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July 27, 1999

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

Magalie Roman Salas  
Secretary  
Federal Communications Commission  
445 12th Street, S.W.  
Washington, D.C. 20554

Re: Ex Parte Notification  
Direct Access to the INTELSAT System  
IB Docket No. 98-192

Dear Ms. Salas:

On July 20, 1999, representatives of COMSAT Corporation ("COMSAT") and the Commission's Office of Plans and Policy ("OPP") participated in a conference call in the above-referenced proceeding. Taking part in the conference call were Howard Polsky, Maury Mechanick, Theodore Boll and Keith Fagan of COMSAT; Dr. Jerry Green of Harvard University; Johannes P. Pfeifenberger of The Brattle Group; Dr. Howard Shelanski, Chief Economist of the FCC; and Marilyn Simon of OPP.

During the conference call, the participants discussed some of the reasons why Level 3 direct access would lead to uneconomic bypass, even with a Signatory surcharge. It was pointed out that:

- Most INTELSAT Signatories are vertically and horizontally integrated national telephone companies that use INTELSAT capacity to meet their internal requirements. Unlike COMSAT, these Signatories principally utilize capacity obtained from INTELSAT (as well as from other suppliers) as inputs in the provisioning of various telecommunications services. Hence, they have no interest in establishing a price structure for INTELSAT capacity that reflects commercial considerations such as investment risk. After all, cost-sharing cooperatives are not created for that purpose.
- COMSAT, however, does have such an interest, because COMSAT is not a consumer of INTELSAT capacity as part of a national telephone business. Rather, COMSAT sells INTELSAT capacity on a stand-alone basis to nonaffiliated companies that in turn provide telephone services to users.

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List A B C D E

- As a cooperative, INTELSAT is designed to make capacity available to the owners of the system. Thus, there is relatively little difference between long-term and short-term utilization charges (IUCs). A fixed surcharge over the IUCs would allow customers who have made no investment in the system to avoid long-term lease commitments and still enjoy the relative pricing advantages afforded to Signatories who have invested in the system. This basic price distortion explains why the proponents of direct access are so eager to obtain it.
- The relative IUCs for different services also do not reflect the market. INTELSAT's "prices" to its owners derive from sharing costs and risks within a closed system. They serve the cooperative's internal purposes and may depart in any number of ways from commercial pricing principles in competitive markets. Some cases in point are discussed in Attachment A hereto.
- COMSAT's price structure, which must face competitive market discipline, seeks to prevent cherrypicking of underpriced services. But if the prices for INTELSAT capacity were based on the IUCs (as would be the case under Level 3 direct access), the Commission would need to adopt not one, but a series of surcharges in order to prevent such cherrypicking. In other words, to avoid distorting the market and forcing COMSAT to subsidize its customers (and even its competitors), the Commission would have to adopt a whole set of surcharges that would simulate the market prices that COMSAT already charges.
- There is no reason for the FCC to attempt to simulate market prices administratively when it has already determined that COMSAT is non-dominant and has no market power. Indeed, the notion that the FCC can set prices better than the marketplace contradicts the most fundamental tenets of its policies as well as the very idea that direct access will produce a competitive market outcome.

The participants in the conference call also discussed the alleged "non-price" benefits of direct access. The following points were mentioned.

- The proponents of direct access claim that INTELSAT is more responsive to customer needs than "third party" Signatories.

While that may be true in some countries, it is demonstrably untrue in the United States.

- Because foreign Signatories treat INTELSAT primarily as a source of supply for their own telecommunications businesses, they have little or no interest in seeing INTELSAT become an innovative service provider in its own right. This situation is especially pronounced in developing countries, where Signatories typically do not face intense competition.
- The situation in the U.S. is completely different, however. As the sole "pure play" investor in INTELSAT, and as the only Signatory whose INTELSAT business is its principal business, COMSAT has a unique interest in seeing INTELSAT become more responsive to user needs.
- Thus, while INTELSAT may be more responsive than many of its Signatories, the claim that it is more responsive than COMSAT is not supported by the facts. COMSAT's record of innovation speaks for itself (see Attachment B). But beyond that, INTELSAT's own rules do not allow it to adapt to consumer demands with the same ease as its competitors. INTELSAT can change or add services only when the Board of Governors meets, i.e., once every three months. Moreover, major service initiatives usually take at least two meetings to get through the Board -- which means a minimum six-month delay.
- In contrast, now that COMSAT has been declared non-dominant, it can modify the vast majority of its service offerings on one day's notice. Moreover, INTELSAT provides service only through tariffs of general applicability, but COMSAT can enter into individual agreements with U.S. carriers to meet their particular needs, and now offers custom tariffs for many services as well.
- Complaints that "INTELSAT offers services that COMSAT does not" are completely unjustified. As Attachment B shows, it is far more often the case that COMSAT offers services that INTELSAT does not -- or that INTELSAT offers services only after being urged to do so by COMSAT. COMSAT has no reason to withhold an INTELSAT service from the U.S. market if there is real demand for it.
- However, COMSAT does have an interest in seeing to it that INTELSAT services are offered pursuant to rational commercial rates, terms and conditions. Thus, what direct access

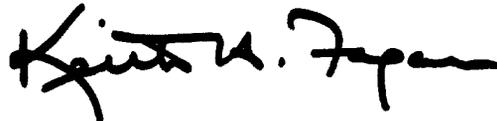
proponents refer to as COMSAT's "inflexibility" is really its unwillingness to facilitate widespread cherrypicking by passing through INTELSAT's cooperative pricing structures as described above and in Attachment A.

