

REQUEST FOR TENDER

for

Antenna for the AuScope Very Long Baseline Interferometry (VLBI) Array

**University of Tasmania
Asset Management Services
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EXPLANATION OF DOCUMENTS

The tender documentation for these works includes

1. CONDITIONS OF TENDER (PART A)

The Conditions of Tender (“Conditions”) are the conditions upon which the University will receive and evaluate Tenders. Failure to strictly observe these conditions may result in a Tender being excluded from further consideration.

2. UNIVERSITY REQUIREMENTS (PART B)

The University’s Requirements contain some general information for tenderers together with details of the University’s requirements to enable the University’s Tender Panel to assess each Tender.

3. COVER SHEET FOR TENDERERS (PART C)

The Cover Sheet for Tenderers is a required form that must be returned as part of the Tender. A Tender may be excluded from further consideration if this form is not used.

4. FORM OF CONTRACT (PART D)

The Terms and Conditions of AS 4910-2002 Australian Standard General Conditions of Contract for the Supply of Equipment with Installation, incorporating Annexure A, B and C as appropriate.

PART A
CONDITIONS OF TENDER

1. INTERPRETATION

Unless expressly indicated otherwise, the terms of this RFT shall be interpreted in accordance with the Dictionary annexed to these Conditions.

2. TENDER CLOSING TIME

Tenders conforming to this RFT must be lodged in accordance with these Conditions no later 4 PM AEST, Friday December 7, 2007 ("Closing Time").

3. LODGEMENT

3.1 The original Tender (marked "Original"), must be placed in an envelope clearly marked as "TENDER" with the Tender Title, Closing Time and Tenderer's name, and lodged prior to Closing Time by:

(a) Placing it in the Tender Box
Level 2
Corporate Services Building
TT Flynn St (off Churchill Ave)
Sandy Bay 7005
Tasmania
Australia

OR

(b) posting it to the Tender Box so that it is received by the University before the Closing Time.

Private Bag 35
Hobart, Tasmania
Australia 7001

3.2 Oral tenders or tenders lodged by facsimile or email will not be considered.

3.3 No responsibility will be accepted for any Tender lodged or sent to an incorrect location.

4. UNAUTHORISED COMMUNICATION

4.1 Tenderers must direct all communications concerning this RFT through the Contact Officer unless directed otherwise by the Contact Officer. Unauthorised communication by a Tenderer with other staff of the University may lead to the exclusion from consideration of a Tender lodged by that Tenderer.

4.2 The University reserves the right to:

(a) not answer a question asked by a Tenderer; and

(b) provide any answers to questions raised by a Tenderer to any other Tenderer, on a non-attributable basis.

5. CONTACT OFFICER

For the purposes of this tender, the Contact Officer is:

Jim Lovell
AuScope VLBI Project Scientist
University of Tasmania
Locked Bag 21
Hobart Tasmania 7001
Tel: +61 3 6226 7256
Fax: +61 3 6226 2410
Email: Jim.Lovell@utas.edu.au

6. RFT TIMETABLE

The University's intended timetable for this RFT is as follows:

Issue date of tender:	Monday October 29, 2007
Closing Time:	4pm AEST, Friday December 7, 2007
Conclusion of tender evaluation:	Friday 4 January 2008
Finalisation and signature of Contract:	Friday 1 February 2008
Hand-over of Hobart antenna to University	1 October 2008

7. VARIATION OF RFT

The University may, in its absolute discretion, amend this RFT or provide additional information at any time by giving written notice to:

- (a) prior to the Closing Time, all persons who have been issued with the RFT by the University and who have provided sufficient address details to enable the University to contact them; and
- (b) after the Closing Time, to all Tenderers who have lodged Tenders.

8. LATE TENDERS

- 8.1 Subject to sub-clause 3.2 above, Tenders received after the Closing Time ("Late Tenders") will not be accepted into the Tender Process unless the University, in its absolute discretion, resolves that accepting a Late Tender will not compromise the integrity of the tendering process or provide any unfair advantage to the Tenderer lodging the Late Tender.
- 8.2 Late Tenders which are not accepted, will be marked on the envelope with the time and date of receipt, and returned unopened to the Tenderer.

- 8.3 The University may request a Tenderer to provide evidence to assist it in making its decision as to whether to accept or exclude a Late Tender from the Tender Process.

9. ALTERATION OR ILLEGIBILITY

- 9.1 A Tenderer must initial any alteration made to a Tender.
- 9.2 A Tender containing alterations that are not initialled, erasures or illegible information may be excluded from consideration.
- 9.3 A Tenderer should immediately notify the Contact Officer in writing if it reasonably believes there is a discrepancy, error, ambiguity, inconsistency or omission in this RFT.

10. SUSPENSION OR CESSATION

The University may cease to proceed with, or suspend the process, or any stage of it, outlined in the RFT or any negotiations being conducted at that time with any Tenderer.

11. REJECTION OF TENDER

The University may reject a Tender that does not fully comply with the terms of the RFT.

12. PARTIAL ACCEPTANCE

The University reserves the right to accept all or part of a Tender at the price or prices tendered unless the Tender states specifically to the contrary.

13. CONFIDENTIALITY AND INTELLECTUAL PROPERTY

- 13.1 The RFT and such intellectual property rights as may exist in the information contained in the RFT shall remain the property of the University. A Tenderer is only permitted to use the RFT for the purpose of preparing a Tender in response and for the purpose of conducting any contract negotiations with the University.
- 13.2 The Tenderer must keep confidential all information concerning the University, received as a result of, or in connection with, the submission of a Tender which the University has indicated to Tenderers is confidential or which Tenderers know or ought to know is confidential.
- 13.3 All Tenders and accompanying documents become the property of the University and the Tenderer authorises the University, its officers, employees, agents and advisers to adapt, modify, disclose, reproduce or do anything else necessary (in the University's sole opinion) to the whole or any portion of the Tender for the purposes:
- (a) Tender evaluation;
 - (b) negotiating and/or entering into a contract with any party for the delivery of the University's Requirements or similar requirements;
 - (c) managing a contract with a successful Tenderer (if any); or
 - (d) anything else related to the above purposes, including governmental and parliamentary auditing and reporting requirements.

