



PRECISION RADIAL VELOCITY SPECTROMETER

Document Title	PRVS Pricing Information
Document Number	PRVS-BDG-00002-0001
Issue	1.0
Date	20 TH September 2006

Document Prepared By:	David Lunney	Signature and Date	David Lunney 20 TH September 2006
Document Approved By:	Ian Bryson	Signature and Date	Ian Bryson 20 TH September 2006
Document Released By:	Ian Robson	Signature and Date	Ian Robson

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

CHANGE RECORD

Issue	Date	Section affected	Change Description
0.1	11 September 2006		First draft
1.0	20 September 2006		First Issue

ACRONYMS & ABBREVIATIONS

APPLICABLE DOCUMENTS

Reference	Document Title	Document Number	Issue/Date
AD01	Statement of Work	Workscope 0084699- GEM01056, Exhibit A	06 Jan 2006
AD02	PRVS Management Plan	PRVS-PLA-00003-0001	1.0
AD03	Draft Phase 2 Construction Contract	0525280_GEM00__	v02 6 Aug 2006

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

TABLE OF CONTENTS

1. SCOPE	4
2. SUMMARY	5
3. PRICING POLICY	5
4. FORMULATING THE ESTIMATE	6
4.1 TOP-DOWN ESTIMATE.....	6
4.2 BOTTOM UP ESTIMATE.....	6
4.3 UK ATC PRICING	7
4.3.1 Effort.....	7
4.3.2 Requisitions	7
4.4 IFA PRICING.....	7
4.4.1 Effort.....	7
4.4.2 Requisitions	7
4.5 PSU PRICING.....	7
4.5.1 Effort.....	7
4.5.2 Requisitions	7
4.6 INFLATION	8
4.7 CURRENCY EXCHANGE RATES	8
5. PRICE SUMMARY	9
6. MILESTONES AND PAYMENT MILESTONES	11
7. AURA ASSUMED RISKS	12
8. CAVEATS ON OFFER.....	12
APPENDIX A – RESPONSE TO DRAFT CONTRACT.....	13

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

1. SCOPE

The Price Analysis of the proposed solution to PRVS is described in this summary document and the associated detailed document. It also makes reference to the Management Plan, which describes the processes and procedures that will be used to manage the work required to take the conceptual design of PRVS and complete the design, fabrication, integration, test and delivery of the Instrument to the Gemini Observatory.

In reference to the Statement of Work (AD01), this document will therefore cover the following sub-paragraphs of section 4.3.4.

Para	Description	Pricing Documents S= Summary, D = Details Doc		Management Plan
a)	Delivery Schedule	Payment Milestones	S	How derived, Level 1 Gantt plus expected key milestones
b)	WBS	Full descriptions	D	How derived, Diagram plus Level 1 WBS descriptions
c)	Resource Requirements	Full description	D	How managed – see l)
d)	Procurement List	All	D	
e)	Budget and payment plan	All	S	Management of Contingency
f)	Options Prices	N/A	S	
g)	Price Qualifications	All	S	
h)	Team Organisation			All
i)	Management Techniques			All
j)	Lab Facilities			All
k)	Key Milestones	Repeated	S	List of Key technical milestones
l)	Resource Allocation			Description of local processes
m)	Quality Control			Description of local processes
n)	Document Management			Sub-document
o)	Key Risks and Mitigations			Sub-document for procedures Full current Risk Register is a separate document

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

2. SUMMARY

The consortium led by the UK ATC have estimated that they can complete the design, build and test of the PRVS Instrument as described in the rest of this report for a *Contract Price* of \$9,541,205. This *Contract Price* follows the guidelines given in the amended version of a Draft PRVS Phase 2 Contract issued by the Gemini Observatory and provided as an Appendix to this document. Based on these Guidelines we expect the Gemini Observatory/AURA to retain a working reserve of at least \$1,431,180 for potential 'AURA Assumed Risks'.

	Effort (DSY)	Requisitions (\$k)	Contract Price (\$)	Aura Reserve (\$)
UK	26.55	1514		
USA	13.32	1145		
TOTAL	39.87	2659	9,541,205	1,431,180

The US/UK workshare split for effort is 34% US, 66% UK.

Please note the following key assumptions in this estimate:-

- The Assumed Dollar – Sterling Exchange Rate is \$1.90 to £.
- Effort estimates were collected in staff weeks. For info in comparing with other bids, 1 dsy = 36.8 weeks
- The Price needs to be ratified by PPARC, the parent body of the UK ATC. We expect to have had this review by the time of the Project Review in Hilo and certainly no later than end of October 2006.

As described elsewhere, the Consortium has focussed the Instrument entirely on the single 'key' science case. Therefore there are no de-scope options or alternatives to the Contract Price detailed above.

3. PRICING POLICY

The Gemini Observatory has declared two assumptions which underpin the way they have been/are approaching the construction phase for the 'Aspen' Instruments. These are:-

- Both Gemini and the Aspen instrument builders are committed to providing these instruments to achieve the research goals of the Gemini science community
- Neither Gemini nor its instrument teams have an endless supply of resources to build these expensive and technically challenging instruments

We, as a Project team, are fully supportive of these two fundamental assumptions and of the spirit of the process proposed to establish realistic costs and a means of catering for contingency. Indeed we welcome the developments in the content of the 'Draft Phase 2 Contracts' which have evolved since the HRNIRS Conceptual Design Studies. In particular, whilst we have requested some specific alterations per the Appendix, we find the clarification on the definition and handling of 'Contingency' to be very helpful in establishing mutual understanding.

The Draft Contract defines the value of the two 'Contingency Elements', the Contractor's 'Internal Contingency' and the AURA retained Reserve for 'AURA Assumed Risks' in a formulaic manner based on a '15%' value. In calculating the *Contract Price* to Gemini we have adhered to this definition though we have actually built the bottom-up costs following the Guidelines in the PPARC Project Handbook. The PPARC Project Handbook defines the price of a Project as three elements:-

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

- The Basic price for the Instrument as described in the detailed analysis
- A '**Working Allowance**' to cover the potential problems and risks that are known to the team at this time and should be enough to deliver at least 3 out of every 4 workpackages within the baseline price plus working allowance
- A '**Contingency**' to account for the unknown problems that may affect the project and should be adequate to increase the odds of success from 3 in 4 to 19 out of 20.

These figures have been collated for each element of the WBS and will be used for an initial allocation of working allowance for each Institute to control separately per the processes to be found in the consortium Memorandum of Understanding.

4. FORMULATING THE ESTIMATE

The UK ATC and PPARC have been investigating pricing methodologies for one-off, state-of-the-art instruments for the past few years in an effort to find a solution to the constant delays to delivery and increased costs. As we showed at the Gemini Lessons Learned Workshop in August 2002, the track-record of delivery to either schedule or cost for 8m-class instruments is abysmal. It is against this reality that we have worked extensively to address our pricing methodologies, risk assessments (including cost and schedule-based risk assessments), along with project management, project tracking and the application of systems engineering. In particular we have a comprehensive time recording system which allows us to analyse past data for appropriate metrics etc. We share the goal of getting the best instruments on Gemini at the fairest price. PPARC is a major shareholder in the Gemini project and we, as part of PPARC, are mandated to ensure that our costs are realistic; they are neither inflated, nor are they underbid.

Following the practices developed recently, we have taken two approaches to the cost estimate, a top-down estimate and a more comprehensive, bottom-up estimate based on the Instrument Product Work Breakdown Structure described in the Management Plan.

