Joint Engineering Statement in Support of Transfer of Control Application

This joint engineering statement is being submitted to the Federal Communications ("FCC") by EchoStar Communications Corporation ("ECC") and Hughes Electronics Corporation ("Hughes") in support of their Consolidated Application for Authority to Transfer Control of various FCC licenses. This statement will address some of the more significant efficiencies that will be achieved by the proposed merger of ECC and Hughes.

Transition Plans. ECC and Hughes have determined that there will be substantial efficiencies and synergies (including expense savings and revenue enhancements) as a result of the merger of their two businesses. Many of these benefits will occur almost immediately, while others will take some period of time to be fully achieved. ECC and Hughes have developed a process for determining how best to transition their respective businesses upon completion of the merger. The parties anticipate that many of these transition decisions will have been made by the time the merger closes within the constraints of applicable law, while many other decisions will be made upon consummation of the merger.

Explanation of Transition Process. A joint ECC/Hughes team of key executives and employees has been formed to address the most important transition issues associated with the merger of the businesses of both companies. This team will be led by Charles W. Ergen, the Chairman and Chief Executive Officer of ECC and the person designated to become the Chairman and CEO of the combined company ("New EchoStar"). Other members of this transition team include Michael T. Dugan, President and Chief Operating Officer of ECC, Eddy Hartenstein, Chairman and CEO of DIRECTV and Jack A. Shaw, President and CEO of Hughes. All decisions will be made in the best interests of the combined companies and their subscribers. Some of the

more important operational issues that will need to be addressed include: which set top box platform to use, how best to transition customers to a common set top box platform, the repositioning of existing and planned satellite resources that takes the maximum advantage of the spectrum efficiencies gained by the merger, and the types of programming to be added to the current mix of local, national and high definition programming.

Set Top Box Transition. One of the most important issues that will have to be addressed is which set top box platform to employ on a going forward basis. Each company has chosen different methods for meeting the anticipated needs of its respective customers, including different conditional access systems, transport streams and descrambling structures, which has resulted in the development of set top boxes that are not compatible with one another. ECC has chosen to deploy an MPEG-2, DVB compatible digital architecture that allows for software upgrades via satellite and enhanced addressable security features to minimize signal piracy. ECC's entire family of receivers and most of its outdoor units currently support multiple satellites in multiple orbital locations. While ECC is the principal manufacturer of its set top boxes, JVC and others also produce consumer equipment compatible with ECC's system architecture. ECC's latest models include hard drives that allow for personal video recording (PVR) of up to 35 hours of programming, as well as a High Definition (HDTV) receiver that offers state-of-the-art picture quality.

DIRECTV's digital technology to deliver its programming differs from ECC's in that DIRECTV's receivers use a slightly different error correction method, slightly different compression techniques, and a substantially different conditional access system for protection from signal theft. DIRECTV also employs an MPEG-2 based digital architecture in its set top boxes, but the transport format differs from ECC's, as does its signal encryption scheme. The signal format

and receiver technology used by either company can provide similar, video quality and consumer oriented features. In many receiver models, the primary integrated circuits used are identical. The receiver software provides the unique characteristics associated with either service.

In order to obtain the most significant consumer benefits from the merger, it will be necessary to transition to a common set top box platform. One platform will enable the combined company to achieve substantial manufacturing efficiencies, lowering the overall research and development costs as well as the per unit cost of building receivers for a larger subscriber base. A common set top box platform will also allow each subscriber to receive the maximum amount of programming that a combined fleet of satellites and ground stations can offer. Also, a common set top box will place the combined company on a more level playing field with cable, which has for some time had common technology and shared research and development costs for their set top boxes.

The transition to a common set top box platform will begin almost immediately after the merger. Currently, ECC and DIRECTV together serve approximately 15 million subscribers utilizing separate fleets of DBS satellites located in different orbital positions.[1] The amount of time it will take to complete such a transition is dependent upon the number of set top boxes that may need to be exchanged. Of course, this exchange program would be done as seamlessly as possible at no cost to existing subscribers. During this transition period, satellite signals will be simulcast or simulcrypted, so that subscribers owning either set top box platform can receive their existing programming.

[1] This subscriber number is exclusive of those subscribers who receive DIRECTV programming directly from NRTC and its affiliate entities.

Satellite Fleet Transition. In addition to developing a plan for obtaining a common set top box platform, it will be necessary to develop a complementary plan for transitioning the existing and planned satellite fleets of each company. Today, ECC has six DBS satellites located at four orbital locations. (See Exhibit 1 attached hereto.) From two of these locations (119° W.L. and 110° W.L.) ECC can reach virtually all of the Continental United States (CONUS) as well as Hawaii and portions of Alaska. Due largely to the fact that its first two satellites were assigned to 119° W.L., most of ECC's national programming and approximately 10 percent of its local broadcast programming originate from that location, where it now has two satellites (EchoStar 4 and 6) operating on 21 DBS frequencies.[2] (One of these satellites - EchoStar 4 -- only has limited operational capacity due to a deployment failure and other in-orbit anomalies.) ECC's only other CONUS location is at 110° W.L. where it currently has one satellite (EchoStar 5) providing both national programming and most of its local broadcast programming over 29 DBS frequencies. Two other DBS satellites (EchoStar 1 and 3) provide several types of programming, including HDTV, niche and international programming from the non-CONUS 61.5° W.L. and 148 ° W.L. orbital locations.[3] (EchoStar 2 is in the process of relocating to the 148° W.L. orbital location to augment service at that slot.) In the near future, ECC will launch its first spot-beam satellite (EchoStar 7) to the 119° W.L. orbital slot. Later next year ECC intends to launch its second spot-beam satellite (EchoStar 8) to the 110° W.L. orbital slot.

