

Department of Physics and Astronomy
University of Sheffield
Sheffield S3 7RH

FAO: Vikram Dhillon

31 May 1999

Our Ref: Ucam_00L001gm.069

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UKATC Effort for the ULTRACAM Project

Dear Vikram,

I believe that as part of your proposal for funding of the ULTRACAM Project you have been asked to obtain some assurances from the UKATC as to our ability to meet your requirements in an appropriate timescale and for the given price. I have reviewed the cost estimates prepared by our Derek Ives and have included (as a separate document) a final version which allows for some inflation over the course of the project and corrects some minor errors in dsy Cost.

I have also had a chance to examine the effort available in the UKATC Business Plan and believe that appropriate staff will be available to complete your project based on the following assumptions:-

- Your Funding will not start until October 1999 at which point a small amount of effort could be provided to agree requirements, milestones etc and start CCD procurement.
- The main body of Project work would not be started until the Summer of 2000
- The requirements are not significantly altered from the system described in the quote, in particular vis a vis the simple interface for the data acquisition software.
- The UKATC work would then be completed within at very worst a 2 year period though we would expect to be more like 18 months (plus initial commissioning support).

I hope this letter meets the requirements of the Review Panel and that your application is successful. If more information is required please do not hesitate to contact me.

Yours Sincerely



Ian Bryson
Programme Manager (Acting)

cc: Colin Cunningham, Derek Ives, Adrian Russell

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UKATC Estimate for the ULTRACAM Project

Dear Vikram,

As mentioned in my letter (ref Ucam_00L001gm.069) please find attached a final cost estimate for our contribution to the ULTRACAM project. As mentioned in that letter I have reviewed Derek's latest estimate and corrected a minor error in the cost of a dsy but also added in some allowance for inflation over the course of the project. Although our discussions by phone indicated that you may wish to remove one or two elements from the quote you pass on to the Review panel (because no longer required or included elsewhere) I have left our quote with the full set of information.

1. UKATC deliverables to ULTRACAM

The following gives a brief description of the UKATC's expected contribution to the project:-

- 3 x CCD cameras, cryogenically mounted in LN2 dewars using standard RGO faceplate mounting. Option for one camera to be an "Astronomy Enhanced" version
- 1 x SDSU 6 channel SDSU controller programmed with relevant low level code.
- 1 x VME system to act as data acquisition system. This system will NOT come with a real time display. It will also only be supplied with a very simple User Command Interface. It is envisaged that the VME system will write the data via a network link to a UNIX machine which will then write the data to disk. The user can then display the images using standard astronomical software and image display tools.

The UKATC contribution DOES NOT include:-

UNIX control or display Computer

Data Reduction Computer

Hard Disc Space - >100Mbytes will be required for one night's data

Back up tape drives

Pipeline data reduction software

2. Breakdown of Costings

The UKATC costings are broken down below (requisitions based on current (1999) prices):-

2.1 Green Camera

EEV47-20 STANDARD QE process	=	£9k each (excl. VAT)
Oxford Instruments LN2 cryostat	=	£6k
Hermetic connectors (minimum order)	=	£1.5k
Cryostat Internals and wiring etc.	=	£1.5k
Faceplate and AR coated window etc.	=	£3k
New Preamp and Temperature Control	=	£3k

Total approx. capital cost per camera including VAT	= £28k
Effort for mechanics, electrical and CCD characterization	= 0.20 d.s.y.

2.2 Red Camera (as above)

Total approx. capital cost per camera including VAT	= £28k
Effort for mechanics, electrical and CCD characterization	= 0.20 d.s.y.

2.3 Blue Camera

Same as above but **ENHANCED** QE process CCD which is double the price of the standard process.

Total approx. capital cost per camera including VAT	= £39k
Effort for mechanics, electrical and CCD characterization	= 0.20 d.s.y.

2.4 CCD Controller

Includes 12 slot chassis, 3 clock cards and 3 video cards, PSU and VME interface card.

Total Cost of Controller including VAT	= £37k
Effort for software development	= 0.20 d.s.y.

2.5 VME Hardware Costs

VME GPS card	-	£5k
VME Processor	-	£7k
VME Chassis	-	£4k
VxWorks S/W	-	£1k

TOTAL VME costs	= £20k pounds
Software effort required	= 0.80 dsy

2.6 Miscellaneous Costs

Commissioning, Travel and Packing costs are approximately £6k.