- In sum, direct access finds support precisely because it would lead to uneconomic bypass of COMSAT. U.S. customers (especially carriers) advocate direct access because it would enable them to lease capacity at advantageous short-term rates, and take advantage of other anomalies in the IUCs, without matching COMSAT's long-term commitment to the INTELSAT system. And some foreign Signatories (like BT) advocate direct access because it would allow them to operate in the U.S. market and free-ride on COMSAT's investment -- while causing them little or no harm in their own countries.

- The only way the Commission could avoid such uneconomic bypass would be by implementing an extraordinarily complex set of surcharges -- which would at best replicate the market prices that COMSAT already has in place. Accordingly, direct access (even with surcharges) would not serve the public interest.

In accordance with Section 1.1206 of the Commission's Rules, the original and one copy of this letter are being submitted to the Office of the Secretary.

Sincerely,



Keith H. Fagan

cc: Donald Abelson  
Howard Shelanski  
Marilyn Simon

## Attachment A

### Effects of Cooperative Pricing

In addition to the basic tendency to price short lease terms too low relative to long lease terms, INTELSAT's utilization charges for its various service offerings contain a number of anomalies. A case in point is INTELSAT's offering of "preemptible" VSAT capacity at discounted charges. This is often cited as an example (indeed, the example) of a service that INTELSAT provides but COMSAT does not. In fact, COMSAT does offer VSAT service, but only on a non-preemptible basis. "Preemptible" VSAT makes no commercial sense because it undercuts other voice and data services that are not offered on a preemptible basis. Indeed, INTELSAT has been forced to put a "cap" on preemptible leases.

Another case in point is INTELSAT's pricing of IBS into very small aperture antennas. In the attached paper, which was submitted to INTELSAT last year (and which was unrelated to the direct access proceeding), COMSAT pointed out that INTELSAT's proposed pricing for this offering included rates for carrier-based services that were at odds with its rates for the same amount of leased bandwidth. This was a distinctly non-commercial result. Yet, despite COMSAT's reservations, INTELSAT went ahead and adopted its proposed pricing structure.

COMSAT's paper also pointed out another non-commercial aspect of INTELSAT's pricing, namely setting a uniform price system-wide despite large differences in the technical characteristics of the transponders used to provide a service. As COMSAT noted, this practice can be fundamentally at odds with maintaining proper relationships between price and resource use. To take a simple example, a service that requires high power should be offered on high power transponders; conversely, a service that requires medium power should be offered on medium power transponders. Offering the same service at one rate on both types of transponders will open the door to cherrypicking and lead to a waste of resources.

Contribution of the  
Signatory of the United States

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JUL 27 1999

BG/PC-79-18E W/8/98  
10 August 1998

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

**COMMENTS AND CONSIDERATIONS ON INTELSAT'S  
IBS TO VSAT SERVICE OFFERING AND THE EFFECT ON INTELSAT'S  
LONG-TERM PRICING POLICIES**

**EXECUTIVE SUMMARY**

1. In December 1997 (BG-120-16), the INTELSAT Management (IM) presented its argument for offering IBS service to the VSAT market. As we all know, IBS is a standardized, full-time, point-to-point carrier service whose wide acceptance, ease of implementation, and high quality was expected to appeal to entry-level data network operators. At the February 1998 BG/PC meeting and the March 1998 Board meeting, the U.S. Signatory expressed concerns about the IM's proposed prices for VSAT IBS, largely because they are below the prices INTELSAT charges for equivalent leased bandwidth. However, in light of increasing competition, the Board approved the VSAT IBS service offering along with the IM's original proposed prices. In addition, the Board also asked the IM to continue to evaluate the competitiveness of these VSAT IBS prices and to come back to the Board should these prices prove not to be competitive.

2. Following its further analysis, the IM now reports that there is little IBS traffic to E-1 stations (which has been in the tariff and available for a long time) and the efforts made to sell this service to the K3 and K2 VSAT stations have been to no avail. As a result, the IM now reports that the VSAT IBS prices are not competitive at Ku-band and should be lowered by 25%. In order to justify this reduction, the IM has changed the way it calculates the space segment power that VSAT IBS carriers are estimated to require at Ku-band (the IM reduced the rain fade assumption and presented this to the BG/T-107 meeting). The IM further submits that there are 65 x 36 MHz units of unused Ku-band capacity in the system which VSAT IBS could help to fill if the prices were lowered. The IM also indicates that VSAT IBS prices are more consistent with equivalent lease prices on IS-VIII series satellites (as well as future generations of satellites) than the IS-VI and IS-VII series satellites.

