

A Perspective On the 1985
Space Conference ORB-85

by William H. Montgomery

Do not quote without the permission of the author.
©1984 Columbia Institute for Tele-Information

Columbia Institute for Tele-Information
Graduate School of Business
Columbia University
809 Uris Hall
New York, NY 10027
(212)854-4222

A PERSPECTIVE ON THE 1985
SPACE CONFERENCE ORB-85

by

William H. Montgomery

Director General
International Relations
Dept. of Communications
Government of Canada

November 1984

This paper was presented to a conference entitled: Tracing
New Orbits: Competition and Cooperation in Satellite Develop-
ment.

Research Working Paper Series, not for citation, quotation,
reproduction or distribution without written permission.
All papers represent solely the author's view and not
necessarily that of the Research Program or its affiliates.



NOTES FOR A STATEMENT BY W.H. MONTGOMERY

Columbia University Conference-November 30, 1984

"Tracing New Orbits: Competition and Cooperation in Satellite Developments"

A Perspective on the 1985 Space Conference ORB-85

1. Historical perspective on frequency planning in the ITU -

- The ITU has regulatory and distributive responsibilities in establishing suitable regulations to control the use by its members of the radio frequency spectrum.
- International regulatory regimes for the use of the spectrum are established at ITU Radio Administrative Conferences where solutions are sought to conflicting regulatory approaches among member countries.
- Technological developments in telecommunications have ~~also~~ put a strain on, and encouraged, creative and innovative means of meeting the needs of spectrum users.
- While technological developments solved certain frequency congestion problems, demand for immediate access to this scarce resource by technologically advanced administrations, and concern by developing countries to ensure access to it when needed, have led to differing views on how to regulate and distribute certain frequencies.

- Up to the mid-70's administrations were able to satisfy their anticipated requirements with a fairly rigid approach to frequency planning for certain services. This approach accommodated requirements submitted to particular conferences but did not include modification provisions for the interim period between conferences.

- A major turning point in frequency planning was the 1974 Maritime Mobile Services WARC which introduced flexibility into the a priori planning process by adding a procedure for new entries to the plan as needs evolved.

- Another point came at the politically sensitive 1984 High Frequency Broadcasting WARC which adopted planning principles, and a method embodying the major features of plans leading up to this Conference. Additional flexibility was introduced in the areas of defining equitable access and satisfying basic requirements, as well as protecting frequency continuity and quality of service.

- The question at WARC-ORB-85 is less one of whether to plan but how much rigidity is needed in planning the fixed satellite service in order to provide a credible guarantee of access to the orbit, and what sort of planning method best serves the domestic, regional and global interests of ITU member countries.

- developing country concerns regarding the availability of the spectrum when they require it, without an undue and unreasonably costly technological burden,
- satellite operating country concerns to ensure immediate and continuing access to spectrum resources, as well as those relating to developing procedures for technological change, accommodation of existing systems, etc; and
- regional and intergovernmental satellite organization requirements.

3. Canadian perspective

- The majority of ITU member nations view the current spectrum regulatory regime as inequitable in the face of a potential shortage of spectrum/ orbit resources.
- WARC-ORB-85 is seen as an opportunity to redress this perceived imbalance in favour of the developed nations, and conversely, as an opportunity to retain as much flexibility in allocation of orbit resources as possible to ensure continued access to it by technologically advanced nations.
- In preparing for the Conference Canada is taking the view that discussion of planning principles cannot ~~not~~ be avoided.

- A working document was drawn up with these concerns in mind and is being discussed bilaterally and regionally with a view to soliciting views and comments of interested administrations.

- The ideas presented in the Canadian working document should be seen in terms of their representational character, i.e. in terms of a concept encompassing the major points we believe need to be addressed at the Conference.

- These ideas are based on discussions with various administrations and reflect the breadth of interests of the major users while meeting the objectives of most ITU member countries in providing reasonable assurances of access to the geostationary orbit.