4.1 TOP-DOWN ESTIMATE

During the period up to May 2006 we used a top-down estimate to calculate an approximate price for the Gemini Observatory to use in assorted Board meetings etc. Unlike HRNIRS, the Instrument was not changing dramatically in design and so this estimate has remained reasonably valid since then. In May we took account of the actual costs of previous instruments or elements thereof, the number of mechanisms and optical assemblies required, the number of drawings required, the complexity of the design etc as benchmarks against which we produced a fairly crude split of effort by Sub-system and by Discipline. Excluding effects for inflation, this 'by analogy', 'by comparison' 'Contract Price' was about \$8.67M with a proposed additional Contingency of about \$1M. The DSY count in the Contract price was approximately 40. Unfortunately staff rates, particularly in the UK, have increased dramatically since due to Government policies.

4.2 BOTTOM UP ESTIMATE

This is the method we have used to establish the prices for the final proposal and can be used with more fidelity now that we know more about the instrument requirements, the solutions and the potential risks. We also now have an accurate Systems Architecture and Work Breakdown Structure (WBS) as described in the Management Plan and Systems Overview.

Having established the WBS, the project team completed workpackage descriptions for all the necessary workpackages. The data included the aims, inputs, tasks and outputs. The team, taking inputs from the Heads of Engineering specialisms, then produced estimates of the required effort and requisitions to

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

complete each task in addition to obtaining quotes from Suppliers for key elements such as Optics, Detectors etc. The effort and cash requirements were profiled assuming the project schedule described in the Management Plan. The workpackage owners were also asked to identify appropriate working allowance and Project Contingency as per the definitions in this document and the Management Plan. Detailed profiling of effort will be required in due course for Phase D of the project, when we will be promoting the higher risk sub-systems to early starts to de-risk the project.

The WBS data collection was organised so that we could easily get subtotals and assess effort totals by discipline against previous projects of similar complexity or technical requirement. Once the data had been collected and verified, the process of establishing cash costs, inflation etc, was straightforward. All Effort estimates were made in 'Staff weeks' and the effort costs calculated based on a 'weekly rate' to avoid complexities of how each Institute defines an FTE or DSY.

The Detailed Pricing Analysis Document also includes a procurement list identifying the main hardware items for which we have received ROMS or for which we have used data from previous projects.

4.3 UK ATC PRICING

4.3.1 Effort

The cost of effort at the UK ATC has been based on a single rate, the dsy (direct staff year) rate, for all levels of staff. The dsy rate for the Financial Year starting April 2006 has already been agreed and forms the basis of this estimate.

4.3.2 Requisitions

The PRVS project will be exempt from local VAT. Thus no taxes will be charged to purchases made by the UK ATC. All imports will also be exempt from duty since the final product is for export.

4.4 IFA PRICING

4.4.1 Effort

The IfA applies multiple rates depending on whether staff are Faculty or Engineering and, within engineering, based on band. The staff rates are based on the Financial year at the IfA which started in July 2006.

4.4.2 Requisitions

Project hardware will not be subject to overhead levies but travel will incur a 27.5% overhead, which is standard UH policy.

4.5 PSU PRICING

4.5.1 Effort

PSU applies multiple rates depending on whether staff are Faculty or Engineering and, within engineering, based on band. The staff rates are based on the Financial year at the PSU which started in July 2006.

4.5.2 Requisitions

No known constraints.

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

4.6 INFLATION

We have assumed inflation at 3.5%. The rate for the year starting April 2005 has already been agreed and forms the basis of this estimate.

To calculate the inflation component we have assumed an 18 January 2007 start. We have only calculated inflation on the Effort costs at both Institutes.

4.7 CURRENCY EXCHANGE RATES

We have assumed an exchange rate of \$1.9 to the £ as a reasonable average for the lifetime of the project. We believe this to be a shared risk contingency item between PPARC and AURA. However we are willing to work with AURA to minimise the exposure to exchange rate fluctuations where possible by ordering all large value US-originated items, such as the Detectors and Gratings, through the IfA or PSU. This may distort the issues of 'national share' though the effect will be relatively small in the overall Aspen programme. The possibility of the Sterling to Euro exchange rate affecting the project (mainly lenses and mirrors) is significantly less at this time and is adequately covered by the contingencies held by both AURA and the Consortium.

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

5. PRICE SUMMARY

This table shows the summary of the costs by Level 1 workpackage and includes all working allowance and Project Contingency per the PPARC Guidelines. These latter elements are provided for information but, as described earlier, may not directly match the Gemini Observatory definitions of 'Internal Contingency' and 'AURA Reserve'. It does not show the total cash cost of the effort.

Work Package Description							
Project:		PRVS		Issue:		1	
WP Title:		INSTRUMENT		Date:		01 September 2006	
WP Start Event:		PROJECT START		WP Ref No:		0 0 0	
WP End Event:		READY FOR SCIENCE VERIFICATION					
WP Owner:		DAVID LUNNEY		Organisation Responsible:		UK ATC	

Aims of WP:	
1	Gather full Requirements and review design Options
2	Design Instrument meeting requirements and review
3	Build Instrument and verify performance at home Institute
4	Deliver to telescope and Confirm performance on Sky
5	Provide documentation as required

Inputs to WP:	
1	Proposal
2	Science Case
3	
4	
5	
6	

WP Tasks:	Duration (Cal Weeks)	Effort (weeks)			Material			
		Total	ATC	PSU/IFA	Total	£k	\$k	
B0	PRELIMINARY DESIGN	0	310.8	146	164.8	24.65458	0	46.93
C0	DETAILED DESIGN PHASE	0	223.3	124	99.3	485.6765	50.163	829
D0	SUB-ASSEMBLY AIV	0	218.4	115	103.4	625.4879	353.2	518.3
E0	INTEGRATION & VERIFICATION	0	207.8	165	42.8	0	0	0
F0	COMMISSIONING	0	112	92	20	98.9	98.9	0
SE	SYSTEMS ENGINEERING	0	76	76	0	0	0	0
SC	SCIENCE	0	136	94	42	81.52088	50	60
PM	PROJECT MANAGEMENT	0	177.8	160	17.8	82.02088	50.5	60
WP Sub-Totals:			1462.1	972	490.1	1398.261	602.763	1514.23
Working Allowance			145	97	48	148.3327	64.96	158.7
Total inc. Working Allowance			1607.1	1069	538.1	1546.594	667.723	1672.93
Contingency			156	106	50	145.3383	64.96	153
Total inc. allowance & contingency			1763.1	1175	588.1	1691.932	732.683	1825.93

Outputs of WP:	
1	Fully Operational System
2	Acceptance Test reports
3	Final System Budgets
4	Final Versions of Design, User and Maintenance Manuals
5	Special Test, assembly and Handling equipment
6	Spares as agreed (cost will be covered via separate contract)

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

Note that the Working Allowance and Contingency Figures for both effort and Requisitions are for Consortium use only and were only used as a cross check against the AURA definition of 'Internal Contingency'.