3. While it is not the intention of this Signatory to impede the IM's efforts to increase satellite fill factors and revenues (in fact, we applaud this effort), we question the framework in which VSAT IBS pricing is being considered. Therefore, we invite the BG/PC to consider an alternative perspective.

## DISCUSSION

4. On the basis of the IM's latest paper (BG/PC-79-9), it is difficult to assess the current state of the market and how to proceed with a pricing policy. Consider the following questions:

- Why did the widely accepted IBS service, for which the IM had such high hopes as recently as March 1998, fail to attract customers, at least at Ku-band?
- Were the prices the only deterrent to better take-up of capacity?
- How do prices, costs, and competition interrelate in this market?
- How is it possible that carrier prices, which are supposedly resource-based, are far below the equivalent price for leased capacity?
- And why would it then be appropriate to lower these prices further by 25%?
- How can the competition cover its costs with prices that are so far below INTELSAT's?
- Is there a general glut of space segment that makes cost considerations irrelevant and does that mean that INTELSAT's principle of resource-based pricing should be abandoned altogether? If so, what new principles should take its place?
- How can the Board determine the correct pricing, particularly when the spread of prices proposed in such a short time span is so large?

The answers to these questions have implications that go well beyond the pricing of VSAT IBS alone. They extend to all of INTELSAT's pricing and to its future service strategy. In the following paragraphs, the U.S. Signatory presents its perspectives on several of these issues.

### *ADDRESSING VSATs*

5. The VSAT market is characterized by networks of earth terminals sharing common space segment, which takes advantage of the inherent efficiency of satellites. As a result, the VSAT service is typically lease-based. Dedicated point-to-point satellite carriers to very small stations are generally not competitive with cables and tend to be provided as part of customized, end-to-end solutions. While the IM claims that there is VSAT demand for a standardized, point-to-point, space segment-only offering, it has shown no analysis of the VSAT market's composition or of the market potential of such a product. In addition, INTELSAT's spacecraft are not optimized for service to very small earth stations, which means that a large amount of transponder capacity is claimed by carriers dedicated to them and that the amount of capacity can vary substantially among the different generations of

INTELSAT satellites. This poses a problem for the IM because it wants to offer this service system-wide at a single price, while at the same time it wants to be price competitive with other satellite operators.

6. In the attached graphs, it is shown that the standardized carrier/uniform price approach taken by INTELSAT of necessity causes: (a) space segment to be offered in a way that may not be fully reflective of resource use; and (b) makes the service non-competitive where alternative providers offer optimized space segment at costs lower than INTELSAT's average price. The analysis also shows that INTELSAT's fractional lease definitions require customers to lease more bandwidth than they actually need to support VSAT IBS service which is implemented according to INTELSAT's technical specifications. This creates a bias in favor of the carrier offering and impairs competitiveness.

7. This Signatory believes that the IM should meet customer requirements in a way that can be priced more reflective of resource use and does not allow the displacement of more valuable traffic on capacity not well suited for VSAT IBS. INTELSAT could achieve this objective and be more competitive if it focused VSAT IBS on the most suitable capacity in the system. There simply is no need to offer this service on a system-wide basis at one specific price.

### ***CARRIER PRICING***

8. It is well known that large earth stations are bandwidth limited while small stations are power limited. For carrier-based services, INTELSAT generally serves large gateway earth stations with spacecraft of general purpose design. The bandwidth requirements of large stations do not vary widely and INTELSAT can offer universal service at globally averaged prices. As INTELSAT begins to address smaller earth station requirements, however, the tension increases between pricing uniformly and reflecting resource use. The VSATs that the IM wants to serve now are as small as 1.8 meters in diameter at C-band and 1.2 meters at Ku-band. That is a long way from the 18 meter Standard A antennas that are the norm for carrier-based service in the system (and for which the INTELSAT satellites were designed). The small antennas consume vastly more satellite power and show a vastly greater *variance* in their power consumption than do larger antennas. Notwithstanding this fact, the IM has consistently maintained that it wants to offer VSAT IBS system-wide at a uniform price.<sup>1</sup> This is fundamentally at odds with both maintaining proper price relationships to resource use and meeting the competition.

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<sup>1</sup> BG-120-16, paragraph 15, "Service Offering," states that the service will be offered on all satellites that IBS is offered. IBS is offered on all satellites. In BG-124-6 it is suggested that VSAT IBS is being implemented in the most suitable transponders. This is a welcomed development, but there is nothing to stop customers from obtaining service in other transponders.

9. Graph No. 1, at Attachment No. 1, shows the factors by which small antennas (at rate  $\frac{1}{2}$  FEC) reduce IBS carrier capacity relative to a Standard A or C antenna (at rate  $\frac{3}{4}$  FEC).<sup>2</sup> The factors are inverse to the loss of capacity: for a 50% loss the factor is 2, implying that the carrier price should be doubled. The range of factors over each station standard results from the variation in carrier capacity given different spacecraft, transponders, and traffic mixes and increases markedly with smaller earth stations. The hash marks within a range indicate the factors (ESCEFs) the IM recommended and the BG/T endorsed for pricing purposes.