- 13.4 The University reserves the right to require that information concerning the University, received by a Tenderer as a result of, or in connection with, the submission of a Tender (and copies of such information) be either destroyed by the Tenderer or alternatively returned to the University at any time. The University may also require that the Tenderer provide evidence (in a form satisfactory to the University) that any University requirements in this respect have been fully complied with.

14. CONTENT AND FORMAT OF TENDER

- 14.1 Tenders must include all the information requested in the RFT unless expressly specified otherwise.
- 14.2 All items, features and functions specified in the RFT are the minimum information requirements for a Tender unless expressly stated otherwise.
- 14.3 The Tenderer must submit the Tender under cover of the Cover Sheet. The Cover Sheet must be completely filled in, and be accompanied by any other supplemental documents necessary to make the Tender complete. A Tenderer may reproduce the Cover Sheet in an expanded format to provide additional space for response.
- 14.4 Where a Tenderer intends to utilise a subcontractor, all of the information requested in the RFT must be provided in full for each subcontractor.

15. PRICE

- 15.1 All monetary amounts are to be expressed in Australian Dollars.
- 15.2 The Tenderer must quote all prices **without** the addition of GST.

16. CONFLICT OF INTEREST

- 16.1 Tenderers must not place themselves in a position which may, or does give rise to a conflict of interest between themselves and the University during the Tender Process.
- 16.2 If any actual or potential conflict of interest with the University arises at any time during the Tender Process, the Tenderer is to immediately notify the University in writing.
- 16.3 In the event of an actual or potential conflict of interest the University may, in its absolute discretion:
- (a) resolve any actual or potential conflict of interest with a Tenderer; or
 - (b) reject the Tender lodged by such a Tenderer; or
 - (c) take any other action it considers appropriate.

17. ALTERNATIVE TENDER

- 17.1 Tenderers are encouraged to offer options or solutions, which in a novel or innovative way, contribute to the University's ability to carry out its business in a more cost-effective manner. These may be related to the functional, performance and technical aspects of the requirements or to opportunities for more advantageous commercial arrangements. These options will be considered commercial in confidence.

- 17.2 The Tenderer may submit a Tender that does NOT comply with the University's Requirements if:
- (a) the Tenderer also lodges a Tender conforming with the University's Requirements; and
 - (b) the Tender not complying with the University's Requirements
 - A. is identified as an "Alternative Tender";
 - B. clearly specifies wherever it fails to comply with the University's Requirements;
 - C. states the reasons for each non-compliance and demonstrates, in detail, how the alternative will benefit the University; and
 - D. is accompanied with any supplementary material, together with associated prices.
- 17.3 The University reserves the right either to consider Alternative Tenders on their merits or not to consider them further.

18. TENDER CONSTITUTES BINDING OFFER

A Tender constitutes an irrevocable, unalterable offer by the Tenderer to the University which must remain valid and open to be accepted for a period of no less than 90 days from the Closing Time and may be extended by written agreement. Tenderers may state in their Tender a period of more than 90 days from the Closing Time for which their Tender remains valid for acceptance.

19. EVALUATION OF TENDERS

- 19.1 The evaluation process will be undertaken with the aim of determining which Tender represents best value for money to the University. In determining value for money, Tenders will be assessed against the following evaluation criteria:

Compliance Criteria

Compliance with:

- Conditions of Tender;
- Contract, including insurance requirements; and
- University Requirements.

Qualitative Criteria

- Capability of the Tenderer to fulfil the University's Requirements, including technical and supply competence, relevant skills, experience and availability of personnel, financial viability and demonstrated previous relevant experience;
- The degree to which the services meet the University's Requirements.

- 19.2 Following the receipt of Tenders, the University, in its absolute discretion, may:

- (a) use any relevant information obtained in relation to a Tender (through this RFT or by independent inquiry) in the evaluation of Tenders;
 - (b) enter into discussions or negotiations with any one or more Tenderers; and
 - (c) seek clarification or additional information from any Tenderer.
- 19.3 Tenderers must comply with any requests to provide additional information or clarification in relation to their Tender within the timeframe specified.
- 19.4 The University may exclude from consideration in the evaluation of Tenders additional information provided by Tenderers, whether received in response to a request or otherwise.
- 19.5 The University is not obliged to accept the lowest priced or any other Tender.

20. FORMATION OF CONTRACT

- 20.1 The successful Tenderer will be required to sign the Contract supplemented by the addition of relevant information, requirements, or variations:
- (a) contained in the successful Tender;
 - (b) arising during the Tender evaluation; and
 - (c) arising out of discussions and negotiations.
- 20.2 No contractual relationship or other obligation arises between the University and a Tenderer, for the supply of the University's Requirements, until the University and the successful Tenderer formally exchange signed counterparts of the Contract. This clause applies despite any oral or written advice to the Tenderer that a Tender is successful or has been, or will be, accepted.

21. TAXATION

The Tenderer must provide its Australian Business Number (ABN). If the Tenderer holds no ABN, the reason for not having an ABN must be stated. Should Tenderers choose not to register or disclose details of their ABN, PAYG withholding tax may apply and the University is required by law to deduct the relevant amount from any payment under the Contract and to remit the relevant amount to the Australian Taxation Office.

22. TENDERERS TO INFORM THEMSELVES

- 22.1 Tenderers are considered to have:
- (a) examined this RFT, any documents referenced in this RFT and any other information made available by the University to Tenderers for the purpose of tendering;
 - (b) examined all further information which is obtainable by the making of reasonable inquiries relevant to the risks, contingencies, and other circumstances having an effect on their Tender;
 - (c) satisfied themselves as to the correctness and sufficiency of their Tenders including Fees; and

- (d) satisfied themselves as to the terms and conditions of the Contract and its ability to comply with the Contract.