ECC's satellites operate in a combination of low power and/or high power modes. Generally, the higher the power, the stronger the received signal, the less need for error correction

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[2] Throughout this Engineering Statement, reference will be made to DBS frequencies or DBS transponders. The FCC has allocated 500 MHz of downlink spectrum for DBS service at 12.2 – 12.7 GHz. This spectrum has been further channelized into 32 frequencies/transponders.

[3] The 61.5° W.L. and 148° W.L. orbital locations can reach varying parts of the CONUS with a quality DBS signal.

and/or the more video and audio channels that can be compressed into each DBS transponder. EchoStar 1 and 2 are only capable of operating in a low power mode utilizing up to 16 CONUS transponders. EchoStar 3, 4, 5 and 6 were each designed to operate with up to 32 low power CONUS transponders or up to 16 high power CONUS transponders or a combination of both, while EchoStar 7 and 8 were each designed to operate with 16 high power CONUS transponders and, by operating on five other frequencies re-used 5 times, 25 spot-beam transponders.

While one antenna dish can "see" both the 110° W.L. and 119° W.L. orbital locations, multiple dishes are required to receive programming from the 110°/119° W.L. and either of the 61.5° or 148° W.L. non-CONUS slots. Approximately 80 percent of ECC's subscribers currently have antenna dishes capable of viewing programming from both the 110° and 119° W.L. orbital locations. Approximately five percent of ECC's subscribers have installed multiple antenna dishes for viewing the programming from the non-CONUS orbital locations.

DIRECTV currently has five operational DBS satellites located at three CONUS locations - 101°, 110° and 119° W.L. (See Exhibit 1 attached hereto.) Most of its national and local programming currently originates from the three satellites (DIRECTV 1R, 2 and 3) located at 101° W.L. and operating over its 32 assigned DBS frequencies. Recently, DIRECTV's first spot-beam satellite (DIRECTV 4S) was launched into orbit and soon will be located at 101° W.L. to provide primarily additional local broadcast programming. Additional programming is originated from DIRECTV 6, which is located at 119° W.L. DIRECTV is assigned 11 DBS frequencies at that location. Another satellite (DIRECTV 5) is planned to be launched during the first quarter of 2002 and will be located at 119° W.L. in order to replace DIRECTV 6, which is operating at reduced capacity due to power subsystem issues. DIRECTV also has one satellite (DIRECTV 1) operating on 3 assigned DBS frequencies at 110° W.L. DIRECTV 1 is currently being used for

local broadcast service only. DIRECTV currently has on order another spot-beam satellite that is planned to be in service by the end of the year 2003.

DIRECTV's satellites also have both high power and low power DBS transponders. DIRECTV 1, 2 and 3 can operate with a maximum of 8 high power CONUS transponders or 16 low power CONUS transponders. DIRECTV 1R has 16 high power CONUS frequencies, whereas DIRECTV 5 (not yet launched) and DIRECTV 6 were each designed to operate with a maximum of 16 high power or 32 low power CONUS transponders (although DIRECTV 6 is now limited to 11 low power DBS transponders due to power subsystems issues). DIRECTV's newest spot beam satellite (DIRECTV 4S) is capable of operating on up to 10 high power CONUS transponders as well as 44 spot beam transponders (by re-using 6 frequencies an average of 7.33 times). Most DIRECTV subscribers currently have a single antenna dish that can view only the satellites located at 101° W.L. A small percentage of its subscriber base have antenna dishes that can view programming from DIRECTV's 101° W.L. and 119° W.L. satellites, and an even smaller subscriber base can view programming from the 110° W.L. orbital slot.

There are several possible scenarios for redeploying the combined satellite fleets post merger that would significantly improve the utilization of the DBS spectrum and satellite resources. Under one possible scenario, most national programming could be placed on the 32 DBS frequencies at 110° W.L. with most Western U.S. local and specialty programming moving to 119° W.L. and most Eastern U.S. local and specialty programming moving to 101° W.L. Under another possible scenario, most national programming could be placed on the 32 DBS frequencies at 101° W.L. with corresponding local and specialty programming located on satellites at other CONUS slots. With the existing satellite resources of both companies (assuming spot beam satellites are successfully placed in service), New EchoStar could provide from the three CONUS

locations approximately 540 national standard definition (SDTV) channels (assuming a 10:1 compression ratio – i.e., each DBS transponder compressing 10 SDTV channels) and approximately 940 local broadcast channels which could be used to provide local programming service in up to 100 metropolitan areas throughout the United States, including Alaska and Hawaii.

