

Recommendation for the Organizational and Functional Structure of ALMA in Chile

Prepared by: North American Representatives to the ACC
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1. Executive Summary

We reassess the arguments presented for organizing ALMA in Chile either “under the ESO umbrella” or through “autonomous entities united by convention”. We highlight our concern that the ACC have a clear definition of the structure of ALMA to present to the Chilean representatives at the July 2001 meeting. We find the arguments easier to understand if we distinguish the “organizational structure” of ALMA in Chile from the “functional structure” of ALMA in Chile. Using this technique we illustrate the two organizational concepts. We strongly prefer organizing ALMA in Chile as “autonomous entities united by convention”. The strengths of this concept are:

- It accurately represents the ALMA partnership as the joint efforts of three partners;
- It visibly respects the equality of the partnership;
- It preserves the roles of the Executives to involve their staff, and their community, in ALMA;
- It reserves for the Executives the discretion to carry out their ALMA responsibilities in a manner that they deem most beneficial to their particular institution;
- It broadens the resource pool available to solve problems or generate new ideas thereby minimizing risk and helping to assure a successful, long-term, stable, research enterprise.

2. Background: Purpose of this Document

In July 2001 chosen representatives of the ALMA Coordinating Committee (ACC) will have the opportunity to meet with officials of the government of the Republic of Chile and discuss the conditions under which ALMA may be built and operated on the Chajnantor site in Chile. We believe that these discussions cannot progress favorably unless the ACC can present to the Chileans a clear, and united, view of the ALMA project and make our requests for ALMA to them as precisely as possible. Presently, it is our view that the ACC is not in a position to make such a request. Hence the purpose of this document is to attempt to redress those deficiencies in areas where we see our collective understanding regarding ALMA to be either lacking or subject to very different interpretations. If we can clarify such issues for ourselves, we should be able to present them suitably and understandably to the Chileans.

For more than a year, the ACC has actively discussed issues related to the organization of ALMA in Chile and the legal regime (i.e. the nature of the permissions from Chile) under

which it could operate. On three occasions over the past year the ACC has formally requested individuals or working groups to prepare written assessments of the issues involved in structuring ALMA in Chile, or on options for amelioration of those issues¹²³. All three of these reports should be viewed as attachments to the present document, a document which is written in response to the fourth formal request from the ACC for still more perspective and analysis. Because the information needed for an informed discussion of the alternatives exists in the earlier documents, it is the goal of this report to highlight the two principal options in enough detail that a recommended approach for the organization of ALMA can be made by the ACC and supported in the forthcoming discussions with the Chilean representatives.

3. Nature of the Problem

ALMA is intended to be a long-lived, 30 years or more, research facility done as a partnership between North America, Europe and Japan and located in Chile. If indeed long term stability is to be achieved, the interests of all those involved need to be respected. That is, all parties involved with ALMA should feel that ALMA is of benefit to them in proportion to their contribution or involvement with the project. Our problem concerns the large number of such interested parties. They include:

- The three partners to the project;
- The agencies providing the funding;
- The Executives who bear the burden of responsibility for execution of the project;
- The scientific communities;
- The Republic of Chile
 - Scientists and the science agency, CONICYT;
 - The Ministry of Foreign Affairs;
 - The Ministry of National Assets;
 - The officials and citizens of Chile Region II.

In the interest of long term stability, it should be the goal of the discussions between the ACC and the Chilean Representatives to assure that all these entities feel as if they “win” as a result of the ALMA Project in one way or another. Understandably, each of these entities will examine the organizational structure we propose in July to see the benefits and liabilities for their particular interests.

Our fundamental problem in addressing concerns raised by many of these involved entities, particularly those in Chile, has been that we have not been able to define ALMA with sufficient precision for them to evaluate whether ALMA is, to their interests, something to be embraced or opposed. The proper place to start this discussion is therefore with a definition of ALMA. But unfortunately we do not have such a

¹ ALMA Legal Organization: Task-Based Options. Report of the ACC Working Group on ALMA Legal Organization in Chile, 12 June 2000.

² The Organizational Structure of ALMA in Chile. White Paper on ALMA in Chile, R. Giacconi, 10 January 2001.

³ Report to the ACC of the Working Group on the Organization and Representation of ALMA in Chile, 31 March 2001.

definition. For example, the draft ALMA Agreement defines ALMA with a circular argument, “ALMA means the collaborative project involving the Construction, Commissioning, and Operation of the Atacama Large Millimeter/submillimeter Array”. Given this situation, we propose here to *derive* a working definition of ALMA from the two models that have been created for its organizational and functional structures in Chile.

Figure 1 is a visual representation of the problem. The top part of this figure, the ALMA organization in North America, Japan and Europe, shows all the entities of the ALMA Project that are specified in the draft ALMA Agreement. The 3 “Partners” plus a representative from Chile, make up the ALMA Board. The Partners each appoint an Executive Agency to conduct their assigned ALMA responsibilities. The Executives are legal entities. Their work, in the construction phase of the project, is coordinated but not managed, by a joint “Project Office”. The ALMA Board has the ultimate management authority. The ALMA Board receives advice from a science advisory committee and a management advisory committee. The ALMA Board is not a legal entity.

