ID	Require.	PGS	Task Name	Duration
50			General defect resolutions/enhancements/docs	1097 days
78	1.1-4	1-U	Performance improvements for imager	44 days

Notes

Target Status: Complete
Target Information: http://shiraz.drao.nrc.ca:8080/AlmaDRPBenchmarks
Requirement Status: 1.1-4::Incomplete
Requirement Info: The performance of the package shall be quantifiable and commensurate with the data processing requirements of ALMA output and the scientific needs of the users at a given time. The timing and reproducibility of results for a fiducial set o reduction tasks on specified test data will be benchmarked and compared against other packages and a list of benchmark specifications provided and maintained by the Project.

Implement efficiency improvements in imager as demonstrated in Benchmarking document.
This entails:
- o implement efficiency improvements in FFT-based convolutions (LatticeFFT, LatticeConvolver)
- o implementation of FFTW library within AIPS++

Imaging comparison should improve from factors of ~3-5 for large images (>= 4000x4000 pixels) to less than a factor of 2.
Full definition of the benchmark requirements/test for ALMA will come from the project.

79	1.1-4	1-U	Performance improvements for calibrater	44 days

Notes

Target Status: Complete
Target Information: http://shiraz.drao.nrc.ca:8080/AlmaDRPBenchmarks
Requirement Status: 1.1-4::Incomplete
Requirement Info: The performance of the package shall be quantifiable and commensurate with the data processing requirements of ALMA output and the scientific needs of the users at a given time. The timing and reproducibility of results for a fiducial set o reduction tasks on specified test data will be benchmarked and compared against other packages and a list of benchmark specifications provided and maintained by the Project.

Implement efficiency improvements in calibrater as demonstrated in Benchmarking document.
This entails:
- o filler population of calibration scratch columns
- o optimization of slot-hunting
- o optimize number of iterations through (use previous solution as guess)

Calibrater comparison should improve from factors of many to less than a factor of 2 over a range of data sets.
Full definition of the benchmark requirements/test for ALMA will come from the project.

106	1.1-4	1-U	Investigation of I/O performance	43 days

Notes

Target Status: Complete
Target Information: http://shiraz.drao.nrc.ca:8080/AlmaDRPBenchmarks
Requirement Status: 1.1-4::Incomplete
Requirement Info: The performance of the package shall be quantifiable and commensurate with the data processing requirements of ALMA output and the scientific needs of the users at a given time. The timing and reproducibility of results for a fiducial set o reduction tasks on specified test data will be benchmarked and compared against other packages and a list of benchmark specifications provided and maintained by the Project

Complete comparison between raw UNIX I/O and the Table system within AIPS++.
Based on results, document use of I/O for application programmers.

ID	Require.	PGS	Task Name	Duration
107	1.1-4	1-U	I/O system document for high level programmers	43 days

Notes
Target Status: Complete
Target Information: http://shiraz.drao.nrc.ca:8080/AlmaDRPBenchmarks
Requirement Status: 1.1-4::Incomplete
Requirement Info: The performance of the package shall be quantifiable and commensurate with the data processing requirements of ALMA output and the scientific needs of the users at a given time. The timing and reproducibility of results for a fiducial set o reduction tasks on specified test data will be benchmarked and compared against other packages and a list of benchmark specifications provided and maintained by the Project

108	1.1-4	1-U	I/O performance improvement implementation	43 days

Notes
Target Status: Complete
Target Information: http://shiraz.drao.nrc.ca:8080/AlmaDRPBenchmarks
Requirement Status: 1.1-4::Incomplete
Requirement Info: The performance of the package shall be quantifiable and commensurate with the data processing requirements of ALMA output and the scientific needs of the users at a given time. The timing and reproducibility of results for a fiducial set o reduction tasks on specified test data will be benchmarked and compared against other packages and a list of benchmark specifications provided and maintained by the Project

117	4.1-5	1-I-high	calibration interpolation	43 days

Notes
Target Status: Complete/SS3
Target Info: calibrater.smooth
Requirement Status: 4.1-5::Incomplete
Requirement Info: Calibration shall involve flexible averaging of data and calibration quantities with user-controllable interpolation, filtering, weighting, and application scope. The interpolation types in the AIPS task CLCAL (boxcar, 2pt, polynomial, median window filtering) should at the minimum be available. There is no simple way to edit the solutions before applying.