Such a combined fleet of satellites would also eliminate the obvious inefficiencies associated with splitting up the 32 DBS frequencies at the 110° W.L. and 119° W.L. orbital slots between the two companies. Today, in order for DIRECTV to provide service from its three assigned DBS frequencies at 110° W.L. it must place one of its satellites at that location and equip its subscribers that want to receive its programming with a special three-feed antenna. Even after its spot beam satellite (DIRECTV 4S) becomes operational, DIRECTV will use at least two of its CONUS frequencies at 101° W.L. for the retransmission of local broadcast programming, leaving approximately 240 SDTV video channels available for national programming (again, assuming 10:1 compression ratios). Conversely, ECC is currently limited to providing approximately 210 national SDTV video channels from its 21 assigned DBS frequencies at 119° W.L., assuming no local broadcast channel feeds. Without spot beam satellites, this figure would be reduced on a one-for-one basis as every local station is added, and would be reduced to a maximum of approximately 160 national SDTV video channels when EchoStar 7 becomes operational (*i.e.*, ECC would be able to retransmit up to 250 local SDTV stations using five CONUS frequencies, but in so doing reduce the number of SDTV channels available for national programming by about 50).

Ground Station Transition. Today, ECC operates two ground station complexes, one in Cheyenne, Wyoming and the other in Gilbert, Arizona, primarily to backhaul national and local programming and to uplink that programming to its fleet of satellites. These facilities also provide primary and backup telemetry, tracking and command (TT&C) for its in-orbit satellites.

DIRECTV has similar earth station complexes in Los Angeles, California and Castle Rock, Colorado. Each complex includes numerous earth station antennas and associated electronics and hardware, and must be manned by an extensive staff of skilled technicians, operators, and engineers on a 24x7 basis.

There are several potential scenarios post merger that will result in significant cost savings for the New EchoStar. Clearly, both companies must invest significant recurring dollars to backhaul local stations across the country to each of their uplink facilities, which results in nearly a one hundred percent duplication of equipment and fiber. Much of this duplication could be eliminated post merger. While it is desirable to maintain some site diversity between uplink centers, additional benefits can be obtained by minimizing equipment redundancy between the companies, and by eliminating the need to expand continually the existing facilities to support the growing list of must carry local broadcast channels.

Comparison of Channel Capacities. A combined ECC/DIRECTV will have significantly more DBS channel capacity at its disposal to provide more national and local programming to its subscribers than each company would have absent the merger. ECC and DIRECTV currently are assigned 50 and 46 CONUS transponders, respectively. Assuming a 10:1 compression ratio for SDTV channels and no spot beam satellites (which is the case today), ECC can employ up to 500 SDTV video channels while DIRECTV can employ up to 460 SDTV video channels. Of this amount, however, a substantial number of these channels are currently being utilized by each company for the provision of the same local broadcast channels (4 to 5 channels per metropolitan area) in approximately 35 metropolitan areas. Upon the successful launch and placement in orbit of spot beam satellites, each company should be able to maintain approximately

the same number of metropolitan areas with local broadcast stations while fulfilling its must carry obligations under the Satellite Home Viewer Improvement Act of 1999 ("SHVIA").

Today, each company also offers its subscribers a national programming lineup that is very similar in content, substantially duplicating each other's programming. (See Exhibit 2 attached hereto.) ECC has approximately 235 national programming channels and DIRECTV has approximately 179 national programming channels. Of these, approximately 150 channels are duplicative. DIRECTV also carries about 40-50 pay-per-view (PPV) channels depending on the season, whereas ECC carriers about 39 PPV channels, six of which are simulcast on the satellites located at 61.5° W.L. and 148° W.L. This leaves only enough channel capacity to offer the requisite minimum of educational and public affairs programming and a few HDTV channels, which require significantly more bandwidth than SDTV video channels.

The combined company would be able to eliminate much of the substantial duplication of local broadcast and national programming and thereby increase significantly the amount of national programming choices and local broadcast areas, as well as more HDTV, educational, niche and international programming.

More Local-Into-Local Stations and Metropolitan Areas. Each DBS company typically offers only a few local broadcast stations to a small number of metropolitan areas. Today, ECC offers 4-5 local stations in 36 metropolitan areas, whereas DIRECTV offers approximately the same number of local stations in all but one of these metropolitan areas plus an additional 6 metropolitan areas for a total of 41 metropolitan areas. (See Exhibit 2 attached hereto.) Post merger, the combined company will be able to eliminate much of this local channel duplication and free up additional channels to serve upwards of 100 metropolitan areas with local programming, including at least one metropolitan area in each of the fifty states.