10. Selecting a single price point that is competitive and consistent with a wide range of capacity factors is impossible. Most assuredly, that is not what the competition is trying to do. One would expect the competition to try to use optimal capacity for VSAT service and set its prices at the bottom of the ranges. It is, therefore, not surprising to find that INTELSAT's prices are not competitive. In fact, a price reduction by INTELSAT could merely prompt the competition to respond with a price cut of its own and leave INTELSAT still wanting for customers.<sup>3</sup> Recalculating VSAT IBS power requirements based on a new rain fade assumption does not change this fact. It brings down the Ku-band ESCEFs but it also shows that the bottom of the ranges are lower than originally assumed, that the ranges remain wide, and that the ESCEFs selected still leave plenty of room for competitors to under price INTELSAT.<sup>4</sup>

### ***LEASE PRICING***

11. Another problem relates to the way INTELSAT assigns leased capacity. The back-off in power assignments under INTELSAT's partial transponder lease definitions is identical, no matter how a customer uses a lease and is much larger than what INTELSAT assumes for its carrier capacity calculations. The first graph assumes that INTELSAT does the traffic loading and that only IBS carriers or IBS and IDR carriers are in a transponder. For example, the IM calculated that it would need 3.39 MHz to close the link to a C-band H2 antenna for a 512 carrier (at the hash mark), but a customer on an IS-VII would be required to lease 6.94 MHz to do the same.<sup>5</sup> Before INTELSAT introduced its own service, it issued specifications for IBS carriers to VSATs using leased bandwidth, but it did not change the

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<sup>2</sup> The graph is reproduced from BG/T 98-19E W/5/96, Addendum No.1 and shows both C-band and Ku-band factors with the original rain fade assumption.

<sup>3</sup> The IM is aware that it is pitting average prices against marginal cost, see BG-124-6, paragraphs 6 and 9.

<sup>4</sup> The new ESCEFs are near the bottom of the old ranges, but by INTELSAT's new method, which the BG/T still has to approve, the entire range shifts down, and the price would not correspond to the bottom of the new range (see BG/T Temp. 107-108E; BG/PC Temp. 79-107E, Figure 1). Moreover, other companies may have lower ranges as their spacecraft may be designed specifically for service to VSATs, which INTELSAT's are not.

<sup>5</sup> Data supplied by INTELSAT.

power assignments for leases used according to these specifications. The customized lease approach to serving VSATs thus was not enhanced in a substantive way. Graph No. 2, at Attachment No. 2, depicts the extra resource a customer would have to lease in order to put up a 512 carrier with various earth stations.

12. At Ku-band on an IS-VIII, a lease would actually require less bandwidth than implied by the BG/T endorsed efficiency factor (at the hash mark), but the IM still priced many of the carriers so that they are cheaper. The IM depressed the price of carriers compared to leased bandwidth. Converting the 5-year IUCs for a 512 Kbps carrier to a price per MHz and comparing it to the 5-year price per MHz listed in INTELSAT's lease tariff, produces the relationships shown in Graph No. 3, at Attachment No. 3. At rate  $\frac{1}{2}$  FEC, INTELSAT is charging less for carriers than for bandwidth (assuming the bandwidth requirement per carrier implied by the BG/T approved factors) and the gap widens as the antenna gets smaller. This means that the VSAT IBS prices fail to compensate for the loss of capacity not only in the cases above the hash marks of the first graph but for many cases below the hash marks as well.<sup>6</sup>

#### IMPROVING VSAT IBS

13. The difficulty that INTELSAT encounters in attempting to be both a universal service provider at a uniform price and competitive at the same time is understandable. For example, an E-1 carrier to a K2 station could displace as many as 196 IBS/IDR channels, given INTELSAT's new rain fade assumption (261 with the old), and an E-1 carrier to an H2 station could displace as many as 290 channels. If VSAT IBS is not priced correctly, this could be a very bad trade for the system. On the other hand, prices that are not premised on the best capacity INTELSAT has to offer for VSAT IBS will have a poor chance against the competition. Hence, a choice has to be made.

14. Assuming the choice is to be competitive, there are two approaches INTELSAT could take. Firstly, INTELSAT could lease bandwidth with the proviso that, if the end user complies with INTELSAT's VSAT Business Services Module (IESS-312), it will be assigned more power than it would under the standard technical lease definition. In this way, customers would pay for the resource they actually need and have the benefit of a service with well defined, standardized technical performance characteristics. INTELSAT's concern

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<sup>6</sup> Consider the comparison to revenue potentially displaced from carriers going to large earth stations: A 512 carrier received by a K2 station, in the worst case (at the top of the range), would displace 69.6 64Kbps IBS channels received by a Std. C station at  $\frac{3}{4}$  FEC. Assuming a 5-year term, these 69.6 IBS channels, at the 512 carrier IUC, would generate \$19,836 per month. For the efficiency factor approved by the BG/T (at the hash mark), the 512 Kbps carrier would displace 60.3 regular channels generating \$17,185 per month. But, the price of the 512 IBS carrier at rate  $\frac{1}{2}$  FEC to a K2 antenna is only \$13,187.

that too many customers expect the IM to do the network design work for them when they order leased bandwidth, particularly with small leases, can be satisfied. INTELSAT could provide carriers as it would if they were ordered off its carrier tariff, but charge for them according to the leased bandwidth consumed.

