

A Common U.S. View of Our Goals for the Organization of ALMA in Chile?

R. L. Brown
26 June 2001

1. The Problem

Since we received Ian Corbett's latest (21 June) note on *The Organizational and Functional Structure of ALMA in Chile*, I have had the chance to discuss the document, briefly, with Paul, Pat, Eduardo and Bob Dickman. While all of us have reservations about what is in Ian's document, and what is not in it, my impression is that we do not necessarily share a common view of how we would like that document revised. That is, we seem not to share a common view of what we would like to achieve for the organization of ALMA in Chile. This, of course, makes it very difficult to respond constructively to Ian.

In this note I would like to take the opportunity to illustrate what I think we should be trying to achieve and why. Let's use this "analysis" to identify the source of our disagreements—perhaps these are but superficial. I'll start with an insightful point Bob Dickman made in his email of 25 June regarding the desirability (in his view) of locating "top notch" ALMA staff outside of Chile. I'll go from there to how I see ALMA looking outside of Chile, and inside of Chile [I think it should look and function the same in both places]. Let's see if we agree on this. Then I'll conclude with what I see as our goals for the upcoming negotiations with the Chileans.

As a separate note I incorporate all these same ideas in a draft revision to Ian's note.

2. Should the Main ALMA Offices be Located in Chile? The Functional Structure of ALMA Outside of Chile.

Bob highlights his experience, direct and indirect, that programmatically it is difficult to operate an observatory in a remote location owing largely to the difficulty of finding top-notch people who are willing to live in remote places. He concludes that the Director of ALMA and the ALMA Observatory Office should be located in one of the northern hemisphere partner areas (where recruitment and retention of high quality staff is easier). Clearly this is a major concern.

Let's look at who these "top notch" people are that we'll have trouble relocating to Chile. They are:

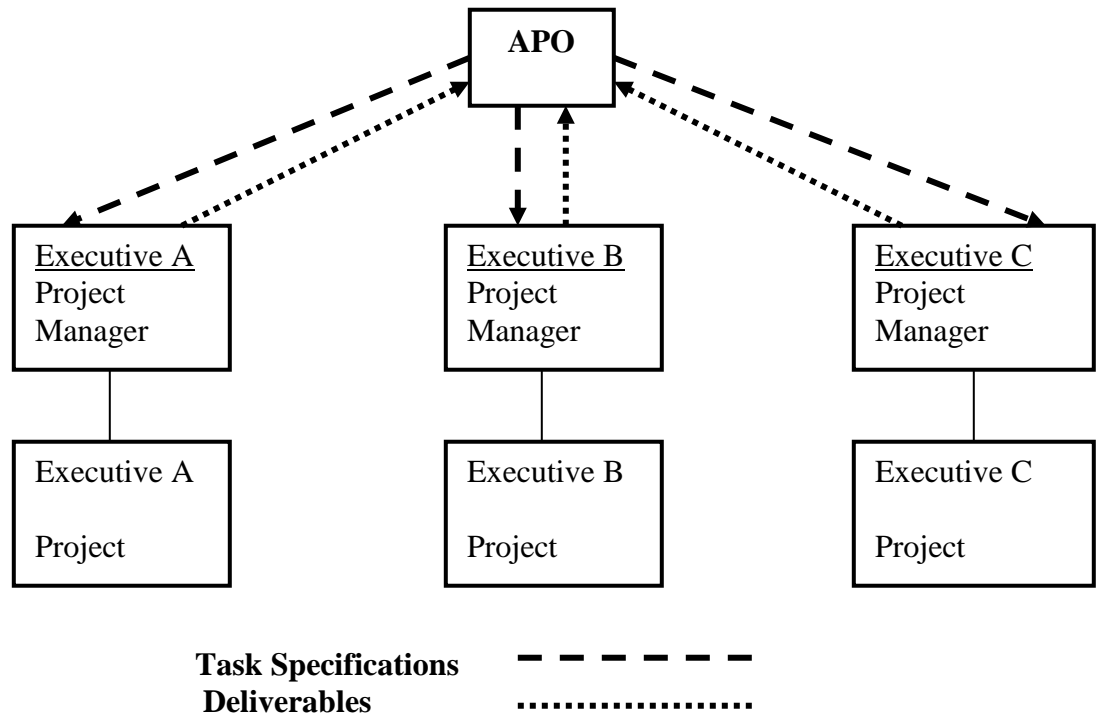
- Scientists. A significant number of dedicated support scientists will be needed to (a) review each proposal; (b) choose calibration sources tailored to the scientific goals; (c) establish the calibration strategy; (d) prepare the observing script and submit it to the schedule file; (e) review the as-taken data and verify the data quality; (f) see that the data are entered into the archive.

- Engineers. The highest level, design engineers, will be working either to develop new instrumentation to bring new science capabilities to ALMA or to improve existing designs for higher reliability, performance or maintainability.
- Software designers. The highest level data management personnel will work to provide either new algorithms to bring new science capabilities to ALMA or they will work to improve existing data management designs for greater reliability, performance or maintainability.