More HDTV Programming. Currently, DIRECTV and ECC only have enough satellite capacity to offer 2-3 full-time HDTV channels to their subscribers. Moreover, in order for any subscriber to obtain this programming he or she must purchase and install a special antenna dish. This is because ECC only offers HDTV programming from its non-CONUS 61.5° W.L. and 148° W.L. locations, while DIRECTV utilizes some of its capacity at 119° W.L. for this programming. Absent the merger, it is unlikely that many more, if any, additional HDTV programming would be carried on either DBS company's channel lineup due to the significant bandwidth requirements for such programming and the competing demands for other programming choices. Post merger, with the spectrum freed up by avoiding the duplication of national and local programming, it is anticipated that New EchoStar will be able to offer at least 12 HDTV channels from one or more of its full CONUS orbital locations.

Better Service to Alaska and Hawaii. It has been a challenge for DBS providers to offer the full range of programming choices to residents in Alaska and Hawaii due to their far western and northern locations in relation to the CONUS orbital slots centered over the United States. Most subscribers in these locations also require larger antenna dishes. Neither company is able to offer any local broadcast channels over their current operational fleet of satellites; however, with the upcoming launches of ECC's spot beam satellites, it will be able to offer such programming.

With the combined satellite and spectrum resources of both DBS companies, New EchoStar will be able to offer more program choices to the residents of Alaska and Hawaii. Not only will they receive the best available programming currently being offered by each DBS provider, but they also will benefit from the increased programming choices available as a result of the spectrum efficiencies outlined above.

More Reliable Service. New EchoStar's increased spectrum efficiency and better utilization of satellite capacity will also enable it to provide more reliable service. This benefit is derived from two primary areas: the increased redundancy associated with more in-orbit satellites in case of unexpected satellite failures; and the ability to utilize the additional capacity where available to increase the amount of error correction applied to the DBS signal.

More Diverse National Programming. As shown in Exhibit 2, there is substantial duplication of the existing national programming currently being offered by ECC and DIRECTV. There is substantially more video programming, music programming, and other programming services available to DBS providers than they currently have the channel capacity to provide to their subscribers. For example, of the approximate 300 national programming channels available today, ECC currently includes about 235 on its programming menu. DIRECTV includes even fewer channels on its programming menu.

Enhanced Near Video-on-Demand Capabilities. Today, due to their spectrum constraints both ECC and DIRECTV have limited capabilities to offer their subscribers video-on-demand services. While both companies now offer set top boxes with personal video recorders (PVR) that allow the viewer to download up to 35 hours of programming on hard drives for later viewing, this convenience is not equivalent to video-on-demand service. Such service requires the storage of an extensive library of movies and other programming by the DBS provider for almost instantaneous retrieval by millions of active subscribers. Through the offering of more pay-per-view channels with staggered viewing times, as well as more extensive use of PVR caching, however, New EchoStar will be better able to approximate video-on-demand services for its subscribers.

Substantial Procurement, Operational and Manufacturing Savings. The combined company, with its larger subscriber base and unified fleet of satellites and ground infrastructure, will be able to achieve substantial cost savings as a result of the merger. ECC's preliminary estimates for these expected cost savings amount to almost $3 billion per year. A significant portion of these savings will be achieved through reductions in subscriber acquisition costs, more efficient distribution of product offerings, reduced production cost, more cost-effective set-top box research and development, and more efficient advertising. New EchoStar should also benefit from substantial savings through reduced programming costs associated with having a larger subscriber base since most DBS distribution arrangements offer additional discounts on a volume basis. In addition, New EchoStar can expect to achieve substantial savings from a reduction in subscriber churn as more services are offered over a unified platform that can better compete with digital cable. Moreover, significant cost savings will be achieved by rationalizing the satellite fleet of both companies, by eliminating future satellite procurements and capital expenditures, by achieving operating efficiencies and by eliminating duplicative overhead expenses. For example, the merged company could serve its national customer base and fully utilize the spectrum resources at the three CONUS DBS locations with fewer satellites at each orbital slot. Indeed, upon the successful launch of EchoStar 7, ECC could utilize fully all 32 DBS transponders at the 119° W.L. orbital location operating just two satellites instead of the four that are slated to operate there.

Technological Developments. The combined resources of the merged companies will also lead to the more rapid and efficient deployment of newer technologies, including possibly the introduction of advanced modulation, coding and compression techniques that would further enhance overall channel carrying capacity. Given the current platforms that each company employs and their existing fleet of satellites, however, neither DBS provider alone can expect to

achieve any significant improvements in channel capacity using the limited spectrum resources available to them. Each company already compresses its digital signals to achieve approximately a 10:1 ratio of SDTV programs per DBS transponder. Four to five years ago, compression ratios of 6-8 were achievable and the future outlook using existing hardware is only expected to achieve ratios of about 12:1 with acceptable service quality.

Moreover, while spot-beam satellites soon will be launched that will enable greater frequency reuse and allow for additional local programming over the same number of DBS transponders, they were designed based upon the current inefficiencies in the fragmented assignment of DBS frequencies. For example, ECC designed both of its spot beam satellites with the understanding that it had access to only 21 DBS transponders at 119° W.L. With this limit in mind, ECC could only devote five of these transponders to spot beams, since it needed the remaining 16 DBS frequencies for national programming. Each of ECC's spot beam satellites was also designed with the understanding that it could be used as a partial backup for the other spot beam satellite in case of a launch or in-orbit failure.