22.2 Tenders are submitted on the basis that Tenderers acknowledge that:

- (a) they do not rely on any representation, letter, document or arrangement, whether oral or in writing, or other conduct as adding to or amending these Conditions other than amendments in accordance with clause 7;
- (b) they do not rely upon any warranty or representation made by or on behalf of the University, its officers, employees, agents or advisers except as are expressly provided for in this RFT, but they have relied entirely upon their own inquiries and inspection in respect of the subject of their Tender;
- (c) the University will not be responsible for any costs or expenses incurred by Tenderers in complying with the requirements of this RFT; and
- (d) neither this RFT nor the Tender give rise to contractual obligations between the University and the Tenderer.

22.3 The University will not be liable to any Tenderer on the basis of any promissory estoppel, quantum meruit or other contractual, quasi contractual or restitutionary grounds whatsoever or in negligence as a consequence of any matter relating or incidental to a Tenderer's participation in this Tender Process including instances where:

- (a) a Tenderer is not invited to participate in any subsequent process following completion of this Tender Process;
- (b) the University varies or terminates the Tender Process;
- (c) the University decides not to contract for all or any of the requirements; or
- (d) the University exercises or fails to exercise any of its other rights under or in relation to this RFT.

23. UNIVERSITY'S RIGHTS

Without limiting its rights at law or otherwise, the University reserves the right in its absolute discretion at any time to:

- (a) cease to proceed with the process outlined in this RFT, including the right not to proceed with the RFT, and not to enter into a Contract;
- (b) allow any Tenderer to change its Tender;
- (c) call for new Tenders;
- (d) accept or reject any Tender that does not comply with this RFT;
- (e) waive or vary any obligation of any Tenderer under this RFT;
- (f) negotiate with any person who is not a Tenderer and enter into a Contract in relation to this exercise with that person on such terms as the University in its absolute discretion accepts;

- (g) add to, alter, delete or exclude any requirement including the inclusion of any additional requirements;
- (h) publish the names of the successful Tenderers; and
- (i) to forward to any other Tenderer on a non-attributable basis the University's response to any Tenderer's request for clarification on any aspect of the RFT.

25. APPLICABLE LAW

- 25.1 The law applying to the State of Tasmania applies to the RFT, and the tendering process.
- 25.2 Tenderers should familiarise themselves with all relevant legislation and policies relating to the provision of the University's Requirements including the *Freedom of Information Act 1991* (which gives members of the public rights or access to certain documents of the University's documents).
- 25.3 Where a Tenderer is currently named as not complying with the *Equal Opportunity for Women in the Workplace Act 1999* (Commonwealth), the University may exclude its Tender from further consideration.

DICTIONARY

1. In this RFT, unless a contrary intention appears, the following definitions and rules of interpretation shall apply:

"Agreement" means the Contract. These terms are used interchangeably throughout this RFT.

"Alternative Tender" means a Tender submitted pursuant to clause 17 of the Conditions;

"Business Day" means a day that is not a Saturday, a Sunday, Anzac Day or a public holiday under the *Statutory Holidays Act 2000*.

"Consultant" means the Person with whom the University enters into a contract to provide the University's Requirements;

"Contract" means the draft agreement forming Part D of this RFT.

"Closing Time" means the closing time and date for submission of Tenders pursuant to clause 2 of the Conditions;

"Contact Officer" means the person identified as Contact Officer in the Conditions;

"Cover Sheet" means the tender cover sheet forming Part C of this RFT;

"Fees" means the fees payable for services rendered by the Consultant calculated in accordance with clause 2 of the Contract;

"GST" means any tax imposed under any GST law and includes GST within the meaning of the GST Act;

"GST Act" means the *A New Tax System (Goods and Services Tax) Act 1999* (Commonwealth) as amended;

"GST Law" means the GST law as defined in the GST Act and includes any Act of the Parliament of Australia that imposes or deals with GST;

"Legislative Requirement" means any Act or subordinate legislation of the Commonwealth or Tasmanian legislature or the University's governing body.

"Person" includes a natural person, a corporation, a partnership, a board, a joint venture, an incorporated association, a government, a local government authority and an agency;

"Request For Tender" or **"RFT"** means this document inviting Tenderers to offer to deliver the University's Requirements by submitting a Tender as provided in this document;

"Services" or **"University's requirements"** means the services described in Part B of this RFT.

"Tender Box" means in the case of Tenders to be lodged in accordance with clause 3.1(b), the postal address on the cover page of this RFT.

"Tender" means the documents constituting an offer by the Tenderer to deliver the University's Requirements;

"Tender Process" means the tendering process outlined in this RFT;

"Tender Title" means the Tender Title shown on the cover page of this RFT;

"Tenderer" means a Person who offers to deliver the University's Requirements;

"University" means the University of Tasmania;

"University's Requirements" or **"Services"** means the services described in Part B of this RFT;

2. In this RFT, unless the contrary intention appears:

- (a) a reference to a clause or schedule is a reference to a clause of, or schedule to, this RFT and a reference to this RFT includes an annexure, attachment or schedule;
- (b) a reference to this RFT is a reference to this RFT as amended, varied, notated or substituted from time to time;
- (c) a reference to a statute, ordinance, code or other law includes regulations and other instruments under it and consolidations, amendments, re-enactments or replacements of any of them;
- (d) a word importing the singular includes the plural and vice versa; a word importing a gender includes each other gender and a reference to a person includes an individual, firm, body corporate, association (whether incorporated or not), government, governmental or semi-governmental body, local authority or agency;
- (e) a reference to a person includes the person's executors, administrators, successors, substitutes (including persons taking by novation), transferees and assigns;
- (f) a reference to an act matter or thing includes the whole, or any part of, that act matter or thing and a reference to a group of acts, matters, things or persons includes each act, matter, thing or person in that group;
- (g) where, under this RFT, or anything done under it, the day on, or by which, any act, matter or thing is to be done, is not a Business Day, that act matter or thing may be done on the immediately following Business Day;
- (h) where any terms and conditions are added to the RFT, it is agreed that those terms and conditions will form part of the RFT;
- (i) the use of inclusive terms such as "including" or "includes" will be read as "including, without limitation" or "includes, without limitation"; and
- (j) headings are inserted for convenience and do not affect the interpretation of this RFT.