15. As a second suggestion, given the apparent need for an IM-managed product, the IM could earmark the most suitable space segment in terms of technical attributes, traffic loading, and market coverage and offer to lease channels in that capacity at resource-based prices. The prices in the optimized transponders would be at or near the bottom of the ranges and not be available elsewhere in the system. Should the IM be successful in marketing this capacity for VSAT use, they could even lower the ranges by having transponders on future spacecraft tailored for VSAT service. The prices that result with tailored capacity could be lower than those now in effect (or even than those proposed) and stand a better chance of being competitive.

16. We believe that either approach outlined above would be fully compliant with INTELSAT's obligations under the INTELSAT Agreement to provide service on a non-discriminatory basis, and that the second approach is indeed already consistent with current practices for certain other services.

#### **FURTHER CONSIDERATIONS**

17. In support of its proposed price reduction, the IM reports that there are 65 x 36 MHz transponders of empty Ku-band capacity in the system and suggests that a VSAT IBS price reduction will help to fill them. Such a large amount of empty capacity deserves an analysis in its own right. If there is truly excess capacity at Ku-band in significant quantity, then consideration should be given to lowering the lease prices for this capacity. INTELSAT already has criteria in place for discounting "unloved" capacity; if these are not adequate for dealing with excess supply at Ku-band, then this policy should be revisited. INTELSAT should not allow excess supply to exist in the system by keeping its lease prices too high and then observe that new offerings have no "opportunity cost" and would make a positive contribution *at any price*.

18. Competitors have liberties that INTELSAT does not enjoy and may set low prices in the short run for idle capacity and subsequently raise their prices or discontinue an offering altogether. They do not commit themselves to a service definition with a fixed price for all customers. INTELSAT must avoid chasing the competition's short term price movements with permanent, system-wide offerings. VSAT IBS, as defined, is a permanent offering available system-wide in any carrier size up to 8 Mbps and for any lease term up to 15 years. Its pricing should stand in the proper relationship to lease prices and other carrier offerings. Promotional discounts may be appropriate but should be time-limited and conditioned not to distort INTELSAT's long term structure of prices and service commitments.

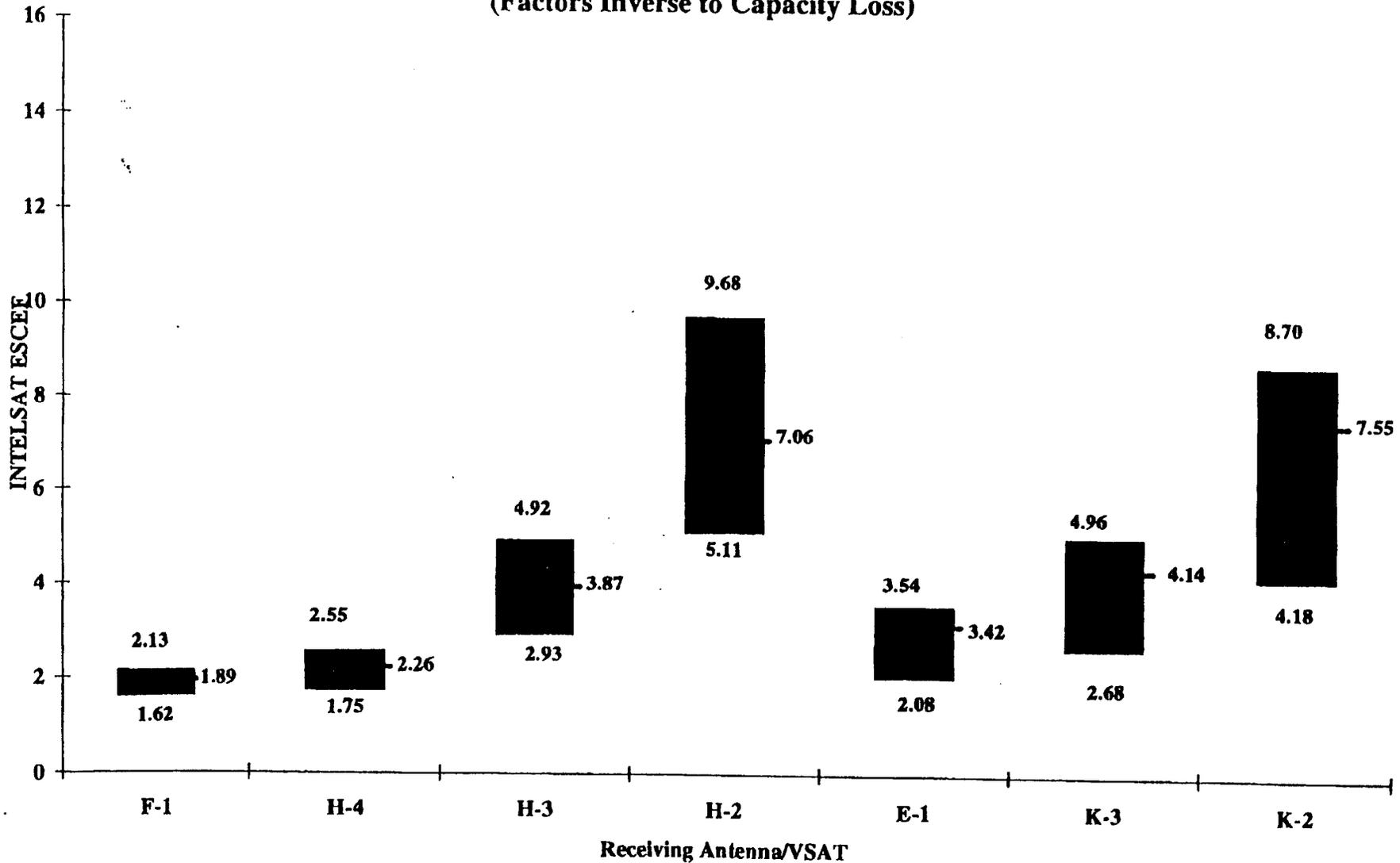
19. The IM indicates that its carrier pricing is more consistent with lease prices on the IS-VIII series satellites (which have higher power than the older series satellites) and it has been suggested that carrier pricing should properly be driven by the newest series. The view here is not inconsistent with that principle—service requiring high power should be offered on the highest power capacity, which may mean an IS-VIII satellite or an IS-VII or other satellite depending on the requirement. Just as important, however, it must be recognized that INTELSAT serves predominantly large earth stations with space segment designed for that purpose and will continue to do so for many years to come. Even if large station traffic is not growing overall, it is indisputable that some connectivities are congested. Hence, if the IM wants to serve small stations as well, it must manage the allocation of space segment between the large and small earth station communities to its best advantage. It should not offer service that requires high power on medium power capacity just as it should not offer medium power service in high power transponders. To do so would be a waste of resources. Therefore, the concept and delivery of a new service should be designed for the capacity most suitable to its provision. Over time, the capacity selected may be optimized to the service. That is the way to become competitive.