135	4.3-4	1-I-high	calibration improvements: transfer	34 days

Notes
Target Status: Postponed
Target Info: Postponed due to Testing
Requirement Status: 4.3-4::Incomplete
Requirement Info: Enable transfer of calibration quantities between sources and/or frequency bands; interpolation, extrapolation and smoothing should be available as necessary.

155	4.3-4	1-I-high	calibration improvements: transfer	41 days

Notes
Target Status: Incomplete
Target Info: Enable simple transfer of calibration quantities.
Requirement Status: 4.3-4::Incomplete
Requirement Info: Enable transfer of calibration quantities between sources and/or frequency bands; interpolation, extrapolation and smoothing should be available as necessary.

ID	Require.	PGS	Task Name	Duration
165	1.2-2	Rob	ALMA TST1 Support	41 days

Notes

Target Status: Complete/SS5

Target Info: Support ALMA testers

Requirement Status: 1.1-2::Incomplete

Requirement Info: All standard observing modes supported by ALMA must be processable by the package.

1. TST1, jan04 - SINGLE FIELD

Single-field, no single dish

Bandwidth = 256 channels or less, Integration time 10 seconds or less, 5-27 antennas Line and continuum imaging Line requires continuum subtraction. Self-calibration should be possible for bright sources.

Possible science:

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1 mm: PdBI 13CO(2-1) + thermal continuum

3 mm: PdBI C18O(1-0) + thermal continuum

3 mm: PdBI multiple lines in same sideband + thermal cont.

7 mm: VLA C2S(4,3-3,2) + thermal continuum

1.3cm: VLA NH3(1,1) + thermal continuum

1.3cm: VLA H2O masers + continuum

Testing Focus:

Functionality: editing (manual editing using msplot), data reduction, deconvolution

Lower Priority (not available or problems may not be fixed): ----------

Automatic editing using heuristics to identify bad data User interface (GUI and glish command line scripting - if it works, that is adequate at this point.) Pointing, Tsys, Weather info to identify bad data (may be available for PdBI data but not for OVRO, BIMA, or VLA data). Polarization for PdBI data (only VLA can do polarization). Editing based on plot of calibrator solutions displayed with calibrator and source uv data. Automatic identification of spectral lines (for uv continuum subtraction). Analysis functions not already included in the package. Generation of publication-quality figure.

ID	Require.	PGS	Task Name	Duration
169	1.1-4		Profile mosaic performance, imager/qimager; document	41 days

Notes

Target Status: Complete
Target Info: Using the ATCA 112 pointing LMC HI mosaic, profile imager and qimager for aid in determining consolidation of functionality and improved performance.
Requirement Status: 5.1-3.6::Complete/1.1-4::Incomplete
Requirement Info: mosaic imaging/performance

197	1.1-4	1-U	Mosaic performance analysis	44 days

Notes

Target Status: Complete/SS6
Target Info: Assess performance of imager/qimager for mosaic
Requirement Status: 1.1-4::Incomplete
Requirement Info: Performance

Recommendation is to merge qimager into the main imager tool

217	1.1-4	1-U	Mosaic performance enhancements	40 days

Notes

Target Status: Complete/SS6
Target Info: Merge qimager, imager, add w-projection. Demonstrate improvements in comparison with performance on ATCA HI dataset (Benchmark 4).
Requirement Status: 1.1-4::Incomplete
Requirement Info: Performance

