RADIO ASTRONOMY COMMITTEE (RAC) REPORT TO THE CASCA BOARD
May 2005 (Submitted by J. Irwin 29 April 2005)

1. Committee Membership:	Start Date	End Date
Judith Irwin (Queen's, Chair)	Jan, 2003	Jan, 2006
Peter Dewdney (HIA) (Past Chair)	Jan, 2003	Jan, 2006
James DiFrancesco (HIA)	Sept, 2003	Sept, 2006
Ingrid Stairs (UBC)	Sept, 2003	Sept, 2006
Ken Tapping (HIA) (spectrum management)	continuing	
Gary Welch (St. Mary's)	Sept, 2003	Sept, 2006

It is clear that a new membership drive should begin soon. One or two new members should be recruited to begin Fall, 2005 so that there is sufficient overlap prior to 2006 for continuity. [For a current list of members, consult the CASCA web site.]

2. Frequency of Meetings:

To date, the committee has been meeting via telecon twice per year with email communications, as required, in between. Currently, however, we are discussing the possibility of more frequent telecons as there are a number of important issues, as this report attests. Most of the members of the RAC will attend CASCA Montreal and an informal meeting is also intended to be held at that time.

3. Getting information to the Canadian community:

a) Cassiopeia:
An article for Cassiopeia by the RAC is long overdue and we intend to submit one for the next deadline which is JUNE 15, 2005. Some of the issues to be included are noted at various points in this report.

b) Website:
The RAC website has now been transferred to Irwin's local area at Queen's rather than the CASCA area at Queen's. This will allow for more frequent and easier updates, as required. The existence of this site will be advertised in the Cassiopeia article.

4. Spectrum Management (see also ADDENDUM at the end of this report):

There continue to be important issues regarding spectrum management that plague the radio astronomy (and now IR) community. The concept of 'radio quiet zones' is being vetoed by the Americans and this is unfortunate. The most effective way to deal with interference at present seems to be on a local basis. For example, there is good cooperation with the community around DRAO to keep that area radio quiet. Internationally, however, the situation is more difficult and very political. Those who operate satellites do not want to turn them off for any length of time. Canada should continue to submit proposals to represent the interests of Canadian radio astronomers, however, as the situation is likely to worsen without this continued presence. Two issues are of immediate importance:

a) The RAC is quite concerned about continuity in the area of spectrum management. Ken Tapping has handled this for many years and it is extremely important to identify another individual who can work with Ken over the next 5 years. The RAC feels that this individual should be from HIA to ensure the kind of continuity that is needed. A more complete justification of this is included in the Addendum at the end of this report.

ACTION ON BOARD
The RAC requests that the board approach HIA, asking HIA to name another individual who can work with Ken Tapping over the next few years on spectrum management issues prior to Ken's retirement.

b) There are now interference threats at higher frequency and certainly extending into the IR. Some years ago, Paul Feldman called for input from the community to identify the parts of the spectrum that most needed protecting up to 900 MHz. We now need to repeat this exercise as well as push right up to 3000 GHz. A call for this information will be put into the Cassiopeia article.

5. The RAC looks forward to hearing more about the status of the LRP initiatives at the upcoming CASCA meeting. Support for Canada's interest in major radio astronomy facilities (e.g., SKA) is a major concern. Post-doctoral support is also of concern to this committee.

6. The RAC is pleased to see the success of our initiative regarding the upcoming JCMT session at CASCA Montreal. We will be writing a letter of thanks to Rene Plume for his efforts after the meeting.

7. JCMT:

The JCMT continues to be in demand and Canadian proposals were up by 10% over last semester. There continue to be ongoing problems with SCUBA and it is currently warmed up. The CTAG will meet in early May and there will be an emphasis on good quality heterodyne projects.

ACSIS was delivered in Dec/04 and installed in Feb/05. Some work is required and engineering time is built into the schedule. The HARP front end (from UK) is on-track and delivery is expected this summer.

The good news is that SCUBA 2 is now fully funded and there appear to be no serious technical problems. A few glitches have been identified but no show stoppers. The latest delivery time estimates are for about a year from now, though possible slippage of the date might occur.

Later this year, a demonstration of the link between the JCMT and the SMA is expected. It is not yet known what this will do to the schedule.

Before the end of the year, there will be a strategic review of the telescope, in anticipation of the upcoming end of the current tripartite agreement (2009). The RAC will offer its support, if needed, to the Director, JCMT, in this endeavour.

Seven 'Legacy Surveys' have now been submitted to the JCMT. The amount of time to be devoted to surveys has yet to be decided by numbers of order 50% have been suggested informally. These proposals are being sent to a panel of outside reviewers for ranking and will be discussed at the May JCMT board meeting. It should be stressed that the legacy project process is meant to be very open and there is still time to become involved if anyone so wishes. This information will be put into the Cassiopeia article.

8. ALMA:

ALMA is progressing and a plan for its operation has now been submitted. Some progress has also been made on software and on receiver development. One delay has been related to the antennas. It would appear that the cost is higher than originally anticipated. ALMA is going through a funding "rebaselining" exercise at the present time. There will be several ALMA related posters at the upcoming CASCA meeting, organized by Christine Wilson.

9. NSERC Grants and the LRP:

The committee has discussed an issue related to the structure and availability of NSERC grants with respect to the LRP. This issue is clearly of concern to radio astronomy projects in Canada, but since it has more far-reaching consequences, it was thought that it is an issue that the Board should take up. The problem is that there are *no* NSERC grants to which we can apply for funding projects that have been highly ranked in the LRP. An example is the continuation and completion of the CGPS/IGPS. Another example which is quite worrying is the funding of Canada's SKA activity. NSERC has simply not structured its grants in such a way that it is 'in-synch' with Canada's astronomy community and the goals of the LRP.