DISCIPLINE	UK ATC (DSY)	PSU (DSY)	IFA (DSY)	TOTAL
Optical Engineer	2.88	0.32	0.41	3.61
Mechanical Engineer	2.99	2.34	0.87	6.20
Mechanical Draughtsman	1.22	0.39	0.38	1.99
Workshop / Technician	1.71	0.84	0.16	2.71
Software Engineer	3.64	1.28	3.04	7.96
Electronic Engineer	2.36	0.16	0.22	2.74
Electronic Technician	1.06	0.14	0.05	1.25
Electronic Wiring	1.06	0.11	0.11	1.28
Project Manager	3.37	0.18	0.30	3.85
Project Assistant	1.20	0.00	0.00	1.20
Project Scientist / PI	1.47	0.66	0.00	2.13
Instrument Scientist	1.52	0.00	1.36	2.88
Systems Engineer	2.07	0.00	0.00	2.07
TOTAL	26.55	6.42	6.90	39.87

Figure 1 Effort Summary by discipline in DSY

ITEM DESCRIPTION	Cost (\$K)	% of Material Total
IR ARRAYS	700	26.3
VACUUM VESSEL	115	4.3
RADIATION SHIELD	50	1.9
ECHELLE GRATING	250	9.4
CROSS DISPERSER	140	5.3
WP MIRROR	90	3.4
CAMERA LENSES	130	4.9
TRAVEL	204	7.7
ARRAY CONTROLLERS	67	2.5
COMMISSIONING & SHIIPING	188	7.1
TOTAL	1934	72.7

Figure 2 High Value Procurement Items

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

6. MILESTONES AND PAYMENT MILESTONES

Project Schedule Milestones

Milestone	Month	Comment
PROJECT KICK-OFF MEETING COMPLETE	0	
DETECTORS ARRAYS ORDERED	3	
OPTICAL FDR COMPLETE	3	To allow Long lead optical components to be ordered
PROJECT PDR COMPLETE	9	
CRYOSTAT REVIEW COMPLETE	11	
OPTICAL FDR COMPLETE	12	
PROJECT FDR COMPLETE	15	
START SUB-SYSTEM AIV	19	
START INSTRUMENT AIV	22	
THERMAL PERFORMANCE CONFIRMED	26	
ACCEPTANCE TESTS COMPLETE	30	
INSTRUMENT DELIVERED TO GEMINI	32	
INSTRUMENT READY FOR TEST AT TELESCOPE	32	
INSTRUMENT READY FOR SCIENCE VERIFICATION	34	

These are some initial proposals for Payment Milestones. They should be tied to verifiable milestones with reasonably neutral cash flow for the Collaborators. This can be negotiated with the Contract.

Milestone	Month	Comment
PROJECT KICK-OFF MEETING	0	
OPTICAL FDR COMPLETE	6	
PROJECT PDR COMPLETE	9	
OPTICAL FDR COMPLETE	12	
PROJECT FDR COMPLETE	15	
START INSTRUMENT AIV	22	
THERMAL PERFORMANCE CONFIRMED	26	
ACCEPTANCE TESTS COMPLETE	30	
INSTRUMENT READY FOR SCIENCE VERIFICATION	34	

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

7. AURA ASSUMED RISKS

As is shown in the Risk Register, some 14 of the 48 risks are deemed to be covered by the definition of AURA Assumed Risks. These have a potential total value of some \$1.55M which compares favourably with the calculated 'AURA Reserve' of \$1.43M, bearing in mind that although other 'unknowns' may well occur, the overall probabilities of all occurring are significantly less than 100%.

8. CAVEATS ON OFFER

The only caveats on this offer are the need for PPARC to ratify the bid values through their own independent review. This process will have been completed by the end of October 2006 at the latest. Obviously we will also need to get agreement on the proposed amendments to the draft Contract as issued in the appendix to this document.

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

APPENDIX A – RESPONSE TO DRAFT CONTRACT

The following pages are an edited version of the Draft Phase 2 Contract, v2, dated 6 August 2006 and issued to the Consortium by Andy Flach. These pages, with an appropriate Statement of Work, should form the basis for an overall contract.

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

Contract for the Precision Radial Velocity Spectrometer (PRVS) Instrument AURA Contract No. 0525280-GEM00____

Draft v02 6 Aug 2006
Comments inserted by PPARC (UK ATC) Sep 2006

THIS CONTRACT is entered into as of the date given above between the ASSOCIATION OF UNIVERSITIES FOR RESEARCH IN ASTRONOMY, INC., an Arizona corporation, acting as the operator of the Gemini Observatory ("AURA") and _____, hereinafter referred to as "Contractor."

RECITALS:

WHEREAS, the Gemini Observatory is an international astronomical facility involving agencies of the governments of Argentina, Australia, Brazil, Chile, Canada, the United Kingdom, and the United States of America;

WHEREAS, the National Science Foundation of the United States of America ("NSF") acts as Executive Agency for the Gemini Observatory, and under Cooperative Agreement AST0525280 (and any successor agreement) between AURA and the NSF, AURA is operating the two (2) astronomical observatories and related facilities which make up the Gemini Observatory;

WHEREAS, AURA has funding available for the design and construction of a PRVS Instrument ;

WHEREAS, AURA wishes to enter into a contract with Contractor to provide PRVS Instrument ;

NOW, THEREFORE, in consideration of the Recitals set forth above, the terms, covenants and conditions contained in this Contract, and other good and valuable consideration, AURA and Contractor hereby agree as follows:

1. Contract Documents and Definitions.

1.1. Contract Documents. (a) This Contract is made up of the following documents, which are hereby incorporated in this document by reference:

- (1) Main Document (This document)
- (2) Statement of Work (Exhibit A, attached)
- (3) Terms and Conditions (Exhibit B, attached)

(b) The provisions of the Main Document, the Statement of Work, the Terms and Conditions, shall be construed in a manner consistent with each other, and wherever possible, as additional provisions to those set forth in the other portions of this Contract, rather than as substitute or conflicting provisions. In the event of an irreconcilable conflict between the provisions of any of the documents which make up this Contract, the terms of a document which appears higher on the following list shall control over the terms of a document which is lower:

Main Document
Statement of Work
Terms and Conditions

1.2. Defined Terms. In this Contract, the following capitalized terms shall have the following meanings. Names and contact information for individuals can

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

be changed by written notice given to the other party's administrative representative and do not require a contract amendment:

AURA. This term is defined in the first paragraph of this document.

Conceptual Design Contract. This term refers to the previous contract between AURA and Contractor for the development of the conceptual design for the Instrument, AURA Contract No. 0084699-GEM_____.

Contract Price. The "Contract Price" is the fixed total amount payable by AURA to Contractor in exchange for completion of all of the Work under this Contract, as provided in Section 3, below.

Contractor. This term is defined at the beginning of main document of the contract.

Contractor Administrative Representative. The initial contact person for administrative and legal matters for Contractor shall be:

John Beck
UK Astronomy Technology Centre
Royal Observatory Edinburgh
Blackford Hill
Edinburgh UK
EH9 3HJ
Telephone: +44 131 668 8271
Email: J.Beck@roe.ac.uk

Delivery Location. The term "Delivery Location" refers to the location where Contractor shall deliver the Instrument, as follows:

Gemini Northern Operations Center
Hilo, Hawaii

Gemini Contracts Manager. The initial Gemini Contracts Manager, who is responsible for all administrative matters related to this contract is:

Andrew Flach
AURA-Gemini Observatory
Gemini Observatory
670 A'ohoku Place
Hilo HI 96720
Email: aflach@@gemini.edu
Telephone: 520-749-1560
Fax: 520-203-0237

PRVS. This term refers to an instrument which meets the Requirements.

Instrument. This term refers to the PRVS Instrument .

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

Negligence. The term "Negligence" means omission or neglect of reasonable care, precaution or action."

Comment: This is required due to the wording in Paragraph 7.3.(c) under Contractor Assumed Risks.