219	1.2-2	Rob	VLA Summer School Support	40 days

Notes

Target Status: Incomplete
Target Info: 1) Test script and cookbook for U Cam dataset (May 24- May 30)
2) Lead students through data reduction tutorial on June 21st
Requirement Status: NA

220	1.2-2	Rob	ALMA TST2 Preparation	10.75 days

Notes

Target Status: Incomplete
Target Info: 1) Use/comment on cookbook, 2) Reduce NGC 1333 data and provide reduction script for that dataset. Data is located at:
/home/ballista2/jmcmulli/ALMATST2/Data
Requirement Status: 1.1-2
Requirement Info: All standard observing modes supported by ALMA must be processable by the Package.

TST2, jul04 - SMALL MULTI-FIELD

Single-field, no single dish (defined in TST1)

*** PLUS: Small multi-field mosaic imaging, no single dish

Bandwidth = 256 channels or less, Integration time less than 10 seconds

5-27 antennas

ID	Require.	PGS	Task Name	Duration

"ALMA TST2 Preparation" continued

Notes

Line and continuum imaging

Line requires continuum subtraction.

Self-calibration should be possible for bright sources.

Testing Focus: ----------

Functionality: editing (including automatic editing using heuristics to identify bad data), data reduction, deconvolution, mosaic-specific functions in reduction and imaging.

Lower Priority (not available or problems may not be fixed):

User interface (GUI and glish command line scripting - if it works, that is adequate at this point.) Pointing, Tsys, Weather info to identify bad data (may be available for PdBI data but not for OVRO, BIMA, or VLA data). Polarization for PdBI data (only VLA can do polarization). Editing based on plot of calibrator solutions displayed with calibrator and source uv data. Automatic identification of spectral lines (for uv continuum subtraction). Analysis functions not already included in the package. Generation of publication-quality figures.

233	5.3-2	1-I-high	Imaging/mosaicing: polarized primary beam correction	41 days

Notes

Target Status: Incomplete
Target Info: Imaging polarized primary beam
Requirement Status: 1::incomplete
Requirement Info: Careful polarized primary beam correction and pointing correction is needed for high fidelity mosaic imaging.
The primary beam correction must take into account the OTF scanning - not defined.
ALMA standard beam images should be available and distributed to the package - not defined.
Tim's EVLA memo.
The primary beam correction must also take into account the effect of OTF scanning.

249	1.2-2	*	ALMA TST2 Support	41 days

Notes

Target Status: Incomplete
Target Info: Support Tests
Requirement Status: 1.1-2
Requirement Info: All standard observing modes supported by ALMA must be processable by the Package.

TST2, jul04 - SMALL MULTI-FIELD

Single-field, no single dish (defined in TST1)

*** PLUS: Small multi-field mosaic imaging, no single dish

ID	Require.	PGS	Task Name	Duration

"ALMA TST2 Support" continued

Notes

Bandwidth = 256 channels or less, Integration time less than 10 seconds

5-27 antennas

Line and continuum imaging

Line requires continuum subtraction.

Self-calibration should be possible for bright sources.

Testing Focus: ----------

Functionality: editing (including automatic editing using heuristics to identify bad data), data reduction, deconvolution, mosaic-specific functions in reduction and imaging.

Lower Priority (not available or problems may not be fixed):

User interface (GUI and glish command line scripting - if it works, that is adequate at this point.) Pointing, Tsys, Weather info to identify bad data (may be available for PdBI data but not for OVRO, BIMA, or VLA data). Polarization for PdBI data (only VLA can do polarization). Editing based on plot of calibrator solutions displayed with calibrator and source uv data. Automatic identification of spectral lines (for uv continuum subtraction). Analysis functions not already included in the package. Generation of publication-quality figures.