In any event, these future achievements in spectrum efficiencies are being more than offset by the increased demands for satellite bandwidth. As noted above, DBS providers soon will be required by the satellite must carry provisions of SHVIA to retransmit a significantly greater number of local broadcast channels in each metropolitan area that they currently provide local programming. It is estimated that ECC alone will need up to 300 more video channels to maintain all of its local programming areas. Similarly, DIRECTV will require approximately 330 more video channels in its local programming areas to comply with SHVIA. In addition, as viewers begin to watch more HDTV programming, it will become more difficult to satisfy their demand for such programming using existing satellite and spectrum resources. Today, ECC and DIRECTV

need an entire DBS transponder to provide one HDTV channel (as opposed to approximately 10 SDTV channels in each transponder). While there may be some improvements in this compression ratio over time, with the limited spectrum resources of each company it simply will not be possible to satisfy the potential demand for high definition programming.

DBS providers also compete today with digital cable that is offering an ever growing number of national and pay-per-view programming to their subscribers. ECC and DIRECTV are therefore extremely constrained in devoting any more of their national DBS capacity to local programming or other services and expect to continue to compete at a national level. Tradeoffs constantly must be made as to how best to employ their limited spectrum resources.

Broadband Satellite Deployment Efficiencies. ECC's and Hughes' experiences to date with their investments in several broadband technology companies have been mixed. While ECC currently offers a two-way broadband service through its affiliate, Starband, the subscriber take rate for this service has been slow with the prospects unlikely for increasing the number of subscribers significantly in the near future. Starband leases CONUS transponders on Ku-band satellites and offers a two-way broadband service to residential consumers starting at about $70 per month. Hughes' satellite broadband offerings (DirecPC and now DIRECWAY) also have not yet obtained sufficient scale in their residential subscriber base to achieve stand-alone viability. When used for point-to-point services, current Ku-band satellite platforms do not provide sufficient spectral efficiency to achieve the competitive price levels needed for significantly faster subscriber ramp up.

ECC and Hughes also have investments in Ka-band projects – Wildblue and Spaceway, respectively. While these programs both use Ka band satellites, they differ in their technological and commercial approach. Spaceway plans on deploying a number of Ka-band

satellites starting in 2003. Both companies are using spot-beams, although Spaceway will be using a larger number of beams and on-board processing (enabling services using a single hop) and packet replication which will significantly increase the flexibility of the platform. ECC also is building a Ku/Ka-band satellite (EchoStar 9) with limited spot beam capabilities. This satellite could be used to backhaul DBS programming to ECC's uplink facilities and/or to provide limited broadband services.

ECC and Hughes believe that Ku-band two-way broadband satellite services, such as those implemented by Starband and Hughes, will struggle to achieve sufficient economies of scale to effectively compete with terrestrial DSL and cable broadband services. Both companies believe, however, that the new Ka-band satellite platforms offer the opportunity to achieve price points that will allow broadband satellite services to compete with terrestrial broadband alternatives. In order to achieve the necessary economies of scale and scope, one company must have access to a sufficient number of state-of-the-art satellites in relatively close proximity to one another and must have enough spectrum to sustain a critical mass of subscribers. ECC and Hughes estimate that at least 5 million subscribers would be necessary in the next 5 years to recover the significant up front investment and subscriber acquisition costs associated with launching and marketing such two-way broadband satellite service. Since each Ka-band orbital slot can only serve at most 1.5 to 2.0 million subscribers with the use of spot beam satellites, access to a number of orbital locations is necessary to begin to meet even these minimum subscriber objectives.

Broadband satellite systems also require ground stations and access gateways, both primary and redundant, as well as the provision of customer support facilities. Considerable efficiencies will be achieved through the merger of these operational activities and investments leading to reduced costs and lower service prices. In addition, the consumer terminals required for

the provision of satellite broadband services are more expensive than the equivalent terrestrial terminals. Significant reductions in satellite terminal costs can be achieved by manufacturing efficiencies brought about by increased volumes. Increasing the size and rate of development of the Ka-band systems will have a major positive impact on terminal cost, in turn, significantly increasing the competitiveness of these systems.

In summary, New EchoStar, with its combined Ka and Ku-band spectrum and satellite resources, will be able to achieve operating scale and efficiencies that will allow it to provide broadband services that will compete effectively with terrestrial broadband systems. It will have access to a sufficient number of Ka-band orbital slots within an arc of 22 degrees, which will facilitate a one dish solution for consumers and allow for needed redundancy in case of operational problems. It also will be able to achieve scale in manufacturing to significantly reduce subscriber terminal costs, and offer bundled DBS and broadband services that will permit full competition with digital cable by significantly increasing the perceived value of the services. In addition, New EchoStar can offer its broadband services to a much larger DBS subscriber base, which will help alleviate the high subscriber acquisition costs and provide services that will compete effectively with terrestrial broadband systems. Finally, by combining the investments of both companies and standardizing the product, the fixed costs for the system will be reduced by 50%, providing a more competitive and compelling product to the American consumer.