As this figure emphasizes, the ALMA entity in Chile remains to be defined. Somehow, that entity in Chile must deal with ownership of the ALMA assets, it must carry out the administrative and operational tasks, employ staff, and conduct itself in accord with the legal permissions and immunities negotiated for ALMA with the Republic of Chile. The documents referenced above as footnotes 1-3 present two alternative ways to construct the lower half of Figure 1. We discuss them in turn below in sections 4 and 5 respectively. For each, we distinguish between “organizational structure” and “functional structure” which more completely highlights the differences. Finally, we conclude each discussion with a definition of ALMA that is derived from the organizational and functional structure.

4. The Multi-lateral ALMA Project Organized in Chile “Under the ESO Umbrella”

ESO has proposed to use its existing treaty with Chile as a vehicle to establish the legal basis for ALMA in Chile. Figure 2 is an illustration of this concept.

ESO has successfully operated its observatories in Chile for nearly forty years. The La Silla Observatory was specifically referred to in the ESO-Chile treaty of 1963. In order to build the Paranal Observatory (VLT/VLTI) ESO requested, and obtained, an amendment to the treaty that permitted ESO to form a new center of observation. This amendment required and received ratification by the Chilean Parliament in 1995. The specific ESO proposal for ALMA is to once again employ the same approach, i.e. seek an amendment to the treaty for a new center of observation. However, this time that proposed amendment would specifically note that ALMA is to be done with ESO acting on behalf of the partnership with AUI and NAOJ. And in addition, this observatory would also be done with a closer collaboration with Chile than had been the case with the earlier ESO observatories. If successful, the amendment would establish a third ESO observing site.

As illustrated in Figure 2, the role of Japan and North America in this model is to provide funding to ESO for operation of the observatory. In addition, if suitable permissions could be negotiated with Chile, Japan and North America could also import materials. The functional structure is better represented in Figure 3.

In Figure 3 it is made explicit that the ALMA Observatory for which ESO would receive permission to build and operate by virtue of its treaty amendment, is the physical observatory. It is the antennas, instruments, buildings, roads, all the tangible assets. AUI and NAOJ would be represented in the operation of the observatory by (1) providing their share of the funding; and (2) assigning staff to the observatory. The observatory staff—from AUI, NAOJ and ESO—all would be hired by a corporation for Chilean affairs that was either formed by AUI, ESO and NAOJ or jointly engaged by these entities. Use of the corporation assures that all staff are treated and compensated in a uniform manner. They would all work under Chilean labor laws, for example. For the administrative tasks of dealing with the government a small group of ESO personnel, employed under ESO permissions, would be used.

In this model, the working definition of ALMA is this: *ALMA is an observatory established by ESO by means of an amendment to the ESO-Chile treaty. ESO will operate ALMA in partnership with AUI/NRAO and NAOJ and in collaboration with Chile.*

5. The Multi-lateral ALMA Project Organized in Chile by “Autonomous Entities United by Convention”

AUI has proposed an organization for ALMA in Chile that is based on the ability of each of the Partners to negotiate their own permission for ALMA. Figure 4 is an illustration of this concept.

The fundamental precept is that each of the three partners secure permission to participate in ALMA under the specific terms outlined in a project foundation document, or *convention*. The convention would define the respective roles of each of the partners, their tasks in construction and operation, the relation of the partners to the whole of the project, the relation of the partners to each other, and the relation of each to the Republic of Chile. Eventually the convention would be signed by the partners and Chile. The convention is not a legal document.

Prior to the formation of ALMA, AUI had negotiated permission to build and operate in Chile the *Millimeter Array* project, a project that became one of the design antecedents of ALMA. The permission, granted by the unilateral action of the Republic of Chile through Public Law 15172, is identical to the permission used by AURA and Carnegie to operate observatories in Chile for 35 years. Permission under Law 15172 has been used even more recently by Caltech to build and operate the Cosmic Background Imager on the Chajnantor site. It is likely that AUI would want to amend its permissions for the specific purposes of participation in ALMA; that amendment would need to be reviewed

by the Ministry of Foreign Affairs in light of the role assigned to AUI according to the convention.

NAOJ presently has no permissions in Chile. They would seek such permission under Law 15172, again presenting as part of that application their ALMA roles and responsibilities as stated in the ALMA convention.

ESO would need to amend their treaty to participate in ALMA according to the roles and responsibilities agreed for it in the ALMA convention. However, the early exposure of members of the Chilean government to the proposed roles and responsibilities for ESO as contained in the draft ALMA convention, and the opportunity for ESO to respond to their suggestions, should speed the approval process for the amendment.

Thus the organizational “coming together” in Chile of the three ALMA partners occurs with agreement to the ALMA Partnership Convention, and of course agreement of Chile to the Convention. Thereafter, the problem is in establishing a functional structure for ALMA in Chile.