269		1.1-4	1-U	Use FFTW libraries	43 days
270		1.1-4	1-U	Profile single dish/interferometric combination	43 days
280		4.2-4	1-I-high	Atmospheric modelling	43 days

Notes

Target Status: Incomplete
Target Info: Use ATM libraries to implement most of this.
Requirement Status: 4.2-1-4::Incomplete
Requirement Info:
Atmospheric modelling shall be available.
The package should predict the absorption, emission and path length on the line of sight using the model.
Atmospheric modeling will be used to derive the antenna temperatures corrected for atmospheric absorption (to correct for elevation)
Atmospheric modeling will provide conversions between WVR data and the water contribution to astronomical phase in the band. Necessary for dealing with VLA WVR data also.

287		1.1-4	1-U	Single dish/interferometric combination improvements	43 days
291		1.1-2	*	Preparation for ALMA TST3	43 days

Notes

Target Status: Incomplete

Target Info: ALMA TST3

ID	Require.	PGS	Task Name	Duration

"Preparation for ALMA TST3" continued

Notes

Requirement Status: NA

TST3, jan05 - SINGLE & SMALL MULTI-FIELD+SINGLE DISH COMBO

Single-field, no single dish (defined in TST1), Small multi-field mosaic imaging, no single dish (defined in TST2) *** PLUS: Single-field or small mosaic, WITH (and without) single dish (add single dish image information during deconvolution).

Bandwidth = 256 channels or less, Integration time less than 10 seconds

5-27 antennas

Line and continuum imaging

Line requires continuum subtraction.

Self-calibration should be possible for bright sources

Possible science: ----------

1 mm: IRAM30m+PdBI/OVRO/BIMA 13CO(2-1) + thermal continuum 3 mm: IRAM30m+PdBI/OVRO/BIMA HCO+(1-0) + thermal continuum 7 mm: IRAM30m/GBT(OTF)+VLA SiO(1-0) + thermal continuum 1.3cm: IRAM30m/GBT(multifld)+VLA NH3(1,1) + thermal continuum

Testing Focus: ----------

Functionality: editing (including automatic editing using heuristics to identify bad data), data reduction, deconvolution Spot check user interface developments, if available Spectral line and continuum Analysis functions SD+interferometer uv-combination and imaging.

Lower Priority (not available or problems may not be fixed): ----------

Pointing, Tsys, Weather info to identify bad data (may be available for PdBI data but not for OVRO, BIMA, or VLA data). Polarization for PdBI data (only VLA can do polarization). Editing based on plot of calibrator solutions displayed with calibrator and source uv data. Automatic identification of spectral lines (for uv continuum subtraction). Generation of publication-quality figures.

Focus on combination of SD/interferometric data

ID	Require.	PGS	Task Name	Duration
294	4.2-4	1-I-high	Atmospheric modelling	42 days

Notes

Target Status: Incomplete
Target Info: Use ATM libraries to implement most of this.
Requirement Status: 4.2-1-4::Incomplete
Requirement Info:
Atmospheric modelling shall be available.
The package should predict the absorption, emission and path length on the line of sight using the model.
Atmospheric modeling will be used to derive the antenna temperatures corrected for atmospheric absorption (to correct for elevation)
Atmospheric modeling will provide conversions between WVR data and the water contribution to astronomical phase in the band. Necessary for dealing with VLA WVR data also.