3.0 Summary Costing

Making some assumptions regarding Timescales, the need for deposits (50%) when ordering the arrays etc

Item	99/00	00/01	01/02	Totals
Capital requisitions (£k)	22	135.0	6.5	163.5
Staff Costs (dsy)	0.1	1.0	0.5	1.6
Staff Costs (£k)	5.2	53.8	28.5	87.5
Total Cost (£k)	27.2	188.8	35.0	251.0

Ian Bryson

Ian Bryson
Programme Manager (Acting)

Department of Physics and Astronomy
University of Sheffield
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FAO: Vikram Dhillon

7 June 1999

Our Ref: Ucam_00L003gm.069

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UKATC Effort for the ULTRACAM Project
Revised RG2 Grant Application

Dear Vikram,

I have reviewed the RG2 form you sent me based on our quote (Ref 00L002gm.069) and the revisals agreed in a telecon between you and Derek Ives. The figures in the form relating to the UKATC involvement are acceptable to the UKATC.

For completeness I shall shordy update our quotation with the revisals but meantime I trust that this letter will satisfy the needs of the Review Panel. Once again we wish you every success with your application.

Yours Sincerely



Ian Bryson
Programme Manager (Acting)

cc: Colin Cunningham, Derek Ives, Adrian Russell

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FAO: Vikram Dhillon

7 June 1999

Our Ref: Ucam_00L002gm.069.v2
(version 2)

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UKATC Estimate for the ULTRACAM Project

Dear Vikram,

As mentioned in my letter (ref Ucam_00L003gm.069) please find attached a revised final cost estimate for our contribution to the ULTRACAM project. This includes the original inflation and dsy rate changes plus the revised quotations for some of the hardware. I have also removed the commissioning costs since I believe you are covering that elsewhere in the grant.

1. UKATC deliverables to ULTRACAM

The following gives a brief description of the UKATC's expected contribution to the project:-

- 3 x CCD cameras, cryogenically mounted in LN2 dewars using standard RGO faceplate mounting. No "Astronomy Enhanced" CCD is now required.
- 1 x SDSU 6 channel SDSU controller programmed with relevant low level code.
- 1 x VME system to act as data acquisition system. This system will NOT come with a real time display. It will also only be supplied with a very simple User Command Interface. It is envisaged that the VME system will write the data via a network link to a UNIX machine which will then write the data to disk. The user can then display the images using standard astronomical software and image display tools.

The UKATC contribution DOES NOT include:-

UNIX control or display Computer
Data Reduction Computer
Hard Disc Space - >100Mbytes will be required for one night's data
Back up tape drives
Pipeline data reduction software
Commissioning costs in La Palma or other location

2. Breakdown of Costings

The UKATC costings are broken down below (requisitions based on current (1999) prices):-

2.1 Green Camera

EEV47-20 STANDARD QE process	=	£9k each (excl. VAT)
Oxford Instruments LN2 cryostat	=	£6k
Hermetic connectors (minimum order)	=	£1.5k
Cryostat Internals and wiring etc.	=	£1.5k
Faceplate and AR coated window etc.	=	£3k
New Preamp and Temperature Control	=	£3k

Total approx. capital cost per camera including VAT	= £28k
Effort for mechanics, electrical and CCD characterization	= 0.20 d.s.y.

2.2 Red Camera (as above)

Total approx. capital cost per camera including VAT	= £28k
Effort for mechanics, electrical and CCD characterization	= 0.20 d.s.y.

2.3 Blue Camera

Total approx. capital cost per camera including VAT	= £28k
Effort for mechanics, electrical and CCD characterization	= 0.20 d.s.y.

2.4 CCD Controller

Includes 12 slot chassis, 3 clock cards and 3 video cards, PSU and VME interface card.

Total Cost of Controller including VAT	= £30k
Effort for software development	= 0.20 d.s.y.

2.5 VME Hardware Costs

VME GPS card	-	£5k
VME Processor	-	£7k
VME Chassis	-	£4k
VxWorks S/W	-	£1k

TOTAL VME costs including VAT	= £17k pounds
Software effort required	= 0.80 dsy

2.6 Miscellaneous Costs

Commissioning, Travel and Packing costs are no longer included

3.0 Summary Costing

Making some assumptions regarding Timescales, Inflation, the need for deposits (50%) when ordering the arrays etc

Item	99/00	00/01	01/02	Totals
Capital requisitions (£k)	22	112.0	0	144.0
Staff Costs (dsy)	0.1	1.0	0.5	1.6
Staff Costs (£k)	5.2	53.8	28.5	87.5
Total Cost (£k)	27.2	188.8	35.0	251.0



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Programme Manager (Acting)