PART B

UNIVERSITY'S REQUIREMENTS

B1 Background

As part of the recently announced *Structure and Evolution of the Australian Continent* National Collaborative Research Infrastructure Strategy (NCRIS), the University of Tasmania, together with Geoscience Australia and Curtin University are constructing a three-element Very Long Baseline Interferometry (VLBI) array for geodesy. This will consist of three new antennas to be situated at Hobart in Tasmania, at Yarragadee in Western Australia and at a site still to be determined in central northern Australia. VLBI data will be recorded at these sites and shipped to a dedicated correlation facility at Curtin University. The Data Analysis Centre at Geoscience Australia will use the VLBI data to explore the motion of the Australian continent and improve the International Geospatial Reference System (IGRS) as it applies to Australia. Construction of the array will take place from 2007 until 2009 with the first antenna to be constructed at Hobart beginning in 2008. Both construction and operation of the array will be the responsibility of the University of Tasmania (UTas).

Three new antennas will be required. The first will be installed at the Hobart site with construction and acceptance testing to be completed no later than 1 October 2008. The second antenna will be constructed at Yarragadee starting no earlier than 1 December 2008 with hand-over no later than 1 December 2009. The third antenna may be built in parallel with the second, with construction starting no earlier than 1 March 2009 and hand-over no later than 1 March 2010. *Tenderers are invited to quote for the supply of the Hobart antenna only.* Upon completion of construction and acceptance testing of this antenna, the University will enter into negotiations with the successful Tenderer for the supply of the remaining two antennas. However the University reserves the right to re-issue an RFT if the first antenna does not fully meet requirements.

B2 Statement of Requirements

The Tenderer is to supply an antenna with the following basic specification:

- (a) 12-m diameter, cassegrain optics with shaped primary and secondary reflectors.
- (b) An alt-az mount to provide all-sky coverage above an elevation limit of 5 degrees
- (c) Slew rates of at least 4.5 degrees/sec in azimuth, 1.25 degrees/sec in elevation
- (d) Diffraction limited performance at frequencies from 1.5 to 17 GHz
- (e) Material & construction method – open; and
- (f) Antenna lifetime: 20 years.

Details of the antenna specification are given below, and in the attached Excel document. Tenderers are required to respond to each of the items in the spreadsheet and submit the completed document as part of their submission.

Siting and Site Preparation

The site for the Hobart antenna is located within 500 m of the existing 26m antenna, on land owned by the University at 147°26'24" East, 42°48'12" South. The site for the Yarragadee antenna will be on farm land leased by Geoscience Australia at 115°20'36" East, 29°02'55" South. The location of the third site is still to be decided but will probably be in the Northern Territory.

Site preparations including construction of foundations and the supply of services for the antenna will be arranged by the University of Tasmania in consultation with the Tenderer. It is the Tenderer's responsibility to provide the University of Tasmania with all the relevant information and specifications to enable the construction of the necessary infrastructure for the antenna. This information must be supplied in accordance with a program agreed between the successful tenderer and the University of Tasmania. In the event that UTas constructs infrastructure, in accordance with the Tenderer's instructions and specifications, that proves to be inaccurate, it is the Tenderer's responsibility to rectify the problem.

Budget

The budget for the manufacture, delivery, installation and commissioning of the antenna, in Australian dollars, is \$600,000 to \$800,000 each.

Timeline

It is anticipated that the successful Tenderer will manufacture the antenna off-site, deliver it to the site, then re-assemble and commission it. The Hobart antenna must be operational and ready for hand-over to observatory staff on or before 1 October 2008. Tenderers must detail their commissioning procedure to achieve this date in their proposal. Note that the University of Tasmania will require access to the antenna before 1 October to do its own tests to determine the acceptability of the antenna performance. A 2-week window for this testing is to be programmed into the build to allow for fault rectification, adjustments, etc, to meet the milestone.

Construction at the Yarragadee and Northern Territory sites would start after 1 December 2008 and 1 March 2009 respectively with hand-over no later than 1 December 2009 and 1 March 2010 respectively. Tenderers are to provide an indicative project plan to outline how these dates will be met.

Antenna Frequency Coverage

The antenna is to be capable of operating across the frequency range of 1.5 to 17 GHz as a minimum. Tenderers may wish to quote for the option of upper frequency limits of 32 and 43 GHz. An upper limit of 32 GHz is the much preferred option provided the cost is not prohibitive.

Antenna Optics and Structure

The primary reflector of the antenna is to be 12-m in diameter. Tenderers may wish to quote on larger diameter antennas up to 20m. The optics are to be cassegrain with a shaped primary and secondary. Tenderers are invited to quote for optics suitable for both wide-band (2 – 17 GHz) and S/X-band (2.2 – 2.45 GHz and 8.1 – 8.9 GHz) collinear feeds, both cryogenically cooled and room-temperature. The opening angles of the feed may be such that a cone-like mounting structure is required, rising from the vertex of the antenna. In this event the cone is to be enclosed and suitable for housing the feed and receiver (possibly cryogenically cooled), up to a mass of 200 kg, in a thermally stabilised environment. It must be structurally rigid so as to not change the focus position as a function of elevation by more than 1 mm. Tenderers are to provide the option of modifying the cone (if necessary) to support wide-band or narrow-band S/X feeds.

The materials of the dish, mount and pedestal are open and must be specified by the Tenderer. Likewise the design is open.

Aperture Efficiency

The aperture efficiency is to be at least 75% at the highest frequency.

Feed

Tenderers are invited to quote for the supply of a feed for the antenna capable of making simultaneous observations in the frequency ranges 2.1 - 2.4 GHz and 8.1 - 8.9 GHz. The output signals are to be both hands of circular polarization at each frequency.