ID	Require.	PGS	Task Name	Duration
306	1.1-2	1-U	ALMA TST3 support	42 days
312	6.3-2	1-I-med	Basic Cube Rotation	42 days
	Notes			
	Basic cube rotation and transposition operations, including rotation not orthogonal to cube faces.			
327	1.1-2	*	ALMA TST4 Preparation	42 days
330	6.3-2	1-I-med	Basic Cube Rotation	43 days
	Notes			
	Basic cube rotation and transposition operations, including rotation not orthogonal to cube faces.			
339	1.1-2	*	Preparation for ALMA TST4	43 days
	Notes			
	Target Status: Incomplete Target Info: Support Tests Requirement Status: 1.1-2 Requirement Info: All standard observing modes supported by ALMA must be processable by the Package.			
	TST4, aug05 -			
349	6.3-9.11.x	1-I-med	Fitting of models, shapes and profiles over a region	43 days
	Notes			
	Need exponentials - not in image tool - should add to image.fitsky Need Fourier modes - same as above Need uniform (multi-d) spheres. Need trigonometric functions. Need Lorentz profiles.			
	These may be done through functionals and fitting.			
356	1.1-2	*	ALMA TST4 Support	43 days
	Notes			
	Target Status: Incomplete Target Info: Support Tests Requirement Status: 1.1-2 Requirement Info: All standard observing modes supported by ALMA must be processable by the Package.			
	TST4, aug05 -			
364			SD Package	43 days
371	1.1-4	1-U	Profile SD operations	43 days
380	1.1-2	*	SD Package	43 days
382	1.1-4	1-U	SD operation improvements (imaging, calibration)	43 days
384	1.1-2	*	Preparation for ALMA TST5	43 days
	Notes			
	Target Status: Incomplete Target Info: Support Tests			

ID	Require.	PGS	Task Name	Duration
"Preparation for ALMA TST5" continued				
	Notes			
	Requirement Status: 1.1-2 Requirement Info: All standard observing modes supported by ALMA must be processable by the Package.			
	TST5, feb06 -			
395	6.2-6	2-I-low	Flexible setting of fit constraints	43 days
	Notes			
	Setting of fit constraints (e.g. spacing for multiple lines) will be available and flexible.			
398	1.1-2	*	ALMA TST5 Support	43 days
	Notes			
	Target Status: Incomplete Target Info: Support Tests Requirement Status: 1.1-2 Requirement Info: All standard observing modes supported by ALMA must be processable by the Package.			
	TST5, feb06 -			
407	6.2-6	2-I-low	Flexible setting of fit constraints	43 days
	Notes			
	Setting of fit constraints (e.g. spacing for multiple lines) will be available and flexible.			
420	6.2-3.2	2-I-low	Line fitting: damping profiles	43 days
	Notes			
	Line fitting parameters and profiles should include: damping profiles (lorentzian). imageprofilesupport should have line shapes other than gaussian including Zeeman, Voigt			
424	1.1-2	*	Preparation for ALMA TST6	43 days
	Notes			
	Target Status: Incomplete Target Info: Support Tests Requirement Status: 1.1-2 Requirement Info: All standard observing modes supported by ALMA must be processable by the Package.			
	TST6, aug06 -			

ID	Require.	PGS	Task Name	Duration
432	5.2-7	2-M-low	Imager: choice of FFT/DFT	43 days

Notes
The user will have the choice of FFT and DFT imaging (especially for small data sets).

436	1.1-2	*	ALMA TST6 Support	43 days

Notes
Target Status: Incomplete
Target Info: Support Tests
Requirement Status: 1.1-2
Requirement Info: All standard observing modes supported by ALMA must be processable by the Package.

446	4.3-10	3-N-low	Calibration: supplemental calibration for on-line system	43 days

Notes
Interferometric pointing, focus, baseline, and beam response fitting needed. Can do through scripting, must package at a higher level.

455	5.1-3.10	2-I-med	Multi-frequency synthesis imaging	43 days

Notes
Target Status: Incomplete
Target Info: Multi-frequency synthesis with different spectral models.
Requirement Status: 2::Incomplete
Requirement Info: Dealing with pointing, polarization, instrumental changes, and source spectrum - research topic.

Use ATCA Sault algorithm?