Program Manager. The "Program Manager" is the person responsible for the overall success of the Work and for managing the Work for Contractor and being the contact person for all technical and management issues related to this Contract. The initial Program Manager shall be as listed below. The Program Manager cannot be changed without written permission from the Technical Representative. The Deputy Program Manager will assume the duties of the Program Manager at times when the Program Manager is otherwise obligated.

David Lunney
UK Astronomy Technology Centre
Royal Observatory Edinburgh
Blackford Hill
Edinburgh UK
EH9 3HJ

Telephone: +44 131 668 8303
Email: D.Lunney@roe.ac.uk

Proposal. The term "Proposal" refers to the final version of the proposal submitted to AURA by Contractor under the Conceptual Design Contract. The portions of the final version of the Proposal which describe the Instrument requirements and specifications, and the scope of work to be performed, are incorporated in this Contract by reference so that Contractor shall be obligated to perform any tasks, and comply with any requirements, described in such documentation which are not described in this Contract, provided, however, that to the greatest extent possible the provisions of the Proposal shall be construed as being in addition to the requirements of this Contract instead of being interpreted as being inconsistent with the requirements of this Contract. Terms and conditions in the Proposal which are unrelated to the scope of work or the technical requirements, such as provisions regarding price, schedule, the nature of the contract, liability for breach, etc. are not incorporated by reference in this Contract and such terms are provided exclusively by this document and the Terms and Conditions. In the event of an irreconcilable conflict between the Proposal and the provisions and requirements of this Contract, the terms of this Contract shall control.

Comment:

Comment: The Contractor wishes to clarify in negotiations the suitability of the combination of OCDD & FPRD as a 'contractual document'

Requirements. "Requirements" refers to the requirements given in Section ___ of the Statement of Work.

Schedule. This term refers to the schedule given in Section 5, below.

Start Date. The term "Start Date" refers to the date that Contractor receives an original of this Contract which has been signed by both AURA and Contractor.

Technical Representative. The Technical Representative is defined in paragraph ___ of the Statement of Work, below. The initial Technical Representative is:

Name
Telephone:
Email:

Work. The term "Work" is defined in Section ___ of the Statement

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

of Work.

1.3. Additional Definitions. Additional terms are defined in Section 1 of the Statement of Work. Such terms have the same respective meanings in all of the documents comprising this Contract, unless the context requires otherwise or unless otherwise defined therein.

2. Scope of Work. Contractor shall perform the Work as described in the Statement of Work.

3. Contract Price. (a) In exchange for satisfactory completion of all of the Work, AURA shall pay Contractor the fixed price of USD _____ (the “Contract Price”), payable as provided in Section 4, below.

(b) Except as specifically provided below in Section 7, payment of the Contract Price shall be Contractor’s **only** compensation for the expenses it incurs performing the Work. In no event shall AURA be obligated to pay Contractor, or Contractor’s agents or subcontractors, any amounts in addition to the Contract Price.

4. Payments to Contractor. (a) Contractor shall be entitled to invoice AURA for the following portions of the Contract Price upon the completion of each of the following “Milestones”:

Milestone Event	Milestone Payment Amount

(b) Upon the successful completion of a milestone, Contractor shall submit an invoice to AURA containing: (1) the number of this Contract; (2) a statement that the relevant milestone has been completed; and (3) the amount due for that milestone based upon the table given in paragraph (a), above. AURA shall pay such invoices within 30 days after the date the invoice is received or the milestone is actually completed, whichever is later. All payments due Contractor under this Agreement which are received later than when due (as defined above), shall be subject to an additional payment of one and one-half percent (1.5%) per month or portion thereof as liquidated damages for payments received later than when due.

5. Schedule. (a) Contractor shall commence performing the Work promptly upon, but not before, the date that it receives a fully executed original of this Contract (the “Start Date”) and shall complete the following tasks by the dates given below:

Event	Days after Start Date

(b) Contractor shall monitor the progress of the Work on a continuing basis and shall promptly inform the Technical Representative of anything that threatens to

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

delay the Schedule.

6. Rates for Change Orders. The fully loaded rates (i.e. which already include all types of indirect costs) listed below shall be used by Contractor to calculate the price of any change orders or any other agreed upon scope changes (amendments) and are valid for the term of the contract.

Contractor Labor: ____ multiplied by salary

Purchased Materials and Services: ____% over Contractor's direct cost (i.e. cost to AURA is Contractor's direct cost multiplied by 1.____).

Comment: These figures will be provided during final negotiations and will be dependent on Institute, fiscal year etc

7. Contingency and Allocation of Development Risks.

7.1. Internal Contingency. Contractor represents that the Contract Price is equal to Contractor's good faith estimate of how much it will actually cost to perform the Work multiplied by 1.15 (i.e. the Contract Price contains a 15% contingency reserve). Contractor will use this 15% contingency reserve ("Internal Contingency") to cover any and all unexpected costs associated with Contractor Assumed Risks (defined in section 7.3) performing the Work until it is depleted. It will only be used for any costs associated with AURA assumed risks by mutual agreement between the parties (section 7.3)

Comment: This change is required to clarify when the internal contingency is to be used consistent with Section 7.3.

7.2. Gemini Contingency. AURA has budgeted an amount equal to approximately 15% of the Contract Price as a reserve to be used by AURA to provide additional funding for the Instrument as described in Section 7.3, below. Although AURA intends to maintain this reserve if at all possible, funding issues with other Gemini instrumentation programs may require that the amount of this reserve be reduced. The Gemini Contract Manager will promptly inform the Contractor of any changes to the amount of the reserve as this represents a change to the Agreement. If and when an 'AURA Assumed Risk' as described in section 7.3 is reported to AURA, AURA and the Contractor shall agree an interim value which shall be specifically retained by AURA within the Gemini Contingency Reserve until a contract adjustment, if actually required, is formally agreed. As changes in the AURA reserve may bring the successful completion of the Instrument under threat they may result in mutual termination for convenience."

Comment: This change is required since use of the Gemini Contingency and Internal Contingency are mutually exclusive per Section 7.3.(b) & (c)

7.3. Allocation of Development Risks and Use of Gemini Contingency. (a) AURA acknowledges that there are aspects of the Work that require never-before performed research & development and, hence, recognizes that Contractor may encounter physical, engineering, and/or manufacturing limitations that make meeting the Requirements infeasible for the time and money set forth in this Contract. Therefore, AURA will commit to amending the Contract Price or scope of the Work in certain circumstances as described below.

(b) The following events or circumstances are defined as "AURA Assumed Risks":

(1) A physical, engineering, or manufacturing assumption that has been documented (in the Conceptual Design document, for example) or generally understood by the Instrument team, and that a design depends on, turns out to be invalid.

(2) A vendor re-quotes a part higher than an original quote and no lower price alternative can be identified.

(3) A part or component is accidentally damaged without any negligence by Contractor personnel and such loss is not covered by Contractor's property insurance or self-insurance program.

(4) An environmental factor has characteristics other than those documented (e.g., telescope vibration).

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

- (5) A previously undetected environmental factor impacts performance.
- (6) There is inadequate work performed by, or a delay introduced by AURA.
- (7) Economic price fluctuations and currency exchange rate fluctuations.