In total, this is likely to be a significant number of people engaged in ALMA tasks of high visibility and, in many cases, high intellectual content.

Let's allow for the moment that these people are located outside of Chile. Where? They could be either at the "ALMA Observatory Office" as Bob suggests, or they could be at the Executives' facilities. From Day One of the joint ALMA Project both the NRAO and ESO have emphasized that *they* want these continuing development and operational tasks at their observatories. This integrates ALMA into the observatory structure making it a firm part of NRAO and ESO respectively. The alternative, to establish such functionality at the ALMA Observatory Office can also work, this is exactly the Gemini model. But I don't believe that we want to propose to such a thing to the Europeans. I won't discuss this further. However, we are then left with the question of how we manage this functionality, this needed functionality, if it is located at the Executives' facilities.

Here's how I see these ALMA outside-of-Chile functions being organized and managed. The ALMA Project Office (APO), with the concurrence of the ALMA Board, sets specifications for such high-level development and operations tasks. That is, the APO decides whether a receiver design should be improved or a new imaging algorithm written; and the APO sets the spec for that task including scope, schedule, cost and deliverable. One or another of the Executives then carries out the task via competition or negotiation as agreed. The same process applies to the high level operations tasks done outside of Chile. The APO has control of the task specifications (the "input") and the APO has control of the criteria by which the "deliverable" (the "output") is accepted. But the Executives have control of the process by which the input specs get turned into the deliverable. In particular, the Executives control all the resources for the task—people and funds. The Executives' Project Managers are responsible to the APO for the work. Schematically, the organization looks like this:



The important point to emphasize here is this: The organization and management of *high level* development and operational tasks outside of Chile is proposed to be identical to the organization and management of ALMA construction tasks. One model is sufficient for both. And that model respects the guiding principles of the ALMA Project, viz. equality and parity. We believe that the same model will apply equally well to the organization and management of ALMA in Chile.

3. Organization and Management of the Observatory Operation in Chile

There are three distinctly different types of operational tasks to be done in Chile. The first includes execution of the science program, including the antenna configuration, and maintenance of the instrumentation. Examples include:

- Antenna maintenance and re-configuration;
- Receiver maintenance and repair;
- Signal transmission system maintenance and repair;
- Data flow management hardware and software support;
- Execution of the observing scripts.

All of these tasks require coordination, instruction and oversight from the Executives in their respective home regions. This is because the *high level* hardware and software development and support, and the operational planning is done by the Executives outside of Chile.

The second type of operational tasks includes those tasks that are planned to be done as *contract services*. The only ALMA personnel involved in these tasks are the personnel needed to provide oversight for the work being done by contractors. Examples of these tasks include:

- Road maintenance
- Transportation services
- Residence facility operation
- Security
- Site services (water, power, sewer)

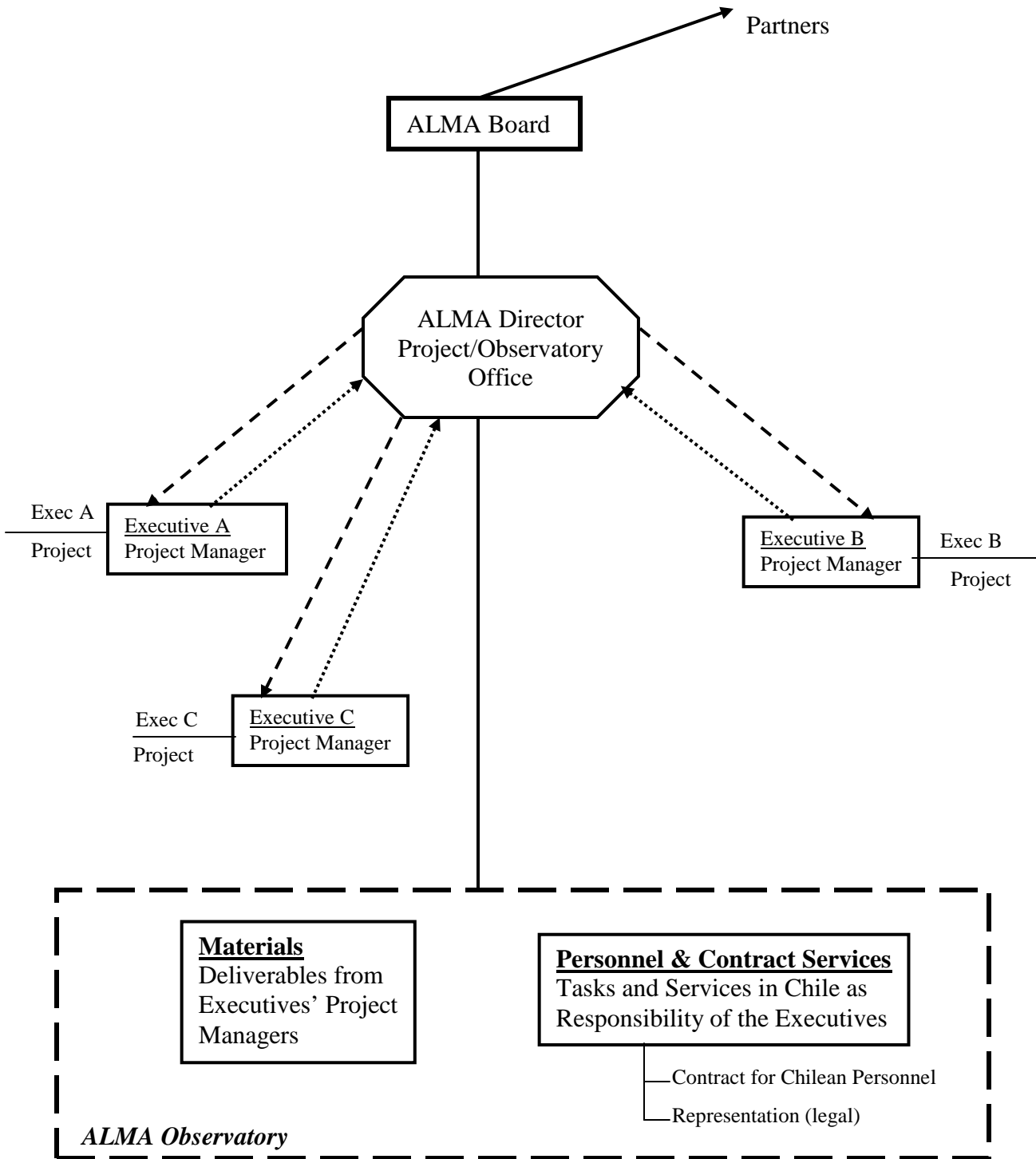
Finally, the third type of operational tasks relate to administrative functions. They include:

