Tentative Proposal for an AIPS++ Project Book

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We propose that the AIPS++ development group write and maintain a project "book" that describes the current state of the AIPS++ project, with the two of us as initial co-editors. The project book should be written in TEXINFO format so it can be read both on-line by X-windows terminals and in "printed" or "previewable" postscript files. The primary purpose is to have an accurate description of the state of the project for AIPS++ developers, but a secondary purpose would be to provide documentation for others who wish to learn about the state of the project. The VLBA project book is an example of a successful project book for an instrumental project. While a software project is more difficult to describe because of the primitive state of software "engineering", the software approach of developing AIPS++ in object-oriented C++ code should be matched with a rigorous approach to documenting the system for a mixture of programmers and astronomers involved in, or interest in learning about, the project.

In most cases the project book should NOT describe things that are planned for implementation, to avoid the confusion between hopes and realities. Some exceptions might be descriptions of coordinates and other basic reference material. However in all cases contents must be a description of things as they really are, even in preliminary or prototype form.

The following are some of the possible "sections" of the proposed project book:

- Table of contents

- Introduction and statement of purpose for the AIPS++ project and the project book in particular, with cross-referencing to other documentation including memo series.

- Brief history of AIPS++ development, mainly to indicate evolution of major concepts and design elements

- Glossary of terms used for data, instrumental components, algorithms, etc.

- Glossary of mathematical notation used in mathematical description of algorithms and data

- Descriptions of coding and documentation standards and software maintenance procedures

- Concise summary of software system components in terms of classes and their relationships, using diagrams including class hierarchies and descriptions in notations like Coad-Yourdon

- Descriptions of public interfaces of implemented classes and class libraries

- Descriptions of AIPS++ specific data base structures

- Mathematical description of algorithms implemented in AIPS++, including coordinate systems, coordinate transformations, measurement equations for telescopes, and equations (plus logic where necessary) for calibration, correction, imaging, deconvolution, etc.

- A description of the system management tools necessary to maintain versions of the system, recompile the code, and update the code at remote sites from a master repository.

- A series of appendices that contain, in as uniform language as possible, technical descriptions of the aspects of AIPS++ consortium instruments that are important for software development and maintenance, emphasizing things that affect the data and instrument-specific data processing.

- Index of key words