Feed Translator

While this RFT is concerned specifically with a single feed and receiver, it is hoped that in the future multiple bands will be supported, requiring a mechanism for automatically moving feeds to the focus position. Tenderers may also wish to quote as a separate item for the ability to retro-fit a feed translator so that the antenna could support multiple receivers at a future date.

Subreflector Positioning and Tracking

The subreflector is to be supported such that changes in ambient temperature do not cause a change in the focus position. Changes in the subreflector position with respect to the main reflector and feed due to gravitational deformation should be negligible for operation up to frequencies of at least 17 GHz. If the antenna is capable of operating above 17 GHz, Tenderers are requested to manufacture the subreflector such that the focus is adjustable to track any gravitational deformations in the primary reflector. It is important that subreflector positioning is repeatable to 0.5 mm accuracy or better. The hardware to provide automatic subreflector tracking is not required in this RFT but the costs to retro-fit it in the future is requested as a separate item.

Cable Wrap and Pedestal

A cable wrap mechanism is required to guide up to 20 cables, of standard coax size, from the receiver cone to the base of the pedestal. Eight of the cables will be optical fiber. Sufficient space for 8 optical transceivers in the cone and the pedestal should be provided, although the transceivers themselves are not requested here. The pedestal design and material are open; however the design must incorporate secure, water and air-tight enclosure to house both the power distribution board and an RFI-tight box for the control system. The enclosure is to be capable of being air-conditioned and easily accessible. Tenderers are to specify the available space inside the pedestal.

Antenna Surfaces

The dish surface is not expected to be load-bearing – i.e. no one will walk on it. The reflecting surface must have a finish to minimize the thermal loading at the focus when pointing near the sun: two coats of Hi-Reflectance White, manufactured by Triangle Paint Company Inc of 1930 Fairway Drive, San Leandro, California, or its equivalent, is recommended, resulting in a 50 micron dry film thickness, for metal reflector surfaces. In the case of a non-metal reflector, details of the proposed equivalent finish and performance must be provided in the Tender. The underside of the antenna surface is to be coated with a similar primer as the reflecting surface and finished with a suitable top coat (e.g. semi-gloss industrial grade white such as Croda Acidol HD). The final coating procedures will be submitted by the Tenderer for approval.

Antenna Mount

The antenna mount should be of an Altitude-Azimuth design with azimuth range of +/- 270 degrees from a neutral point to be specified. The elevation range should be from 5 to 90 degrees. Tenderers are invited to quote for the option of a 3 to 90 degree elevation range (which is preferable), as well as “over-the-top” options such as a 3 to 177 degree elevation range, possibly with reduced azimuth range.

Slewing and Tracking Requirements

The normal mode of operation of the AuScope antennas will be 180 x 24 hour observation sessions per year. Observations will involve slewing between targets for approximately 50% of the time at a rate of approximately 60 slews per hour. A slew may be up to 180 degrees and observations will be of 30 seconds or less. Slew rates should be at least 4.5 degrees/sec in azimuth and 1.25 degrees/sec in elevation. Preferable slew rates are 6 degrees/sec in azimuth and 2 degrees/sec in elevation. Tenderers are invited to quote for both the minimum and preferred slew rates as well as the option of upgrading the antenna from the slower to the faster rates. Tenderers are required to state the drive acceleration (in deg/s/s) in both axes which should be high enough to enable the required number of observations to be performed.

Operating Conditions

The antenna and its control system should be designed for a lifetime of 20 years, given normal operating conditions which are:

- (i) wind speed less than 70 km/hour;
- (ii) ambient temperature in the range -10 to +50 degrees C

The antenna must be capable of surviving wind gusts up to 150 km/hour when in safe stow mode. Full lightning protection must be provided for all components of the control and drive system.

Antenna Control and Monitor Interface

The antenna must be supplied with a system that allows precise tracking of astronomical objects and provides for safe operation of the antenna at all times, including components such as limit switches, emergency stop options, following errors and other servo errors. The interface must provide the ability to switch drives and brakes on or off and to control the drive speeds. The ability to be able to accurately specify and control the drives at low rates is important for good astronomical tracking. The control/drive system must be able to maintain a pointing accuracy of better than a factor of 0.1 times the FWHM of the primary beam at the highest frequency under all normal operating conditions. Output data to include status information on drives, brakes, drives rates, antenna position, drive error states, safety switch states and limit switch states. UTas has existing antenna control software which controls the antenna drive rates through analogue signals in the +/-10V range and TTL digital signals. Compatibility with this system is desirable, but not compulsory. The Tenderers are to specify the form of the input and output signals (e.g. TTL, analogue -10 -- 10 V etc) and the rate at which the input/output information is read/updated. Alternate antenna control procedures,

e.g. providing a list of times, azimuths and elevations via TCP/IP protocols, may be specified. However, the precise Interface Protocol Document will be agreed with the project team before construction begins

An operator panel providing basic controls from the pedestal, independent of the software systems, must also be provided. The entire control system must be housed in RFI-tight box(es) installed within the antenna pedestal.

Radio Frequency Interference

Over the frequency range of 1.5 to 17.0 GHz, the control system equipment enclosure needs to meet an Equivalent Isotropically Radiated Power (EIRP) emission level at a distance of 3 metres of no more than -122 dBm at 2.0 GHz, increasing to -100 dBm at 17 GHz, as illustrated in Figure 1. The contractor will be required to provide evidence that the complete enclosed control system has been tested under a certified compliance testing regime.