Orbital Slots & Frequencies

Longitude	DTV	ECC	Other / Unassigned
61.5	-	19*	13**
101	32	-	-
110	3	29	-
119	11	21	-
148	-	24	8

* 11 ECC; 8 Dominion (ECC operates 6 of the 8)

** ECC currently operates the 13 unassigned frequencies under STA

Exhibit 1 to Engineering Statement

Orbital Assets -- 12/1/01

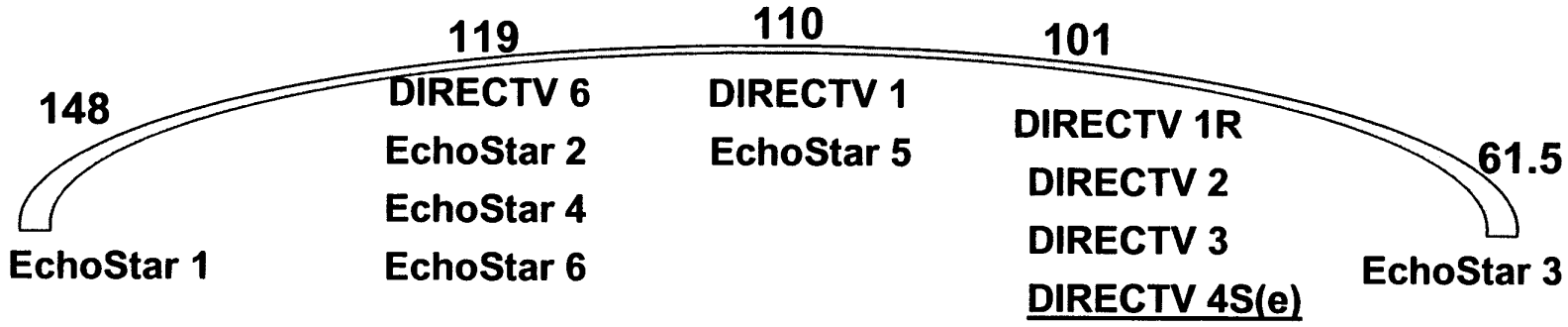


Exhibit 1 to Engineering Statement

Orbital Assets -- 1/1/02

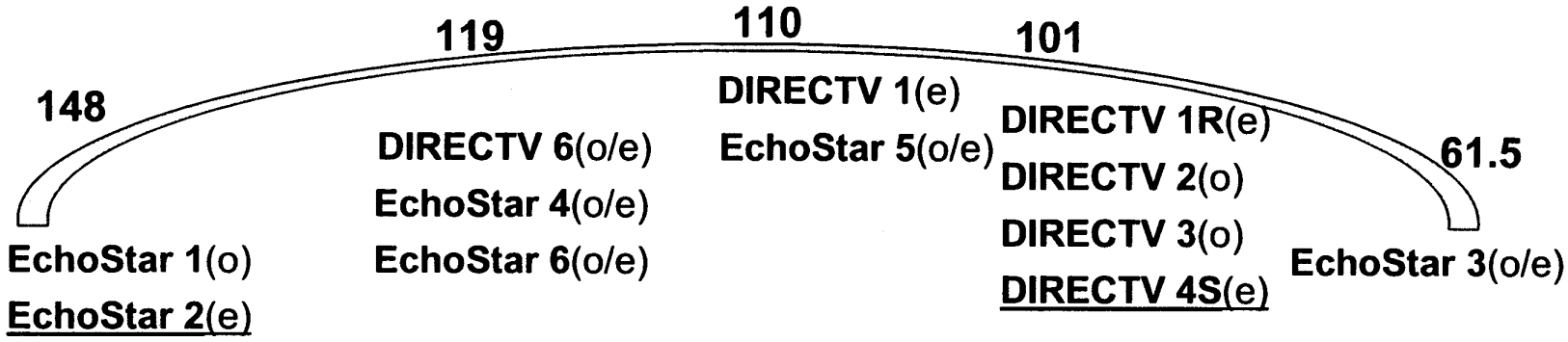
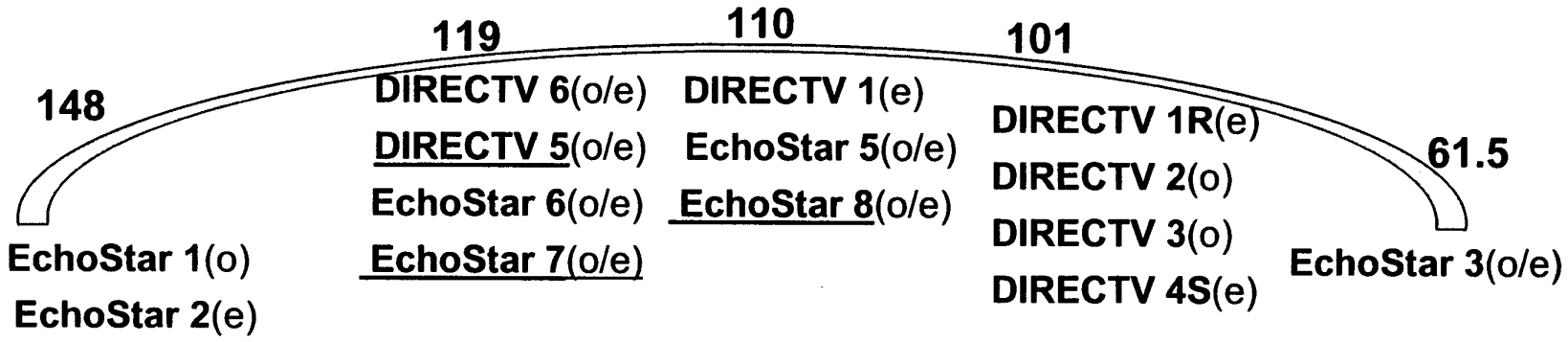