(c) The following events or circumstances are defined as “Contractor Assumed Risks”:

- (1) Contractor negligently fails to review the design for a component before it is procured and it has to be re-procured.
- (2) Contractor designs or builds an interface that does not comply with published and distributed Interface Control Documentation.
- (3) Contractor negligently inadequately or incorrectly specifies a part, leading to the manufacture of a part that cannot be used.
- (4) Contractor negligently orders the wrong parts or materials and those parts or materials are not returnable.
- (5) Contractor personnel negligently make machining errors.
- (6) A part or component is damaged due to the negligence of Contractor personnel, or damage is covered by Contractor’s property insurance or self-insurance program.
- (7) Contractor was professionally negligent in underestimating the person-power or material cost of a task.
- (8) Contractor negligently fails to start work on a long-lead task on time.
- (9) Contractor fails to apply its resources (labor and facilities) in conformity with the then current project plan approved by the Technical Representative which results in additional costs being incurred because of the resulting delays or inefficiencies.
- (10) Contractor negligently assigns tasks to persons or subcontractors who do not have the necessary skills or experience which results in additional costs being incurred.
- (11) Contractor negligently fails to adequately monitor work performed by employees or subcontractors which results in additional costs being incurred because of the resulting delays or inefficiencies.

(d) Procedure for Adjusting Contract Price, Schedule, or Requirements. (1) Contractor shall utilize its Internal Contingency for those costs associated with Contractor Assumed Risk.

(2) Contractor shall apply to the Gemini Contract Manager for a contract amendment to equitably adjust the Contract Price, Schedule, or Requirements whenever one of the AURA Assumed Risks has occurred. When applying for a contract adjustment, Contractor shall provide the Technical Representative and Gemini Contract Manager with all documentation or information reasonably required to determine whether the conditions below have been met. AURA will immediately retain an appropriate amount of the Gemini PRVS Contingency reserve for this specific risk and will prepare a contract amendment equitably adjusting the Contract Price, Schedule, or Requirements when all of the conditions listed below are met, as reasonably determined by AURA. AURA may choose, acting at its sole discretion, what combination of price, schedule, or requirements adjustments to use to compensate for

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

the AURA Assumed Risk, so long as the net effect is to equitably offset the additional costs stemming from such risk. Any contractual adjustments inconsistent with Contractor's proposal are subject to the disputes clause

A. The event/condition meets the definition of an AURA Assumed Risk.

B. The requested adjustment takes into account any avoidable costs incurred because of negligence by Contractor in identifying and mitigating the consequences of the AURA Assumed Risk.

C. Contractor notified the Technical Representative of the event/condition within 15 days and accepted the Technical Representative's written guidance, if any, on how to mitigate the consequences of the event, and also applied for equitable adjustment within 30 days of receipt of the written guidance or, as appropriate, acceptance of the AURA assumed Risk.

D. When Contractor applies for an equitable adjustment it should include documentation showing the current status of its internal contingency fund.

Comment: Need to have an acceptance as well in case no guidance needed

(3) After Contractor's internal contingency is exhausted there may be additional unanticipated costs or obstacles which are neither AURA Assumed Risks nor Contractor Assumed Risks. In such circumstances Contractor may apply to AURA for an adjustment and AURA may, acting in its sole discretion, elect to provide some adjustment to the contract terms. If contractual adjustment is insufficient to cover such unanticipated events, the Contract shall be subject to termination for convenience.

(4) If, at the end of the Contract, the Contractor has not exhausted all their internal contingency but has had adjustments to the Contract Price, Schedule, or Requirements because of agreed AURA Assumed Risks, Contractor may, acting in its sole discretion, elect to provide some reduction to the final contract price

(5) AURA will maintain reserves to cover AURA Assumed Risks and AURA will use this reserve to provide equitable adjustments as described above subject to the availability of funds. In the event of an AURA Assumed Risk that, in AURA's sole judgment, cannot be adequately addressed by some combination of price, schedule, or requirements adjustments within AURA's available funding and program requirements, then either party may elect to terminate this Contract for convenience.

(6) If Contractor feels that AURA's response to an application for an equitable adjustment incorrectly applies the principles given above and that the parties have been unable to resolve within sixty (60) days, the application shall be mediated in good faith. The Contractor may request that the matter be resolved by a committee made up of 3 professionals in the technical field of expertise who do not have any conflicts of interest in deciding the issue. In such case Contractor will pick one of the committee members, AURA will pick the second, and then those two committee members will pick the third. The party's shall share the cost of such mediation. This committee shall have access to any and all documentation and/or information available from AURA and/or Contractor that they deem necessary to resolve the issue. This committee must accept as given AURA's determinations regarding: A. The funding AURA has available for equitable adjustments of this Contract; B. The acceptable range of adjustments to the Requirements or Schedule. AURA and Contractor shall be bound by the determination of this committee, provided, however, either party reserves the right to terminate this Contract for convenience regardless of the committee's determination.

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

IN WITNESS WHEREOF, this Contract is executed by the parties hereto as of the date first written above.

ASSOCIATION OF UNIVERSITIES FOR
RESEARCH IN ASTRONOMY, INC. –
GEMINI OBSERVATORY

By: _____

(Print name and title)_____

CONTRACTOR

By: _____

Exhibit A: Statement of Work
to
AURA Contract No. 0525280-GEM00_____
Design and Fabrication of PRVS Instrument.

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

Exhibit B: Terms and Conditions AURA Contract No. 0525280-GEM00_____

DEFINITIONS. (a) "FAR" refers to the Federal Acquisition Regulations which can be found at <http://www.arinet.gov/far/>

(b) "AURA" refers to the Association of Universities for Research in Astronomy, Inc., an Arizona Corporation.

(c) The term "this agreement" refers to this contract.

(d) The term "Vendor" refers to the Contractor as defined in the

Main Document.

COMMUNICATION. All communications concerning administration of this agreement must be furnished solely to the AURA Contracts Manager at the address given in this agreement. Communications of a technical nature only may be directed to the AURA Technical Representative designated by the Contracts Manager.

TECHNICAL DIRECTION. The Technical Representative identified by the Gemini Contracts Manager is authorized to provide technical information needed by Vendor, but is not authorized to direct Vendor to do anything that will affect the price, schedule, requirements, or scope of the work, or which may give rise to a claim for extra costs or schedule delay. If the Technical Representative, or anyone at AURA, gives Vendor any direction that will result in a change to the price, schedule, requirements, or scope of work, or which may give rise to a claim for extra costs or schedule delay vendor shall not implement the direction but shall instead contact the Gemini Contracts Manager and request guidance on how to proceed.

AMENDMENTS AND CHANGE ORDERS. (a) Nothing in this agreement, including the scope or qualities of the services or goods provided, may be modified except by means of a written document (amendment or change order) signed by the Gemini Contracts Manager and accepted by the vendor. Verbal agreements or direction from anyone other than the Gemini Contracts Manager to modify or add work or requirements are void; if anyone at AURA gives vendor any direction that will result in a change to the price, schedule, requirements, or scope of work, or which may give rise to a claim for extra costs or schedule delays, vendor shall not implement the direction but shall instead contact the Gemini Contracts Manager and request guidance on how to proceed.

(b) An amendment describes the modification and the agreed price adjustment and is signed by both vendor and the Gemini Contracts Manager.

COPYRIGHTABLE MATERIAL. (a) The term "Subject Writing" refers to any copyrightable material which is produced by Vendor in the course of performing the work under this agreement and which is either delivered to AURA or is distributed to any persons. Subject Writings include such items as drawings, documents, reports, books, journal articles, software, databases, sound recordings, photographs, artwork, and videotapes.