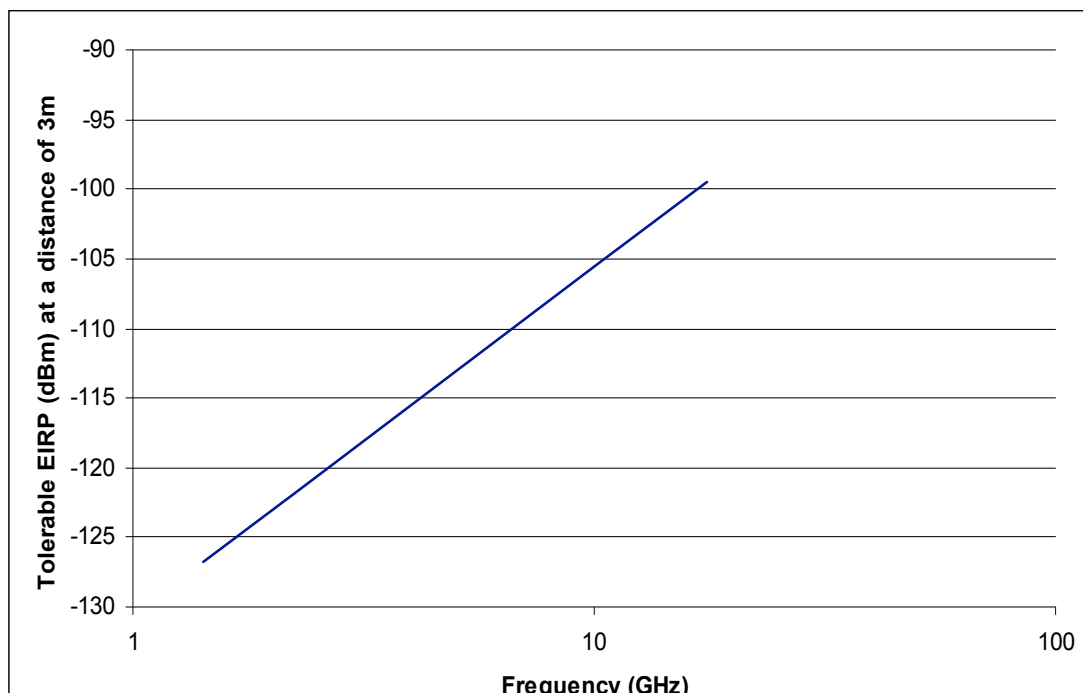


Figure 1: Maximum tolerable RFI from the control system.

Power

Tenderers are required to quote the total maximum power rating of the antenna and all of its systems. Power factor correction equipment is to be incorporated into the main power distribution board to maintain a power factor of 0.95 lagging or better at the incoming supply point for the expected load rating of the installation. Surge protection equipment must be incorporated into the main distribution board to protect the installation from over voltage events caused by e.g. lightning in the vicinity of the antenna.

Maintenance and Spares

The design lifetime for the antenna to be twenty (20) years. Tenderers are to detail an anticipated maintenance schedule and budget including:

- (i) The antenna motor running time between maintenance;
- (ii) Drive gear failure timescales;
- (iii) Expected durability of the antenna surface finish (i.e. time between repainting);
- (iv) Full documentation of the antenna as-built will form one of the deliverables of the contract.

Some of the antennas in the AuScope array will be at isolated locations with day-to-day operations conducted remotely from Hobart. A high level of reliability is therefore desirable and, in the event of a problem, it is important that the resources necessary to return to operation quickly are available. Given these operational requirements, Tenderers are required to provide a list of recommended spare equipment for the antenna as a separate budget item.

B3 FORM OF TENDER

Tenderers must provide their tender as:

- original hard copy;
- 2 copies; and
- 1 electronic copy compatible with the Microsoft® Word 2000 or PDF format.
- 1 electronic copy of the completed spreadsheet in Microsoft® Excel format.

B4 CONTENTS OF TENDER

The Tender *must* contain:

- (a) Cover Sheet completed and signed by the Tenderer or for and on behalf of the Tenderer by a person who warrants their authority to sign for the Tenderer;
- (b) Executive Summary;
- (c) Firm Information including financial viability
- (d) Staff resources who will deliver the services to the University including the person who will be primary contact with the University, other key personnel and their relevant experience.
- (e) A statement of fact as to previous experience and achievement in delivering comparable antennas, resources and ability to carry out the work or services specified for the duration of the contract.
- (f) Disclosure and management of conflicts of interest;
- (g) The cost in Australian dollars (AUD) of the antenna as described in the Statement of Requirements, including a breakdown by the various components and optional items described. In particular, the Tenderer must specify the following:
 - i. Aperture size and efficiency. The aperture to be 12m or more in diameter, and aperture efficiency be 75% or more over the frequency range 1.5 to 17 GHz;
 - ii. Sky coverage. Minimum requirements are 5 to 90 degrees in elevation and an azimuth range of +/- 270 deg from a neutral point to be specified;
 - iii. Drive speeds and pointing accuracy. Maximum slew rates to be at least 4.5 deg/s in azimuth and 1.25 deg/s in elevation, and pointing accuracy while

tracking celestial sources are to be at most 0.1 times the FWHM of the primary beam at the highest frequency;

- (h) The process and methodology to be employed in undertaking the tasks of delivery, assembly and commissioning of the antenna by 1 October 2008;
- (i) Details on how the equipment will be shipped and insured for transport to the Hobart site;
- (j) Details of University resources which may be required including site preparation work to be carried out by University staff prior to delivery;
- (k) Details on support staff and services to the equipment. Tenderers to supply an anticipated maintenance schedule and budget including: the antenna motor running time between maintenance, drive gear failure timescales and expected durability of the antenna surface finish;
- (l) Details on the warranty coverage of the equipment and extension options.

B5 ADDITIONAL MATERIAL

The Tender *may* contain

- (a) written references;
- (b) names of past or existing clients who the University may contact for a reference as to the Tenderer's ability to deliver the tendered equipment.
- (c) Further options for consideration by the University in line with section 17 of Part A of this RFT; or
- (d) any other information the Tenderer considers appropriate.