## CONCLUSION

20. This Signatory believes that the IM should set carrier prices consistent with lease prices, address short term objectives with short term pricing, and assign different types of space segment to their optimal uses. If INTELSAT is serious about competing in the VSAT market with a carrier service, it should select its best capacity for this purpose and charge cost-based prices for it. That means it may be able to set prices lower than currently in effect or proposed, but not on a system-wide basis. INTELSAT should also recognize that, generally, the VSAT market is a leased bandwidth market and should reevaluate how to allocate power to lease customers to assure they do not have to order more resource than they need when buying from INTELSAT. Under competition, pricing policies become more complex than setting average ESCEFs, especially with multiple services and uneven cost profiles. In the future, the Board will require more information about market conditions and costs in order to assess proper pricing policy.

Graph No. 1

**VSAT INEFFICIENCY FACTORS, RELATIVE TO STANDARD A,C**  
**(Factors Inverse to Capacity Loss)**

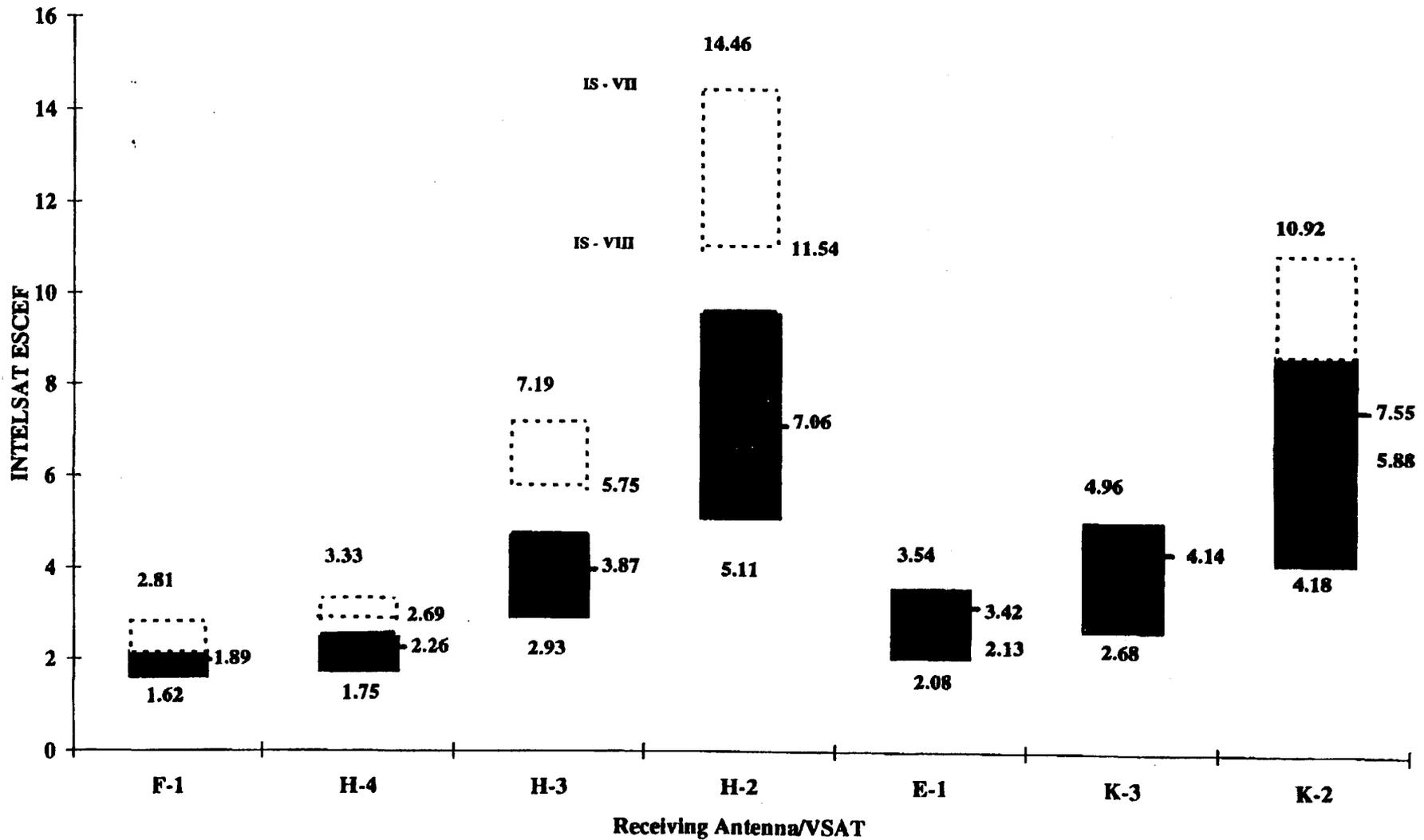


Note: Intelsat is using a 64 Kbps QPSK modulated, rate 3/4  
1/2 EC carrier as a unit of capacity measure.