ACTION ON BOARD
The RAC requests that the Board begin a dialogue with NSERC to address the issue of the lack of grants that could enable the Canadian astronomical community to achieve its LRP goals.

10. SKA/LAR:

The LAR 5 year development plan has been accepted by the LRP. Presently, HIA has one year's funding remaining for the project and nothing (yet) after that. No new money was specifically allocated to the LRP in the federal budget. There also seem to be potential snags in US funding. On the technical development side, more emphasis is now being placed on development of phased arrays than has been previously.

The Canadian SKA endeavor has now been completely reorganized. The project is represented by the 'Canadian SKA Consortium' that has representation by CASCA, ACURA, HIA, and industry. ACURA has taken on the Canadian SKA project and with it, the responsibility to obtain funding of order 50K Euros/yr to support the international office. A Memorandum of Understanding has now been signed to ensure Canada's place in the international SKA project. Russ Taylor will be chair of the board of this consortium. The former SKA Steering Committee, now called the Canadian Ska Science Advisory Committee (CSSAC), will continue to be a subcommittee of CASCA. Since Russ, who was acting Chair of the former Steering Committee is now taking over the chairmanship of the board, the RAC has been active in identifying a new Chair for the CSSAC. Norbert Bartel has agreed to take on this position. In addition, Vicky Kaspi has agreed to be the CASCA rep on the Canadian SKAConsortium board.

ACTION ON BOARD
The RAC requests that the CASCA board endorse the appointment of Vicky Kaspi to the Canadian SKA Consortium board.

ACTION ON BOARD
The RAC requests that the CASCA board endorse the appointment of Norbert Bartel as Chair of the CSSAC.

The RAC anticipates that the international SKA Working Group (SWG) will be asking Ue-Li Pen to become a new member. We note that Chris Blake, who is currently at UBC, is also a member of the SWG. In addition, the CSSAC is in the process of renewing its current membership. These names will be forwarded to the board for endorsement via email, as soon as possible.

There will be a CSSAC presentation and short meeting at CASCA-05.

11. EVLA:

The EVLA has not been specifically introduced as an agenda item for the RAC in the past, but should be now. Canada is investing $20 M into the project and there should be a substantial (100 X) improvement in sensitivity of the VLA as a result. The correlator is expected to be on the telescope in 2009. This project needs more publicity, especially since Canadians should become aware of a substantially improved capability that they can tap into. Over the next few years, Canadians might consider science projects that could best utilize this instrument. This information can be put in the Cassiopeia article.

ADDENDUM: SPECTRUM MANAGEMENT

In a radio spectrum where the number and nature of radio services is growing rapidly and we need to protect our long-term investment in new instruments, and also to make our claims for allocations in new areas of the spectrum, we need to maintain a continuous and consistent effort in spectrum management. Ken Tapping has been doing this since 1997 and won't be doing it forever, so it is timely to find a person who will work with Ken and take on the full responsibility when Ken decides to drop the baton. Since this work needs someone who is technically and scientifically up to speed, and also someone who is prepared to make a substantial time investment, it would be appropriate

for the CASCA Board to guide a community decision in this area so that an appropriate and recognized commitment can be made either by the HIA or a Canadian university. The increasing importance of millimeter and submillimeter radio astronomy indicates that someone with a special interest in this area of the spectrum would be appropriate.

This work involves working actively with Industry Canada in developing Canadian positions and then attending international meetings, mainly in Geneva as a member of the Canadian Delegation in promoting these positions. An important part of this work is in enhancing the general knowledge of and support for Canadian radio astronomy among our spectrum managers. They are as committed to Canada as anyone else is, but need to be kept informed about what is going on and what they can do to wave the flag. They seem genuinely eager to do this.

This is not a one-year thing. I was told that it takes about 5 years to get up to speed with this mixture of science, engineering, skulduggery and larceny, and from experience, I think that is about right. This is a long-term investment. Other countries are prepared to make that sort of commitment, so should we be. An appreciation of "Yes Minister" is a definite asset.

The HIA is the obvious place for this person to be. However, since the work involves up to half a person's time, this commitment is probably not going to happen unless the community wants it.

Current Issues Include:

* Band-by-band study into the compatibility of other radio services with radio astronomy bands.

* Allocation of frequencies between 275 and 3000 GHz.

* Compatibility of radio astronomy (and other services) with the widespread, unlicensed deployment of ultra-wideband devices.

* Compatibility of radio astronomy with the use of electrical power lines for data communications.

New Frequencies to 3000 GHz

The International Telecommunications Union is now conducting studies regarding the allocation of the radio spectrum at frequencies to 3000 GHz. With the high value of such frequencies for continuum and spectral observations, we should ensure we make our claims. Canadian astronomers with scientific interest in particular frequency ranges between 275 and 3000 GHz are invited to send their suggestions to the CASCA Radio Astronomy Committee or to Ken Tapping directly, together with some words of justification. We did surprisingly well with the reallocation of spectrum between 71 and 275 GHz. We were lucky there. Other spectrum users triggered the discussion with their proposals less well developed than ours. They will not be caught that way again. We will make progress if we can make reasoned, defensible requests. The output will be a prioritized list that can be input to the discussions in Geneva.