PART C
TENDER COVER SHEET
TENDER ID NO: PHYSICS 2007/001

DATE:

The Tender Box
ASSET MANAGEMENT SERVICES
University of Tasmania
Private Bag 35
HOBART TAS 7001

CLOSING TIME for submission of Tenders: 4pm AEST, Friday December 7, 2007

REQUEST FOR TENDER COVER SHEET

I/we submit this offer, by way of tender, to deliver the University's Requirements specified in the above-mentioned Request for Tender ("RFT") at the prices tendered and in accordance with the Contract in Part D of the RFT ("Contract"). This Tender comprises:

- (1) this Tender Cover Sheet;
- (2) [*Note to Tenderer*: List the documentation submitted to comply with the RFT].
- (3)

I/we declare that:

Compliance with the RFT

- (a) the Tenderer undertakes to participate in the RFT process in accordance with the RFT;
- (b) this Tender is compliant with all sections of the RFT (including the Contract) [except to the extent stated below];

<p><i>Notes to Tenderer</i>: If the Tender does not comply or fully comply with the Conditions of Tender, including the Contract, the Tenderer must include a statement specifying each condition or requirement with which the Tender does not comply or fully comply with and indicating, for each condition or requirement the reason(s) for the non-compliance.</p>

Acceptance

- (c) this Tender constitutes a complete offer relating to all matters required for the completion of the contract to deliver the University's Requirements and is capable of immediate acceptance by the University;
- (d) this Tender remains open for acceptance until [insert date];

<p><i>Notes to Tenderer</i>: Clause 18 of the Conditions of Tender provide that the Tender must remain valid and open to be accepted for a period of no less than 90 days from the Closing Time.</p>
--

Accuracy and Correctness of Tender

- (e) the information and particulars provided as part of this Tender are accurate and correct;

Conflict of Interest

- (f) to the best of our knowledge, information and belief neither the Tenderer or its employees or advisers have placed themselves in a position which may have given or did give rise to a conflict of interest or a potential conflict of interest between the interests of the Tenderer or its employees or advisers and the interests of the University in relation to this RFT process; and

Notes to Tenderer: If Tenderers are aware of a conflict of interest or potential conflict of interest they are obliged to notify the University in writing (see clause 16 of the Conditions of Tender).

Authorisation

- (g) I am/we are duly authorised to sign this Tender Cover Sheet for and on behalf of the Tenderer.

Signed by the Tenderer or

for and on behalf of the Tenderer by

.....

a person who by his/her signature duly warrants his/her authority to sign

Name of Tenderer:

Address of Tenderer:

(Include fax no. & telephone no.)

ABN of Tenderer:

PART D – FORM OF CONTRACT

The contract is a fixed price lump sum contract payable upon completion of the works and will be subject to the terms and conditions of AS 4910-2002 Australian Standard General Conditions of Contract for the Supply of Equipment with Installation, as stated in Annexures A & C below.

Contract documents will comprise:

The Agreement Execution pages;
Form of Tender submission and any correspondence during tender negotiations;
AS 4910-2002;
This Request for Tender, including an Excel spreadsheet detailing the University's requirements for the antenna that Tenderers are required to complete.

**ANNEXURE to the Australian Standard
General conditions of contract for the
supply of equipment with installation
AS 4910—2002**

Part A

This Annexure shall be completed and issued as part of the tender documents and, subject to any amendments to be incorporated into the *Contract*, is to be attached to the General Conditions and shall be read as part of the *Contract*.

Item

- | | | |
|---|--|--|
| 1 | <i>Purchaser</i>
(clause 1) | University of Tasmania
.....
ACN.....ABN 30 764 374 782 |
| 2 | <i>Purchaser's address</i> | Private Bag 35
Hobart, Tasmania, Australia 7001
Phone +61 3 6226 2686Fax +61 3 6226 7260 |
| 3 | <i>Contractor</i>
(clause 1) |
.....
ACN.....ABN |
| 4 | <i>Contractor's address</i> |
.....
Phone.....Fax..... |
| 5 | <i>Superintendent</i>
(clause 1) | University of Tasmania (the Purchaser).....
.....
ACN.....ABN |
| 6 | <i>Superintendent's
address</i> | As per item 2.....
..... |
| 7 | <i>Delivery place</i>
(clause 1 and subclause 34.1) | Mt. Pleasant Observatory
Denholms Road
Cambridge, Tasmania, Australia
..... |
-

† 8	a) <i>Date for delivery</i> (clause 1 and subclause 34.1)
	OR	
	b) Period of time for <i>delivery</i> (clause 1 and subclause 34.1)	1 June 2008 to 1 October 2008
† 9	(a) <i>Date for practical completion</i> (clause 1 and subclause 34.1))	1 October 2008
	OR	
	(b) Period of time for <i>practical completion</i> (clause 1 and subclause 34.1))
10	Governing law (clause 1(h))	Tasmania, Australia If nothing stated, that of the jurisdiction where the <i>site</i> is located
11	(a) Currency (clause 1(g))	AUD \$ If nothing stated, that of the jurisdiction where the <i>site</i> is located
	(b) Place for payments (clause 1(g))	University of Tasmania, Churchill Avenue, Hobart Tasmania by EFT If nothing stated, the <i>Purchaser's</i> address
	(c) Place of business of bank (clause 1(d)) If nothing stated, the place nearest to where the <i>site</i> is located
12	Quantities in <i>schedule of rates</i> , limits of accuracy (subclause 2.3(b))	Upper Limit – Not Applicable Lower Limit – Not Applicable
13	<i>Provisional sum</i> , percentage for profit and attendance (clause 3)	Not Applicable%
† 14	<i>Contractor's security</i>	
	(a) Form (clause 5)	Bank Guarantees in AUD \$
	(b) Amount or maximum percentage of <i>contract sum</i> (clause 5)	\$ OR Two at 2.5% of the gst exclusive <i>contract sum</i> If nothing stated, 5% of the <i>contract sum</i>

† If applicable, delete and instead complete equivalent *Item* in the *separable portions* section of the Annexure Part A.