(b) Except as otherwise specified in this agreement, the Vendor may own or permit others to own the copyright in all Subject Writings. Vendor agrees that if it or anyone else does own copyright in a Subject Writing, then for each Subject Writing: (1) AURA, and any subsequent organization operating the Gemini Observatory, shall have nonexclusive, nontransferable, irrevocable, royalty-free license to exercise throughout the world all rights provided by copyright for purposes related to operating the Gemini Observatory; and (2) the parties to the Gemini Agreement shall have nonexclusive, nontransferable, irrevocable, royalty-free license to exercise throughout the world all rights provided by copyright for research purposes. These licenses shall include the rights to reproduce, prepare derivative works, distribute (but not sell) copies to the public, and perform publicly and display publicly, by or on behalf of the license holder.

(c) The Vendor agrees to acquire, through written agreement or an employment relationship, the ability to comply with the requirements of the preceding paragraphs. The Vendor further agrees that any transfer of copyright or any other rights to a Subject Writing, by it or anyone whom it has allowed to own such rights, will be made subject to the requirements of this section.

(d) Except as provided otherwise in this agreement, there shall be no confidentiality restrictions on Subject Writings and AURA may disclose any of them to any person or organization subject to the rights granted in (b) above

(e) Vendor may place restrictions on disclosure of proprietary information acquired or created by Vendor prior to the date of this Contract that was not developed for the work for the Gemini Observatory described in this agreement, or proprietary information created under this Contract which describes a patentable innovation for which Vendor has a good faith intention to file a patent application (collectively, the "Proprietary Information"), provided, however, that AURA, and any successor

Comment: This paragraph conflicts with 7.3(d) above

Comment: specifically identify who are the parties to the Gemini Agreement.

Comment: Penn State suggest we negotiate a separate confidentiality agreement if we or any of the lower-tier subs will have proprietary information as background rights that need to be protected.

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

operator of the Gemini Observatory shall be permitted to disclose Proprietary Information to its employees and agents for purposes of Gemini Observatory operations. Material shall only be considered to be "Proprietary Information" if it is clearly marked as such by Vendor and otherwise meets the definition given in this paragraph.

ELECTRONIC AND FAX SIGNATURES; WRITTEN COMMUNICATIONS. (a) Documents relating to this agreement may be effectively signed by either: (1) Electronically signing a PDF file using the Adobe Acrobat Digital Signature Tool; or (2) Signing a hard copy and then either faxing it to the recipient or scanning it and emailing it to the recipient as a scanned document; or (3) Sending an original hard-copy.

(b) When this agreement requires that something be "in writing" an email communication is sufficient to meet this requirement.

PRICES AND PAYMENT LIMIT. Except as specifically noted, the prices given in this agreement include all charges related to the goods or services provided, including, but not limited to storage, packing, transportation, taxes, overhead, indirect costs etc. AURA shall not be obligated to reimburse vendor for any costs in addition to the agreed price unless such costs are specifically listed in this agreement.

INDEMNIFICATION. (a) To the extent permitted by law, Vendor shall defend, indemnify, and hold harmless AURA, its directors, officers, successors, and employees, from any claim, loss, damage or expense (including reasonable attorney's fees), including any incidental or consequential damages, which is attributable to bodily injury, death, or property damage and which directly results from the performance of this Agreement, but only in proportion to and to the extent such claim, loss, damages or expense are caused by or result from the negligent or intentional acts or omissions of Vendor or its employees or agents.

(b) To the extent permitted by law, AURA shall defend, indemnify, and hold harmless Vendor, its directors, officers, successors, and employees, from any claim, loss, damage or expense (including reasonable attorney's fees), including any incidental or consequential damages, which is attributable to bodily injury, death, or property damage and which directly results from the performance of this Agreement, but only in proportion to and to the extent such claim, loss, damages or expense are caused by or result from the negligent or intentional acts or omissions of AURA or its employees or agents.

(c) These indemnity obligations will survive the expiration or termination of this agreement.

(d) Each party shall be responsible for its negligent acts or omissions and the negligent acts or omissions of its employees, officers or directors, to the extent allowed by law.

CHOICE OF LAW. The laws of the State of Arizona, without regard to conflict of laws provisions, shall govern the formation, performance and the legal enforcement of this agreement, and venue for any judicial action shall be Tucson, Arizona.

Comment: Ideally would be UK - some compromise may be needed

INDEPENDENT CONTRACTOR. The vendor is an independent contractor and not an agent or employee AURA. Vendor has no authority to bind AURA to any agreements or liability except as expressly set forth herein. Vendor shall be solely responsible for the acts of vendor, its employees, and agents.

TERMINATION FOR DEFAULT/CAUSE. (a) If the Vendor refuses or fails to timely perform any of the provisions of this agreement with such diligence as will ensure its completion within the time specified in this agreement, AURA may notify the Vendor in writing of the non-performance, and if not corrected within the 90 days specified, AURA, acting reasonably, may terminate the Vendor's right to proceed with this agreement or such part of this agreement as to which there has been delay or a failure to properly perform. The Vendor shall continue performance of the agreement to the extent it is not terminated and AURA shall reimburse Vendor for actual costs incurred, plus non-cancelable commitments.. Payment for completed services performed and accepted shall be at the price(s) provided in this agreement.

(b) The Vendor shall not be in default by reason of any failure in performance of this agreement in accordance with its terms if such failure arises out of acts of God; acts of the public enemy; acts of the State and any governmental entity in its sovereign or contractual capacity; fires; floods; epidemics; quarantine restrictions; strikes or other labor disputes; freight embargoes; or unusually severe weather.

(c) In Section 7 of the main document of this agreement the parties have set forth a set of principles and procedures for modifying the contract price, schedule, and requirements in the event that certain technical or programmatic risks are encountered. It is the intent of the parties that these procedures, when and where applicable as described in that section, will be used to modify the contract so as to avoid some situations that would otherwise be a default in performance by Vendor, and that Vendor shall not be deemed to be in default under this agreement unless and until any available modifications available under that section have been exhausted.

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

(d) If after termination of the Vendor's right to proceed under this clause, it is determined for any reason that the Vendor was not in default under the provisions (a), (b), or (c) of this clause, or that the delay was otherwise excusable, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to the termination for convenience clause.

TERMINATION FOR CONVENIENCE. AURA may terminate this agreement in whole or in part, for its convenience. AURA shall give written notice of the termination to the vendor specifying the part of the agreement terminated and when termination becomes effective. Upon receipt of the notice of termination, the Vendor shall incur no further obligations except to the extent necessary to mitigate costs of performance. The amount due to Vendor upon termination shall be for all services performed and expenses incurred prior to the effective date of termination of the agreement and for any uncancellable obligations incurred prior to the effective date of termination of the agreement, calculated as described in FAR 52.249-5 (Educational and Other Nonprofit Institutions). Regardless of any other provisions, the amount of the termination liability under this paragraph shall not exceed the amount of the price provided in this agreement plus a reasonable cost for settlement expenses. Vendor may terminate this agreement for convenience if AURA is unable to secure funds necessary for performance of the Work.

PUBLICITY. Vendor shall not publicize or advertise in any manner anything relating to this agreement without getting prior written approval from AURA for each publicity/advertising item. AURA may require acknowledgements of its sponsors as a condition of approval.

TIME OF ESSENCE. Time is of the essence in the execution and performance under this agreement.

COMPLETE AGREEMENT/WAIVER. This agreement is the exclusive expression of the parties' agreement and replaces all prior understandings, whether written or verbal. The terms of this agreement may not be altered or explained by course of dealing, course of performance, trade custom, or consistent additional terms. A course of performance by the parties which is inconsistent with the terms of this agreement shall not constitute a modification or waiver of those terms.