- Business office
- Human resources support services
- Audits
- Day to day dealings with Chilean officials

The first type of tasks should be the responsibility of the Executives because it is the Executives that provide the high level functionality for these tasks outside of Chile. The latter two types of tasks, but these only, are best handled directly by the APO (or its operational successor, the ALMA Director/Observatory Office).

The overall structure is illustrated on the following page.

ALMA Functional Organization



Task Specifications - - - - -

Deliverables

As is apparent in this diagram, the ALMA Observatory consists of materials provided by the Executives and tasks performed by the Executives. All of this work and effort is managed by the Project/Observatory Director in one of two ways depending on whether the task involves what is called “Materials” in the figure above, or whether the task involves what is called “Personnel and Contract Services”. Let’s look at both of these.

Materials. Materials are the deliverables that result from the “high level” tasks contracted for by the Project Director from the Executives. In the construction phase they include all the observatory equipment built by the Executives and imported to Chile; in the operations phase they include the new instrument designs, new software systems, and all the high-level science operations support. The Project Director sets specifications and acceptance standards; the Executives provide the deliverables in the manner they choose. This is a contract arrangement between the Project Director and the Project Managers of the Executives. The employees of the Executives doing the work report to their Project Manager, not to the Observatory Director.

Personnel and Contract Services. Execution of these tasks is the responsibility of the Observatory Director. He or she accomplishes them using resources—personnel and equipment—provided by the Executives. The personnel work directly for the Observatory Director. They are paid by their Executives at a rate established by the Observatory Director. For tasks assigned to the Executives that require contract services, the Executives are responsible for executing those contracts with the approval of the Observatory Director. Two specific tasks are highlighted here that have received much attention: Contracting for Chilean personnel and the legal representation of ALMA.

What is the role of an ALMA Corporation for Chilean Affairs? The Executives may find it advantageous to contract with a corporation to provide the Chilean labor force. Such a corporation may be formed for this purpose by the Executives. The purpose would be to assure that all Chilean staff are hired, paid and reviewed under identical conditions.

What is the legal representation of ALMA in Chile? The legal representation of ALMA in Chile is one of the tasks to be assigned, as agreed by the ALMA Board, to one of the Executives. In this sense it is no different than any of the other tasks that are the responsibility of the Executives under management by the Observatory Director.

4. Goals for the Negotiation with Chile

In order to implement the model set forth above for the organization of ALMA in Chile we will need to secure from the Chileans the following:

- Acknowledgement that ALMA in a partnership of three equal partners;
- Permission for the Executive agencies of those partners to participate in ALMA in Chile under the terms of their respective legal regimes;
- Recognition that the Executives of the ALMA partnership will each
 - Import materials for ALMA
 - Accredit staff to ALMA tasks in Chile

- Contract for services in Chile
- Own ALMA materials
- Assure that each of the Executives could be accredited to provide legal representation in Chile for the ALMA partnership by means of a power of attorney from the other Executives; assure also that it is understood that the ALMA partnership may wish to change the Executive providing such representation and that there is a straightforward way for that to happen.
- Agree that the legal instrument to be used by the Republic of Chile to make the land available to ALMA is to be signed by all three Executives, and of course by Chile.