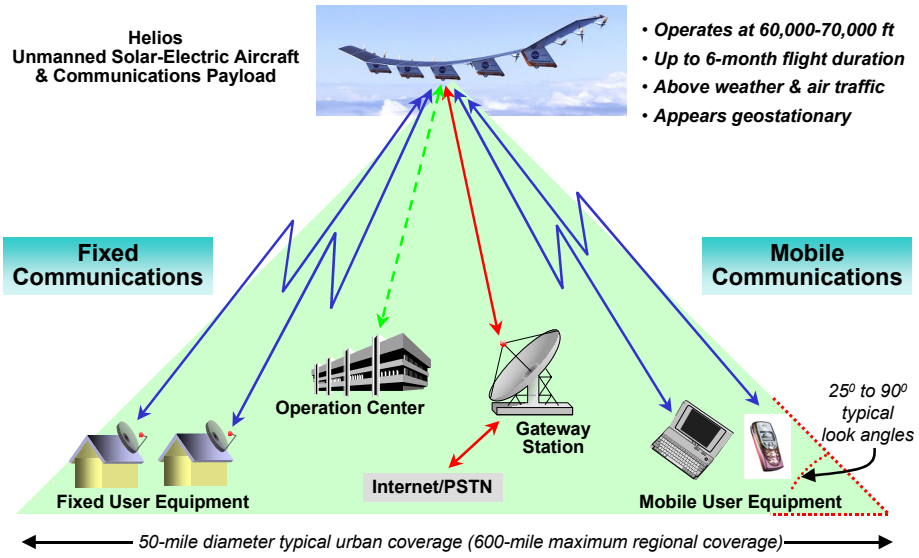
July 8, 2002

Overview of SkyTower System

SkyTower's stratospheric telecommunications platform is a revolutionary technology for bridging the last-mile that has over 1000 times the broadband local access capacity of a satellite, is a fraction of the cost of cable and DSL to deploy, and can be set up in days. It is based on an unmanned solar-electric airplane developed by SkyTower's parent company, AeroVironment, working with NASA, and on communications systems being developed by world-leading vendors.

Telecom System Operation

Between landings, it operates for up to six months continuously at over 60,000 feet in the stratosphere, above the weather and commercial air traffic—the equivalent to a 12-mile tall tower. The platform carries a communications payload that communicates with users on the ground within a 30 to 600 mile footprint, and connects them with a gateway station on the ground tied directly to a fiber optic backbone, or alternatively, a satellite, thus minimizing the need for building out any backhaul infrastructure. Broadband capacity per platform is projected to be 5 Gbps for the first-generation system—multiple platforms can serve the same area, further reusing the same frequency spectrum.



Competitive Advantages/Market Applications

Advantages of this breakthrough platform technology include:

✓ Low cost, scalable ✓ High capacity ✓ Rapidly Deployable ✓ Excellent line-of-sight

✓ Easily maintainable ✓ Upgradable ✓ Relocatable ✓ Capable of sharing spectrum

These advantages open the door to multiple fixed and mobile applications, including broadband, narrowband, and direct broadcast video/audio. SkyTower plans to launch the first service, fixed broadband to residential and business users, at the end of 2004.

SkyTower Business Model
The scope of SkyTower's business is to develop and manufacture stratospheric platforms, based on AeroVironment's proprietary solar-electric aircraft and on communications systems developed by SkyTower's partners, and to sell the infrastructure/lease capacity to regional service providers.

Commercial Development
In August of 2001, Helios shattered the world altitude record for non-rocket powered flight by flying to 96,863 feet, well above the 60,000-70,000 feet targeted for telecom services. The world's first commercial telecom applications are being demonstrated from the stratosphere this summer in Hawaii. A High Definition TV (HDTV) broadcast was successfully tested from a SkyTower platform on June 24, and an IMT-2000 (third-generation) mobile transmission, including video telephony using an off-the-shelf NTT DoCoMo handset, was tested on June 28. Fixed broadband communications between the airborne platform and user equipment with a stationary dish antenna will be demonstrated in 2003, as well as the platform's multi-day flight capability which is enabled by a fuel cell based energy system.

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