Exhibit 1 to Engineering Statement

Orbital Assets -- 1/1/03

(estimated)



EchoStar 4 - TBD

Exhibit 1 to Engineering Statement

Duplication of Dish Network and DIRECTV Standard Programming

Channel	Dish Network	DIRECTV
A&E Network	✓	✓
All News Network		✓
America's Collectibles	✓	
American Movie Classics (AMC)	✓	✓
Angel One	✓	
Animal Planet	✓	✓
BBC America	✓	✓
Biography Channel, The	✓	✓
Black Entertainment Television (BET)	✓	✓
Bloomberg Television	✓	✓
Boomerang	✓	✓
Bravo	✓	✓
BYU-TV	✓	✓
Cartoon Network	✓	✓
CCCSat	✓	
Claravision		✓
CNBC	✓	✓
CNN	✓	✓
CNN/Sports Illustrated	✓	✓
CNNfn/CNN International	✓	✓
Comedy Central	✓	✓
Country Music Television (CMT)	✓	✓
Court TV	✓	✓
C-SPAN	✓	✓
C-SPAN2	✓	✓
Discovery Channel	✓	✓
Discovery Civilization	✓	✓
Discovery Health Channel	✓	✓
Discovery Home & Leisure	✓	
Discovery Kids	✓	✓
Discovery Science	✓	✓
Discovery Wings	✓	
Disney Channel (East)	✓	✓
Disney Channel (West)	✓	✓
Do It Yourself Network	✓	✓
E! Entertainment Television	✓	✓
Educating Everyone	✓	
Encore ACTION	✓	✓
Encore EAST	✓	✓

Channel	Dish Network	DIRECTV
Encore LOVE STORIES	✓	✓
Encore MYSTERY	✓	✓
Encore TRUE STORIES	✓	✓
Encore WAM!	✓	✓
Encore WEST	✓	✓
Encore WESTERNS	✓	✓
ESPN	✓	✓
ESPN Classic	✓	✓
ESPN2	✓	✓
ESPNEWS	✓	✓
EWTN	✓	✓
Food Network	✓	✓
Fox Family Channel	✓	✓
Fox Movie Channel	✓	✓
Fox News Channel	✓	✓
Fox Sports World	✓	✓
Free Speech TV	✓	
FX	✓	✓
Galavision	✓	✓
Game Show Network	✓	✓
Gems Shopping Network	✓	
Golf Channel, The	✓	✓
Good Samaritan Network	✓	
Great American Country (GAC)	✓	
Hallmark Channel	✓	✓
Headline News	✓	✓
Health Network		✓
History Channel International	✓	
History Channel, The	✓	✓
HITN	✓	
Home & Garden Television (HGTV)	✓	✓
Home Shopping Network	✓	✓
Independent Film Channel (IFC)	✓	✓
Inspirational Life		✓
*i*Shop	✓	
Learning Channel, The (TLC)	✓	✓
LDS Radio Network	✓	
Lifetime	✓	✓
Lifetime Movie Network	✓	✓
Linkmedia	✓	✓
Movie Channel West, The	✓	✓
Movie Channel East, The	✓	✓

Channel	Dish Network	DIRECTV
Movie Channel Xtra East, The	✓	
Movie Channel Xtra West, The	✓	
MSNBC	✓	✓
MTV	✓	✓
MTV2	✓	✓
MuchMusic		✓
NASA	✓	✓
National Geographic Channel		✓
National Network, The		✓
NBA.Com TV		✓
Newsworld International		✓
Nickelodeon Games & Sports	✓	
Nickelodeon/Nick at Nite (East)	✓	✓
Nickelodeon/Nick at Nite (West)	✓	✓
Noggin	✓	✓
Northern Arizona University	✓	
Outdoor Channel	✓	
Outdoor Life Network	✓	✓
Oxygen		✓
PAEC	✓	
PAX	✓	✓
PBS Kids		✓
PBS YOU	✓	✓
QVC	✓	✓
Regional Sports Networks (22 channels)	✓	✓
Research TV	✓	
RFD	✓	
Romance Classics	✓	
SCI FI Channel	✓	✓
Shop at Home	✓	
ShopNBC	✓	✓
SoapNet	✓	
Speedvision	✓	✓
Star Net		✓
Style	✓	
TBS Superstation	✓	✓
Tech TV	✓	✓
TNT	✓	✓
Toon Disney	✓	✓
Travel Channel	✓	✓
Trinity Broadcasting Network (TBN)	✓	✓
TRIO		✓