- Our objective in putting forward these ideas is to help lay the groundwork for development of workable proposals for the Conference.

- Whatever planning approach is eventually adopted, regulatory procedures are likely to further emphasize the IFRB's role as ^d "guarantor" of access to the spectrum. How this role will be defined will depend on the major features of the approach to frequency planning and associated regulatory procedures that will be included in the outcome of the '85 conference.

Characteristics of
An A-Priori Planning Method
For the Fixed-Satellite Service

I. Preamble

This a-priori planning method is intended for application to the fixed-satellite service in the heavily-used 6/4 GHz and 14/11-12 GHz bands. This planning method is seen to be a priori and flexible at the same time because it strikes the best balance between seemingly contradictory requirements of providing long-term guaranteed access by administrations* to the use of the geostationary orbit, while allowing sufficient flexibility to introduce cost-effective state-of-the-art systems.

This planning method responds to the need of administrations to have enough spectrum/orbit resource reserved in a precise way for their use when required and at the same time allows management of that spectrum/orbit resource to be responsive to the latest technical innovations available. It does this by specifying a minimum number of parameters, i.e. orbit position, frequency band, and service area, and allowing all other parameters such as antenna characteristics, interference limits, modulation characteristics, spacecraft station-keeping and pointing-error characteristics, etc., of the satellite networks to be determined at the time that those networks are implemented. This results in the maximum possible flexibility within the context of an a priori plan.

Under this method an a-priori Plan will be developed at the 1988 Space WARC, which will assign specific orbital positions and frequency bands to each administration. As a result, the method allows implementation of state-of-the-art networks to be coordinated under the Plan, and avoids the need to specify the detailed characteristics of these systems in 1988 long before they are designed. This balance, or one very close to it, will have to be adopted by WARC-ORB if there is to be an orderly and effective use of the geostationary orbit by the fixed-satellite service in the 1990's. This is consistent with the objectives of Resolution 3 of the ITU Radio Regulations.

II. Characteristics of the Plan

1. Development of the Plan

The formulation of the Plan will be based on requirements requested by administrations. These stated requirements will include the frequency bandwidth, the service area, and the service orbital arc of each required network. Separate sets of requirements would be submitted and accommodated for the 6/4 GHz band and the 14/11-12 GHz band, with account taken of the need to meet certain requirements with multi-band hybrid satellites. The number of orbital positions assigned to an administration in the Plan would be determined by the Conference and would be based on the requirements submitted by that administration.

* The term "administration" in this paper should also be taken to mean "group of administrations".

orbital positions, frequency bands, and service areas specified in the Plan. Coordination will be based upon the latest CCIR Recommendations or technical criteria agreed to by the parties concerned. For the majority of cases, it is expected that the systems to be implemented will fall within the set of parameters identified with the original requirement.

- b) In exceptional circumstances, where coordination cannot be readily completed, the IFRB will convene a special meeting of the administrations involved in the original coordination to find a means by which the proposed system shall be accommodated. At such a meeting the onus of accommodation shall be shared both by the administrations of existing networks and the administration wishing to establish the new network.

5. Plan Modification Procedure

A modification procedure would be part of the administrative procedure associated with the Plan, to be used where required to make additions, deletions, or changes to the basic parameters of the entries in the Plan, i.e. to the frequency bands or sub-bands, orbit positions, or service areas. Modifications would be subject to agreement of affected administrations. The examination of such proposed modifications would take into account the actual characteristics of systems that are already operational or coordinated, and the characteristics originally assumed in the Plan for all other entries.

The modification procedure would also be used whenever a change to the basic parameters of the Plan was required as a result of the coordination process.

6. Duration of the Plan

The resulting Plan would be in effect for a minimum of ten years, and would be subject to review after that time. It would remain in effect until such time as it is replaced by a new agreed Plan. The ten-year duration is the expected interval over which its technical basis would reflect the technology used to implement actual systems.