OSHA AND MSDS SHEETS. For work done within the United States of America all equipment and materials used in the performance of this agreement must conform to the standards required by the William-Steiger Occupational Safety and Health Act of 1970. Bidders must furnish Material Safety Data Sheets (MSDS) for any regulated chemicals, equipment or hazardous materials at the time of delivery.

EQUAL EMPLOYMENT OPPORTUNITY. For work performed within the United States of America Vendor shall comply with Executive Order 11246, "Equal Employment Opportunity," as amended by E.O. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and as supplemented by regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

DEBARMENT. No part of the work shall be subcontracted to parties listed on the General Services Administration's List of Parties Excluded from Federal Procurement or Nonprocurement Programs in accordance with E.O.s 12549 and 12689, "Debarment and Suspension." By signing this contract or performing this purchase order vendor certifies that neither it nor any of its principle employees is on this debarred list. Vendor shall require a similar certification from all firms awarded subcontracts over \$25,000.

ASSIGNMENT/SUBCONTRACTING. AURA may assign its rights under this agreement to either the National Science Foundation or to an organization succeeding it as the operator of the Gemini Observatory. Vendor shall not assign or delegate its rights/responsibilities under this agreement without prior written permission from AURA, and any assignment without such permission shall be void. Any assignment with AURA's permission shall not relieve vendor of responsibility for successful performance of the work. Vendor may not subcontract any portion of the work, not including purchases of commercially available items, without prior written permission from AURA.

LABOR DISPUTES. If the vendor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this agreement, the Vendor shall immediately give notice, including all relevant information, to AURA. This provision shall be included in all subcontracts issued by vendor related to the work.

PUBLICATIONS. (a) The vendor is responsible for assuring that an acknowledgment of NSF support is made:

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

1. In any publication (including World Wide Web pages) of any material based on or developed under this contract, in the following terms: "This material is based upon work supported by the National Science Foundation under Cooperative Agreement No. AST0525280."

2. NSF support also must be orally acknowledged during all news media interviews, including popular media such as radio, television and news magazines.

(b) The Vendor is responsible for assuring that every publication of material (including World Wide Web pages) based on or developed under this award, except scientific articles or papers appearing in scientific, technical or professional journals, contains the following disclaimer: "Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation."

(c) The Vendor is responsible for assuring that two copies of every publication of material based on or developed under this award, clearly labeled with the cooperative agreement number and other appropriate identifying information, are sent to the cognizant NSF Program Officer promptly after publication.

(d) All reports and publications resulting from this Contract are encouraged to use the metric system of weights and measures.

CLEAN AIR AND WATER ACTS. For work performed within the United States of America Vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401 et seq.) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251 et seq.). Violations shall be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

BYRD ANTI-LOBBYING AMENDMENT. By signing this contract vendor certifies that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of Gemini, any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining this contract or any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to AURA.

ACCESS TO RECORDS. AURA, the NSF, the Comptroller General of the United States, or any of their duly authorized representatives, shall have reasonable access to any books, documents, papers and records of the vendor which are directly pertinent to this agreement for the purpose of making audits, examinations, excerpts and transcriptions for up to three (3) years after final payment is received by Vendor.

CONTRACT WORK HOURS AND SAFETY STANDARDS ACT. For work performed within the United States of America vendor shall comply with Sections 102 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-333), as supplemented by Department of Labor regulations (29 CFR part 5). Under Section 102 of the Act, each vendor shall be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than 1 ½ times the basic rate of pay for all hours worked in excess of 40 hours in the work week. Section 107 of the Act is applicable to construction work and provides that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous.

PATENT RIGHTS (APRIL, 1992)

(a) Definitions.

1. **INVENTION** means any invention or discovery which is or may be patentable or otherwise protectable under Title 35 of the USC, to any novel variety of plant which is or may be protected under the Plant Variety Protection Act (7 USC §§2321 et seq.).

2. **SUBJECT INVENTION** means any invention of the Vendor conceived or first actually reduced to practice in the performance of work under this contract.

3. **PRACTICAL APPLICATION** means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

4. **MADE** when used in relation to any invention means the conception or first actual reduction to practice of such invention.

5. **NON-PROFIT ORGANIZATION** means a domestic

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

university or other institution of higher education or an organization of the type described in Section 501(c)(3) of the Internal Revenue Code of 1954 (26 USC §501(c)) and exempt from taxation under Section 501(a) of the Internal Revenue Code (26 USC §501(a)) or any domestic non-profit scientific or educational organization qualified under a State non-profit organization statute.

6. NSF means the National Science Foundation, an agency of the federal government of the United States of America.

(b) Allocation of Principal Rights. The Vendor may retain the entire right, title, and interest throughout the world to each subject invention subject to the provisions of this Patent Rights clause and 35 USC §203. With respect to any subject invention in which the Vendor retains title, the Federal Government shall have a non-exclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the U. S. the subject invention throughout the world. With respect to any subject invention in which the Vendor retains title, the non-U.S. Parties to the Gemini Agreement shall have a non-exclusive, nontransferable, irrevocable, paid-up license to practice or have practiced on their behalf the subject invention throughout the world for research purposes.

(c) Invention Disclosure, Election of Title and Filing of Patent

Applications by Vendor.

1. The Vendor will disclose each subject invention to AURA within two months after the inventor discloses it in writing to Vendor personnel responsible for the administration of patent matters. The disclosure to AURA shall be in the form of a written report and shall identify the contract under which the invention was made and the inventor(s). It shall be sufficiently complete in technical detail to convey a clear understanding of the nature, purpose, operation, and, to the extent known, the physical, chemical, biological or electrical characteristics of the invention. The disclosure shall also identify any publication, on sale or public use of the invention and whether a manuscript describing the invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. In addition, after disclosure to AURA, the Vendor will promptly notify AURA of the acceptance of any manuscript describing the invention for publication or of any on sale or public use planned by the Vendor.

2. The Vendor will elect in writing whether or not to retain title to any such invention by notifying AURA within two years of disclosure to AURA. However, in any case where publication, on sale, or public use has initiated the one-year statutory period wherein valid patent protection can still be obtained in the U. S. , the period for election of title may be shortened by NSF to a date that is no more than 60 days prior to the end of the statutory period.

3. The Vendor will file its initial patent application on an invention to which it elects to retain title within one year after election of title or, if earlier, prior to the end of any statutory period wherein valid patent protection can be obtained in the U. S. after a publication, on sale, or public use. The Vendor will file patent applications in additional countries or international patent offices within either ten months of the corresponding initial patent application, or six months from the date when permission is granted by the Commissioner of Patents and Trademarks to file foreign patent applications when such filing has been prohibited by a Secrecy Order.

4. Requests for extension of the time for disclosure to NSF, election, and filing under subparagraphs 1. , 2. , and 3. may, at the discretion of NSF, be granted.

(d) Conditions When the Government May Obtain Title. The Vendor will convey to NSF, upon written request, title to any subject invention:

1. if the Vendor fails to disclose or elect the subject invention within the times specified in paragraph c. above, or elects not to retain title; provided that NSF may only request title within 60 days after learning of the failure of the Vendor to disclose or elect within the specified times;

2. in those countries in which the Vendor fails to file patent applications within the times specified in paragraph c. above, but prior to its receipt of the written request of NSF, the Vendor shall continue to retain title in that country; or

3. in any country in which the Vendor decides not to continue the prosecution of any application for, to pay the maintenance fees on, or defend in a reexamination or opposition proceeding on, a patent on a subject invention.