Channel	Dish Network	DIRECTV
Turner Classic Movies (TCM)	✓	✓
Turner South	✓	✓
TV Games	✓	
TV Land	✓	✓
University of California	✓	
University of Washington	✓	
Univision East	✓	✓
Univision West		✓
USA Network	✓	✓
VH1	✓	✓
VH1 Classic	✓	✓
WE: Women's Entertainment		✓
Weather Channel, The	✓	✓
WGN Superstation	✓	✓
Wisdom Television	✓	
Word Network		✓

Duplication of Dish Network and DIRECTV Premium and Other Programming

Channel	Dish Network	DIRECTV
Black Starz!	✓	✓
CINEMAX East	✓	✓
MoreMAX	✓	✓
CINEMAX West	✓	✓
E-Clips	✓	
Extasy	✓	
FLIX East	✓	✓
HBO East	✓	✓
HBO West	✓	✓
HBO Comedy East	✓	
HBO Family East	✓	✓
HBO Family West		✓
HBO High Definition	✓	✓
HBO Latino East	✓	
HBO Plus East	✓	✓
HBO Plus West	✓	✓
HBO Signature East	✓	✓
Hot Zone	✓	
TeN	✓	
PLAYBOY TV	✓	✓
SHOWTIME East	✓	✓
SHOWTIME Beyond East	✓	
SHOWTIME Extreme East	✓	✓
Showtime High Definition	✓	✓
SHOWTIME Three East	✓	✓
SHOWTIME Too East	✓	✓
SHOWTIME West	✓	✓
STARZ! Cinema East	✓	
STARZ! Cinema West	✓	
STARZ! Family East	✓	
STARZ! Theater East	✓	✓
STARZ! East	✓	✓
STARZ! West	✓	✓
SUNDANCE CHANNEL East	✓	✓

Duplication of Dish Network and DIRECTV Spanish Language Programming

Channel	Dish Network	DIRECTV
TV Azteca	✓	
Cine Latino	✓	✓
CNN En Espanol		✓
Discovery En Espanol	✓	✓
Dish CD Latin – 6 Channels	✓	
EWTN Red Global Catolica		✓
Fox Sports World Espanol	✓	✓
Gems	✓	✓
Gran Canal Latino	✓	
HTV	✓	
MTV-S	✓	✓
Music Choice – 7 Channels		✓
Playboy En Espanol	✓	
Puma-TV		✓
SUR	✓	✓
Telefe Internacional		✓
Telemundo East	✓	✓
Telemundo West		✓
Telemundo Internacional	✓	✓
The Weather Channel Latin		✓
TV Chile	✓	✓
TV Espanola Internacional	✓	✓
Utilisima		✓

Duplication of Dish Network and DIRECTV Local Programming Metropolitan Areas

Channel	Dish Network	DIRECTV
Albuquerque, NM	✓	
Atlanta, GA	✓	✓
Austin, TX	✓	✓
Baltimore, MD		✓
Birmingham, AL	✓	✓
Boston, MA	✓	✓
Charlotte, NC	✓	✓
Chicago, IL	✓	✓
Cincinnati, OH	✓	✓
Cleveland, OH	✓	✓
Columbus, OH		✓
Dallas/Ft. Worth, TX	✓	✓
Denver, CO	✓	✓
Detroit, MI	✓	✓
Greensboro, NC		✓
Greenville, SC	✓	✓
Houston, TX	✓	✓
Indianapolis, IN	✓	✓
Kansas City, MO	✓	✓
Los Angeles, CA	✓	✓
Memphis, TN		✓
Miami/Ft. Lauderdale, FL	✓	✓
Milwaukee, WI		✓
Minneapolis, St. Paul, MN	✓	✓
Nashville, TN	✓	✓
New York, NY	✓	✓
Orlando/Daytona, FL	✓	✓
Philadelphia, PA	✓	✓
Phoenix, AZ	✓	✓
Pittsburgh, PA	✓	✓
Portland, OR	✓	✓
Raleigh/Durham, NC	✓	✓
Sacramento/Stockton, CA	✓	✓
Salt Lake City, UT	✓	✓
San Antonio, TX	✓	✓
San Diego, CA	✓	✓
San Francisco/Oakland/San Jose, CA	✓	✓
Seattle/Tacoma, WA	✓	✓
St. Louis, MO	✓	✓

Channel	Dish Network	DIRECTV
Tampa/St. Petersburg, FL	✓	✓
Washington, DC	✓	✓
West Palm Beach, CA		✓

Total Duplicated Channels (not including must carry)	**300+**	**300+**