Source: Reproduced from BG/T 98-19E W/5/96 Addendum No. 1

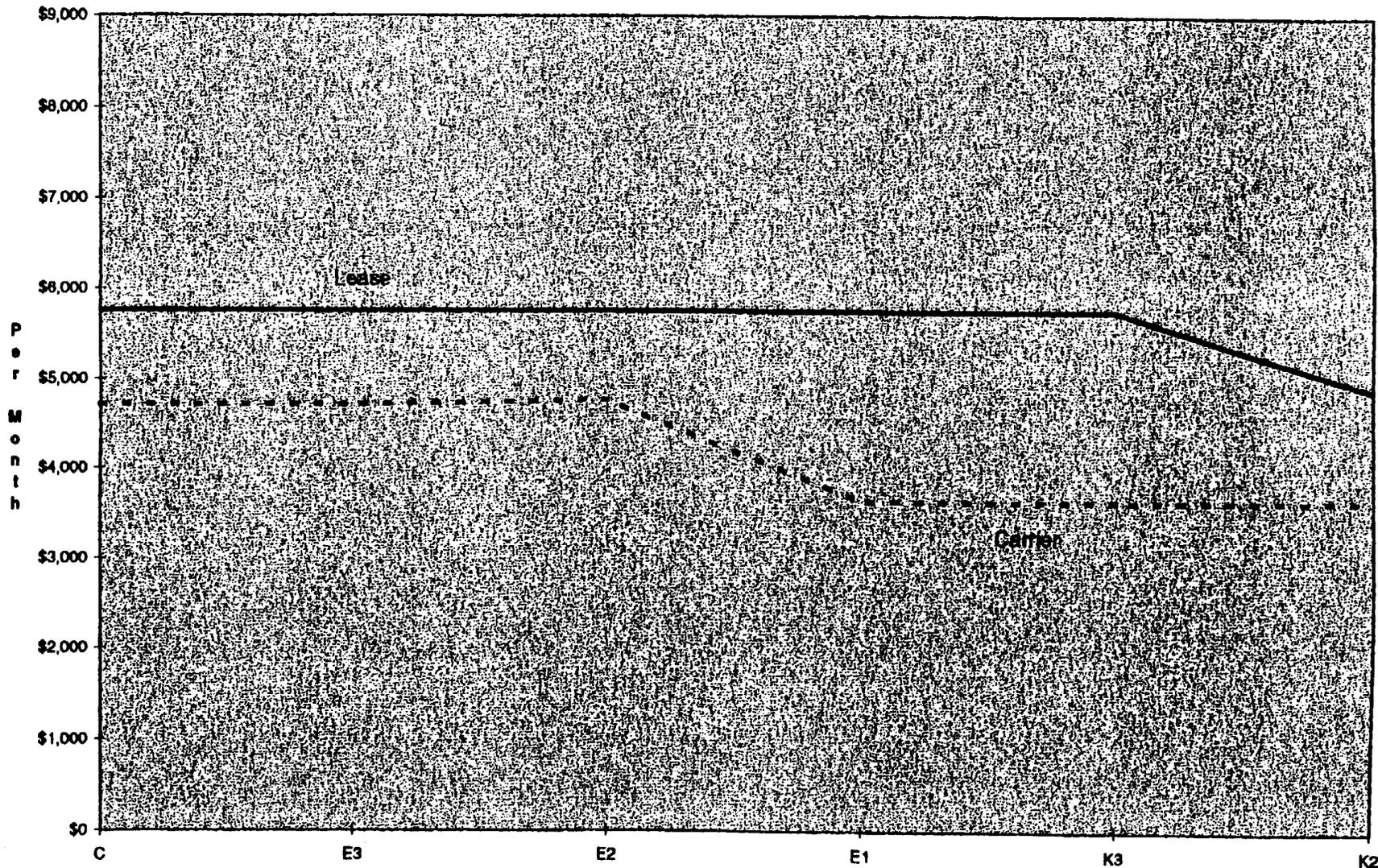
Graph No. 2

**VSAT INEFFICIENCY RELATIVE TO STANDARD A,C**  
**Factors Implied by Lease Definitions Shown as Dotted Lines**



Graph No. 3

K-band 5-Year IUC/MHz  
IM, BG/T ESCEFs



512 Carrier

## Attachment B

### COMSAT Customer Initiatives

The following are examples of services offered by COMSAT but not by INTELSAT and/or services offered by INTELSAT only at the urging of COMSAT.

- Long-term leases: COMSAT started offering long-term leases at reduced prices in the mid-1980s when INTELSAT was still providing services only on a month-to-month basis.
- Global flexibility: Since 1987, COMSAT's tariffs (as well as its contracts with AT&T, MCI and Sprint) have allowed carriers to relocate circuits taken under multi-year lease anywhere in the world. INTELSAT's policy had been much more restrictive until recently.
- Two- and three-year lease terms: Until recently, INTELSAT offered private line services only for one- and five-year lease terms. COMSAT began offering 2- and 3-year terms years ago in response to customer demand.
- Inclined-orbit service: COMSAT invented the "COMSAT maneuver" for extending satellite life through inclined orbit operation in the 1980s, and pioneered the use of discounted rates for inclined-orbit service.
- Cable restoration: With the advent of fiber-optic cables in 1988, COMSAT responded to customer demand by developing a low-cost cable restoration service based on an annual reservation fee (as opposed to high per diem rates).
- VSAT service: In the late 1980s, COMSAT led the way in persuading INTELSAT to offer VSAT service -- a service in which foreign Signatories initially had little interest. In the early 1990s, COMSAT also put together the multi-Signatory agreements that allowed AT&T and MCI to create VSAT networks on the INTELSAT system.
- Pre-launch rates for INTELSAT K: In 1991-92, COMSAT offered discounted pre-launch rates for the INTELSAT K satellite, even though INTELSAT made no distinction between pre- and post-launch rates. Pre-launch rates, of course, are a staple of commercial satellite service pricing. (Significantly, INTELSAT later did adopt pre-launch rates for the K-TV satellite -- but only