Start	Completed	Finish	Resource Names
Sun 6/1/03		Fri 8/10/07	GM[17%],SB[17%],KG[17%],DK[
Mon 6/2/03	8/19/03	Thu 7/31/03	SB[40%]
Mon 6/2/03	8/19/03	Thu 7/31/03	SB[17%]
Mon 8/4/03	10/21/03	Wed 10/1/03	SB[30%]

Start	Completed	Finish	Resource Names
Mon 8/4/03	10/21/03	Wed 10/1/03	SB[10%]
Mon 8/4/03	10/21/03	Wed 10/1/03	SB[17%]
Mon 10/6/03	1/15/04	Wed 12/3/03	SB[28%]
Tue 12/2/03	P:5/19/04	Fri 1/16/04	SB[38%]
Mon 1/19/04	5/19/04	Fri 3/12/04	SB[12%]

Start	Completed	Finish	Resource Names
Mon 1/19/04	2/18/04	Fri 3/12/04	KG[15%],GM[15%],JM[15%],SB[:

Start	Completed	Finish	Resource Names
Mon 1/19/04	3/22/04	Fri 3/12/04	SB[75%]
Mon 3/15/04	3/25/04	Thu 5/13/04	SB[57%]
Mon 5/17/04		Fri 7/9/04	SB[23%],KG[13%]
Mon 5/17/04		Fri 7/9/04	GM[17%],KG[17%],JM[17%],SB[:
Fri 6/25/04		Fri 7/9/04	RR[25%],GM[17%],KG[17%],SB[

Start	Completed	Finish	Resource Names
Fri 7/16/04		Fri 9/10/04	KG[13%],SB[45%]
Fri 7/16/04		Fri 9/10/04	GM[12%],KG[12%],SB[12%],JM[:

Start	Completed	Finish	Resource Names
Wed 9/15/04		Fri 11/12/04	SB[25%]
Wed 9/15/04		Fri 11/12/04	SB[25%],TC[10%]
Tue 11/16/04		Thu 1/13/05	KG[44%],SB[44%]
Tue 11/16/04		Thu 1/13/05	SB[25%],TC[10%]
Tue 11/16/04		Thu 1/13/05	JM[13%],SB[13%],GM[13%],KG[

Start	Completed	Finish	Resource Names
Mon 1/17/05		Tue 3/15/05	KG[44%],SB[44%]

Start	Completed	Finish	Resource Names
Mon 1/17/05		Tue 3/15/05	JM[12%],SB[12%],GM[12%],KG[:
Wed 3/16/05		Thu 5/12/05	SB[44%]
Wed 3/16/05		Thu 5/12/05	GM[12%],KG[12%],SB[12%],JM[:
Mon 5/16/05		Wed 7/13/05	SB[44%]
Mon 5/16/05		Wed 7/13/05	JM[13%],SB[13%],GM[13%],KG[:
Fri 7/16/04		Tue 9/14/04	SB[44%],KG[22%]
Fri 7/16/04		Tue 9/14/04	GM[12%],KG[12%],SB[12%],JM[:
Fri 9/16/05		Tue 11/15/05	GM[17%],KG[24%],SB[24%],DK[:
Fri 9/16/05		Tue 11/15/05	SB[25%],KG[25%]
Wed 11/16/05		Fri 1/13/06	GM[24%],KG[24%],SB[24%],DK[:
Wed 11/16/05		Fri 1/13/06	GM[20%],KG[20%],SB[20%],DK[:
Wed 11/16/05		Fri 1/13/06	JM[13%],SB[13%],GM[13%],KG[:

Start	Completed	Finish	Resource Names
Mon 1/16/06		Wed 3/15/06	SB[44%]
Mon 1/16/06		Wed 3/15/06	GM[12%],KG[12%],SB[12%],JM[:
Thu 3/16/06		Mon 5/15/06	SB[57%]
Tue 5/16/06		Thu 7/13/06	SB[57%]
Tue 5/16/06		Thu 7/13/06	JM[13%],SB[13%],GM[13%],KG[:

Start	Completed	Finish	Resource Names
Mon 7/17/06		Wed 9/13/06	SB[44%]
Mon 7/17/06		Wed 9/13/06	GM[12%],KG[12%],SB[12%],JM[:
Wed 8/16/06		Fri 10/13/06	SB[57%]
Mon 10/16/06		Wed 12/13/06	SB[50%]