The functional structure for ALMA in Chile is illustrated in Figure 5. Here the important ideas are:

- ALMA operates by the cooperative efforts of the three Executives, AUI, ESO and NAOJ;
- Each of the Executives is responsible for importing the materials they build for ALMA, and for maintaining ownership and accountability of those materials in Chile;
- Each of the Executives is responsible for assigning to ALMA construction and operations the staff necessary to carry out the tasks for which they are responsible;
- Each of the Executives is responsible for contracting for those services they need to carry out the tasks for which they are responsible;
- The Executives will carry out their ownership responsibility of common tangible assets in Chile (e.g. buildings, roads, utilities, etc) in accord with the provisions of the ALMA Partnership Convention;
- The Executives will jointly form, or engage the services of, a single corporation for Chilean affairs. It will be the task of that corporation to hire local Chilean staff for the three Executives under one agreed set of labor conditions;
- The tasks and responsibilities of the Executives in Chile will be managed by a single Director’s Office. All the staff assigned to ALMA by the Executives, or procured for ALMA through the Corporation for Chilean Affairs, will report to the ALMA Director’s Office. The ALMA Director reports to the ALMA Board.

Thus, the foundation for the “Autonomous Entities United by Convention” model for the functional structure of ALMA is the ALMA Partnership Convention and the ALMA Director’s Office.

The ALMA Partnership Convention will specify:

- Ownership of tangible assets;
- Legal relationship of the staff, assets, or liabilities of one Executive to the others;
- The role of the Corporation for Chilean Affairs, and the relation of the Executives and the Director's office to that corporation;
- The agreement of the Executives that they will assign to management by the Director those resources (staff and materials) necessary to carry out their tasks as set forth in the annual ALMA Program Plan and approved by the ALMA Board;
- The agreement of the Executives that they will provide the resources needed to support the work of the Director's Office;
- The agreement of the Executives to share resources and coordinate employee compensations and working conditions;
- The agreement to coordinate contracting in Chile through the Director's office;
- The agreement to assign to the Director's office responsibility for representation of the project to the Chilean government subject to particular guidelines or exceptions;
- The agreement that the affairs of the Executives will be assigned to the Director's office subject to particular guidelines or exceptions.

The Director's Office is the body that coordinates the work of the Executives and serves as the "face" of ALMA in Chile. It is composed of the Director, an Administrative manager, and administrative staff. Tasks thought of as "common" observatory tasks, tasks such as public relations or safety, will be done as tasks of the Executives set forth as agreed in the annual observatory Program Plan prepared by the Director and presented for approval to the ALMA Board. The specific tasks of the Director include:

- Coordinate the activities of the three Executives
- Maintain the ALMA operations WBS and schedule;
- Assure that all scheduled work is completed in a timely manner and done to the specifications agreed;
- Facilitate the work of the Executives;
- Provide an impartial, and consistent, determination of observatory costs;
- Negotiate an adjustment of "valued" task cost estimates in the face of experience where necessary;
- Serve as a "scorekeeper" to assure that the valued contributions of each Executive remain on a par with those of the others. Recommend remedial action where that is necessary;
- Seek to resolve disputes between the Executives;
- Represent ALMA to Chilean officials;
- Serve as the interface to ALMA for Chilean industries, universities, and civil agencies;

The Director and each of the individuals in the Director's Office are employees of one or another of the Executives. The Director and any other professionals in the Director's Office report to the ALMA Board.

The Director's Office is funded by the Executives in a manner and amount agreed to annually by the ALMA Board.

The Director's Office is not a legal entity.

The working definition of ALMA in this case is: *ALMA is the merger of three independent array telescope projects—the U.S. Millimeter Array (MMA), the European Large Southern Array (LSA), and the Japanese Large Millimeter and Submillimeter Array (LMSA). By agreement of the three agencies sponsoring the individual projects, a single merged project, ALMA, will be built and operated jointly by the observatories (or “Executives”) that had the prior responsibility for the MMA, LSA and LMSA projects respectively. For ALMA, the three Executives will perform different, complementary, construction and operational tasks. Their effort will be coordinated and managed by a single ALMA Director in Chile assisted by an administrative staff.*

ALMA, in construction and operation, is entirely the sum of the efforts of the three Executives. ALMA is not a legal entity. ALMA has a Director (and supporting administrative staff), but it has no employees and no tangible assets. The employees working on ALMA are employees of the Executives; the tangible assets are assets of one or another of the Executives.

6. Conclusions

The North American side of the ALMA partnership strongly favors an organization of ALMA in Chile based on “autonomous entities united by convention”.

The strengths of this concept include:

- It accurately represents the ALMA partnership as the joint efforts of three partners;
- It visibly respects the equality of the partnership;
- It preserves the roles of the Executives to involve their staff, and their community, in ALMA;
- It reserves for the Executives the discretion to carry out their ALMA responsibilities in a manner that they deem most beneficial to their particular institution;
- It broadens the resource pool available to solve problems or generate new ideas thereby minimizing risk and helping to assure a successful, long-term, stable, research enterprise.