- (c) If retention moneys, percentage of each *progress certificate* (clause 5 and subclause 37.2) Not Applicable.....%, until the limit in *Item 14(b)*
If nothing stated, 10%, until the limit in *Item 14(b)*
- (d) Time for provision (except for retention moneys) (clause 5) Prior to commencement
If nothing stated, 28 days
- (e) Additional *security* for unfixed plant and materials (subclauses 5.4 and 37.3) NIL.....
.....\$
- (f) *Contractor's security* upon *certificate of practical completion* is reduced by (subclause 5.4) 50% of amount held
If nothing stated, 50% of amount held

- † 15 *Purchaser's security* Not Applicable
 - (a) Form (clause 5)
 - (b) Amount or maximum percentage of *contract sum* (clause 5) Not Applicable.....
If nothing stated, nil
 - (c) Time for provision (clause 5) Not Applicable
If nothing stated, 28 days
 - (d) *Purchaser's security* upon *certificate of practical completion* is reduced by (subclause 5.4) Not Applicable
If nothing stated, 50% of amount held

16	<i>Purchaser-supplied documents</i> (subclause 8.2)	Document	No. of copies
		1 UTAS Request for Tender Document.....	1
		2
		3
		4
		5
			If nothing stated, 5 copies

- 17 Time for *Superintendent's direction* about documents (subclause 8.3) 14 days
If nothing stated, 14 days

† If applicable, delete and instead complete equivalent *Item* in the *separable portions* section of the Annexure Part A.

18 Subcontract *work* requiring approval (subclause 9.2) Not Applicable.....

19	Novation (subclause 9.4)	Subcontractor	Particular part of <i>WUC</i>
		Not Applicable.....
		<i>Selected subcontractor</i>	Particular part of <i>WUC</i>
		Not Applicable.....
	

20 *Legislative requirements*

(a) Those excepted (subclause 11.1) Not Applicable.....

(b) Identified *WUC* (subclause 11.2(a)(ii)) Not Applicable.....

21 Time for insurance of undelivered *Equipment* (subclause 16.1) 14 days after the *date of acceptance of tender*
 If nothing stated, 14 days

22 *Insurance of the Works* (other than undelivered *Equipment*) (subclause 16.2)

a) Alternative applying Alternative 2.....
 If nothing stated, Alternative 1 applies

If Alternative 1 applies

b) Provision for demolition and removal of debris Not Applicable.....
\$.....

OR

..... % of the *contract sum*

- c) Provision for consultants' fees Not Applicable.....
..... \$
- OR
..... % of the *contract sum*
- d) Value of materials or things to be supplied by the *Purchaser* Not Applicable.....
..... \$
- e) Additional amount or percentage Not Applicable.....
..... \$
- OR
..... % of (a) to (d) in subclause 16.2
- 23 Public liability insurance (clause 17)
(a) Alternative applying Alternative 2.....
If nothing stated, Alternative 1 applies
- If Alternative 1 applies
(b) Amount per occurrence shall be not less than Not Applicable.....
..... \$
- If nothing stated, then not less than the \$10 000 000
- 24 Time for giving possession of *site* (subclause 24.1) Date of Delivery
If nothing stated, the *date for delivery*
- 25 *Tests* (clause 30)
- | | <i>Tests</i> | <i>Times</i> |
|---|--------------|--------------------|
| 1. Pointing stability and repeatability | | Upon handover..... |
| 2 Drive speed and acceleration..... | | Upon handover..... |
| 3 Surface accuracy | | Upon handover..... |
| 4 Focus point stability | | Upon handover |
- 26 *Qualifying causes of delay*, causes of delay for which *EOTs* will not be granted (paragraph (b)(iii) of clause 1 and subclauses 34.3) The first three days of any industrial action in any calendar month up to and including the date for practical completion
.....
.....

- † 27 Liquidated damages (subclause 34.7)
- a) for *delivery*, rate
 \$NILper day
- (b) for *practical completion*, rate Per day, \$500.00 per day
- † 28 Bonus for early *practical completion* (subclause 34.8)
- (a) Rate \$NIL per day
- (b) Limit Not Applicable.....
 \$
 OR
 % of *contract sum*
 If nothing stated, there is no waiver
- † 29 Other *compensable causes* (paragraph (b) of clause 1) NIL.....

- 30 *Defects liability period* (clause 35) 12 months
 If nothing stated, 12 months
- 31 Progress claims (subclause 37.1)
- (a) Times for progress claims Not Applicable day of each month for *WUC*
 done to theday of that month
- OR
- (b) Stages of *WUC* for progress claims Staged payments as agreed with contractor.....

† If applicable, delete and instead complete equivalent *Item* in the *separable portions* section of the Annexure Part A.

32 Unfixed plant and materials for which payment claims may be made (subclause 37.3) Not Applicable.....
.....
.....

33 Interest rate on overdue payments (subclause 37.5) Official Bank Rate in Australia at the date the claim incurred (% per annum)
If nothing stated, 18% per annum

34 Time for Purchaser to rectify inadequate possession (subclause 39.7(a)(iii)) 14 days
If nothing stated, 14 days

35 Arbitration (subclause 42.3)

(a) Person to nominate an arbitrator The President of the Institute of Arbitrators & Mediators Australia .
.....
.....

A1 |

If no-one stated, the President of the Institute of Arbitrators & Mediators Australia

(b) Rules for arbitration
.....
.....
.....

If nothing stated:
(a) rules 5–18 of the Rules of The Institute of Arbitrators & Mediators Australia for the Conduct of Commercial Arbitrations;
OR
(b) if one or more of the parties are nationals of and habitually resident in, incorporated in, or where the central management and control is exercised in, different countries as between the parties, then the UNCITRAL Arbitration Rules shall apply and the appointing authority shall be the person provided in *Item 35(c)*

(c) Appointing Authority under UNCITRAL Arbitration Rules
If no-one stated, the President of the Institute of Arbitrators & Mediators Australia

A1 |

Deletions, amendments and additions

The following clauses have been added to those of AS 4910 – 2002

1. Clause 1: Interpretation and Construction of Contract:

“The Works”, add “this includes the provision of full “As Built” documentation of the Antenna, including Operation and Maintenance manuals at the date of practical completion”.