because that satellite was being transferred to a commercial company, New Skies.)

- Digital video service: In the early 1990s, COMSAT successfully encouraged INTELSAT to offer digital video service. COMSAT also offered its customers special terms and conditions to ease the transition from analog to digital service.
- Incremental activations: At around the same time, COMSAT persuaded INTELSAT to allow incremental activations of digital capacity, rather than require customers to lease entire transponders from the outset. This has greatly increased the takeup of such capacity.
- Circuit months: Since 1993, COMSAT's service contract with MCI has allowed MCI to order monthly circuits at discounted rates if it commits to a minimum number of circuit months. INTELSAT has nothing like this offering.
- TDMA discounts: In the mid 1990s, COMSAT convinced INTELSAT to offer discounts as an incentive to implement 2nd generation TDMA service. COMSAT also provided promotional discounts to each of its TDMA customers, even though it got only one such discount from INTELSAT.
- Quality of service: In the mid 1990s, COMSAT developed the "outer codec" that made it possible to improve IDR service quality to the same level as fiber-optic cables. COMSAT also persuaded INTELSAT to upgrade its quality standards (e.g., BER rates) to fiber-optic levels, and was also active in standards-setting bodies to ensure that digital protocols were satellite-compatible.
- Contract occasional use service: Years before INTELSAT, COMSAT offered reduced rates for "recurring" occasional use television service. COMSAT also offers reduced rates to occasional use customers willing to pre-commit to a minimum number of minutes, even though its effort to convince INTELSAT to offer similar reductions was defeated due to opposition from other Signatories.
- U.S. Government service: In 1995, COMSAT developed a special tariff (CWS Tariff 2) in response to a U.S. government's RFP seeking favorable terms for high-volume use. INTELSAT does not have (and cannot have) any special terms for the U.S. government.