(e) Minimum Rights to Vendor.

1. The Vendor will retain a non-exclusive royalty-free license throughout the world in each subject invention to which the Government obtains title, except if the Vendor fails to disclose the subject invention within the times specified in paragraph c. above. The Vendor's license extends to its domestic subsidiaries and affiliates, if any, within the corporate structure of which the Vendor is a party and includes the right to grant sublicenses of the same scope to the extent the Vendor was legally obligated to do so at the time the contract was awarded. The license is transferable only with the approval of NSF except when transferred to the successor of that

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

part of the Vendor's business to which the invention pertains.

2. The Vendor's domestic license may be revoked or modified by NSF to the extent necessary to achieve expeditious practical application of the subject invention pursuant to an application for an exclusive license submitted in accordance with applicable provisions at 37 CFR §404. This license will not be revoked in that field of use or the geographical areas in which the Vendor has achieved practical application and continues to make the benefits of the invention reasonably accessible to the public. The license in any foreign country may be revoked or modified at discretion of NSF to the extent the Vendor, its licensees, or its domestic subsidiaries or affiliates have failed to achieve practical application in that foreign country.

3. Before revocation or modification of the license, NSF will furnish the Vendor a written notice of its intention to revoke or modify the license, and the Vendor will be allowed thirty days (or such other time as may be authorized by NSF for good cause shown by the Vendor) after the notice to show cause why the license should not be revoked or modified. The Vendor has the right to appeal, in accordance with applicable regulations in 37 CFR §404 concerning the licensing of Government-owned inventions, any decision concerning the revocation or modification of its license.

(f) Vendor Action to Protect Government's Interest.

1. The Vendor agrees to execute or to have executed and promptly deliver to NSF all instruments necessary to: (i) establish or confirm the rights the Government has throughout the world in those subject inventions for which the Vendor retains title; and (ii) convey title to NSF when requested under paragraph d. above, and to enable the Government to obtain patent protection throughout the world in that subject invention.

2. The Vendor agrees to require, by written agreement, its employees, other than clerical and non-technical employees, to disclose promptly in writing to personnel identified as responsible for the administration of patent matters and in a format suggested by the Vendor each subject invention made under this contract in order that the Vendor can comply with the disclosure provisions of paragraph c. above, and to execute all papers necessary to file patent applications on subject inventions and to establish the Government's rights in the subject inventions. The disclosure format should require, as a minimum, the information requested by paragraph c. 1. above. The Vendor shall instruct such employees through the employee agreements or other suitable educational programs on the importance of reporting inventions in sufficient time to permit the filing of patent applications prior to U. S. or foreign statutory bars.

3. The Vendor will notify NSF of any decision not to continue prosecution of a patent application, pay maintenance fees, or defend in a reexamination or opposition proceeding on a patent, in any country, not less than 30 days before the expiration of the response period required by the relevant patent office.

4. The Vendor agrees to include, within the specification of any U. S. patent application and any patent issuing thereon covering a subject invention, the following statement: "This invention was made with Government support under (identify the contract) awarded by the National Science Foundation. The Government has certain rights in this invention. "

5. The Vendor or its representative will complete, execute and forward to NSF a confirmation of a License to the U. S. Government and the page of a United States patent application that contains the Federal support clause within two months of filing any domestic or foreign patent application.

(g) Subcontracts. The Vendor will include this Patent Rights clause, suitably modified to identify the parties, in all subcontracts, regardless of tier, for experimental, developmental or research work. The subcontractor will retain all rights provided for the Vendor in this Patent Rights clause, and the Vendor will not, as part of the consideration for awarding the subcontract, obtain rights in the subcontractors' subject inventions.

(h) Reporting on Utilization of Subject Inventions. The Vendor agrees to submit on request periodic reports no more frequently than annually on the utilization of a subject invention or on efforts at obtaining such utilization that are being made by the Vendor or its licensees or assignees. Such reports shall include information regarding the status of development, date of first commercial sale or use, gross royalties received by the Vendor and such other data and information as NSF may reasonably specify. The Vendor also agrees to provide additional reports in connection with any march-in proceeding undertaken by NSF in accordance with paragraph j. of this Patent Rights clause. As required by 35 USC §202(c)(5), NSF agrees it will not disclose such information to persons outside the Government without the permission of the Vendor.

(i) Preference for United States Industry. Notwithstanding any other provision of this Patent Rights clause, the Vendor agrees that neither it nor any assignee will grant to any person the exclusive right to use or sell any subject invention in the U. S. unless such person agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

substantially in the U. S. However, in individual cases, the requirement for such an agreement may be waived by NSF upon a showing by the Vendor or its assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the U. S. or that under the circumstances domestic manufacture is not commercially feasible.

(j) March-in Rights. The Vendor agrees that with respect to any subject invention in which it has acquired title, NSF has the right in accordance with procedures at 37 CFR §401. 6 and NSF regulations at 45 CFR §650. 13 to require the Vendor, an assignee or exclusive licensee of a subject invention to grant a non-exclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances and if the Vendor, assignee, or exclusive licensee refuses such a request, NSF has the right to grant such a license itself if NSF determines that:

1. such action is necessary because the Vendor or assignee has not taken or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use;

2. such action is necessary to alleviate health or safety needs which are not reasonably satisfied by the Vendor, assignee, or their licensees;

3. such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the Vendor, assignee, or licensee; or

4. such action is necessary because the agreement required by paragraph i. of this Patent Rights clause has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the U. S. is in breach of such agreement.

(k) Special Provisions for Contracts with Non-profit Organizations. If the Vendor is a non-profit organization, it agrees that:

1. rights to a subject invention in the U. S. may not be assigned without the approval of NSF, except where such assignment is made to an organization which has as one of its primary functions the management of inventions, provided that such assignee will be subject to the same provisions as the Vendor;

2. the Vendor will share royalties collected on a subject invention with the inventor, including Federal employee co-inventors (when NSF deems it appropriate) when the subject invention is assigned in accordance with 35 USC §202(e) and 37 CFR §401. 10;

3. the balance of any royalties or income earned by the Vendor with respect to subject inventions, after payment of expenses (including payments to inventors) incidental to the administration of subject inventions, will be utilized for the support of scientific or engineering research or education; and

4. it will make efforts that are reasonable under the circumstances to attract licensees of subject inventions that are small business firms and that it will give preference to a small business firm if the Vendor determines that the small business firm has a plan or proposal for marketing the invention which, if executed, is equally likely to bring the invention to practical application as any plans or proposals from applicants that are not small business firms; provided that the Vendor is also satisfied that the small business firm has the capability and resources to carry out its plan or proposal. The decision whether to give a preference in any specific case will be at the discretion of the Vendor. However, the Vendor agrees that the Secretary of Commerce may review the Vendor's licensing program and decisions regarding small business applicants, and the Vendor will negotiate changes to its licensing policies, procedures or practices with the Secretary when the Secretary's review discloses that the Vendor could take reasonable steps to implement more effectively the requirements of this paragraph k. 4.

(l) Communications. All communications required by this Patent

Rights clause should be sent to:
Patent Assistant
Office of the General Counsel
National Science Foundation
4201 Wilson Boulevard
Arlington, VA 22230

PRECISION RADIAL VELOCITY SPECTROMETER

Document Number:	PRVS—BDG-00002-0001
Issue:	1.0
Category:	Management
Status:	Issued
Author:	David Lunney
Date:	20 th September 2006

Last Page