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AUSTRALIAN SPACE SOCIETIES: THEIR ROLE IN SPACE EDUCATION

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ABSTRACT

The paper provides an overview of space awareness societies in Australia and presents a possible explanation for the absence of an effective national space awareness society. Using commercial marketing techniques, the author defines and analyses the market place for space awareness and education followed by a range of suggestions for space education products that could be released in that market. This will be followed by a critical evaluation of the role Australian space societies currently play in space education, as well as what restrictions and limitations they face. In conclusion the presentation will explore what can be done to improve the level of space awareness and education in Australia, including a review of the experiences in other countries.

INTRODUCTION

Like so many facets of Australian society, the presence and activities of space awareness societies in Australia is heavily influenced by the geographical and demographic conditions of the country. Although comprising six federated states and two territories, the country is a loose conglomeration of very parochial and territorial pockets of habitation with 62.78 percent of the 17.9 million population living in the eight capital cities (ABS, 1997). This distribution of the population results not only in little coherence, but also a strong rivalry between the states and territories.

It is this lack of coherence that has prevented the establishment of an effective single space awareness society, such as, for instance, the British Interplanetary Society in the United Kingdom. Over time attempts have been made to establish such a national society, as well as federations of local space societies, informal forums, pressure groups and the like. All of these failed either on inception or shortly afterwards. In a similar way, attempts to establish a national and commercial space journal have failed.

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THE SPACE SOCIETIES

As far as the author can determine, Australia is currently served by seven space societies. However, the possibility that other such societies operate unnoticed at a local level, cannot be discounted. In Western Australia, the Astronautical Society of Western Australia (ASWA) is now in its twenty-fifth year of providing a service to Western Australian based enthusiasts. It is the longest running space society in this country. In Victoria, the Space Association of Australia (SAA), in spite of its name, principally serves Melbourne. In Sydney, the Sydney Space Association (SSA) operates effectively through its association with the Powerhouse Museum, whilst there is also the Sydney Space Frontier Society (SSF).

The Australian Space Education Association (ASEA) has its home in Queensland. Its principal mission is the publication of a regular newsletter entitled Alsep Compac. The Australian Space Research Institute (ASRI) in Adelaide, formerly known as Australian Space Engineering Research Association (ASERA), is a very specialised group operating at a professional level to develop an amateur satellite designated as VKSat. This group is also involved in the development of a very light launch vehicle under the designation Ausroc as well as some educational activities which will be referred to below.

The National Space Society of Australia (NSS) was established in 1989. It is affiliated with the U.S.-based National Space Society. Public domain information states that the NSS is a national organisation with chapters in Sydney, Adelaide, Canberra, Melbourne, Newcastle, Perth, Queensland and Western Sydney. In reality, it seems that this is an overstatement: other published information has indicated that the chapters in Adelaide, Melbourne and Queensland are struggling whilst Canberra, Perth and Western Sydney are dormant (SFN, 1997). This, effectively, leaves only Sydney and Newcastle as active and puts some doubt on the national claim. Finally, reference must be made to the CSIRO Office of Space Science and Applications (COSSA) and the Cooperative Research Centre for Satellite Systems (CRCSS), which, in the absence of a national space agency, play a limited role in space awareness.

Like all organisations, these societies have missions or objectives. Usually these say something like ‘stimulating a national space programme’ and ‘increasing awareness’. The involvement of the space societies in space awareness and education stems not only from an emotional perspective, that would like to see every Australian have a deep interest in space, but is also a matter of survival. Any society needs new members as old ones continue to drop off. The only way to gain new members is through active promotion.

Based on personal experience, the membership of these societies is principally comprised of enthusiasts with the occasional presence of members who have a professional status. The obvious exception is, of course, ASRI. Also from personal experience, it is evident that all these societies rely extremely heavily on the resources of one or more dedicated members. These individuals are the

keys to the survival of these societies and once they leave, the society concerned may very well cease to exist unless another dedicated person picks up the lead.

THE MARKET

In analysing the role of these local space societies in the space awareness effort we can make use of the same marketing techniques that expose consumers to many new products. A first step in marketing is to identify, or segment, the market and determine the specific characteristics of each market segment. The market segments are shown in Figure 1. Of course there is an overlap among these market segments.

Figure 1
Market Segments for Space Awareness and Education

- **Students**
  - » primary school students
  - » secondary school students
  - » tertiary students in disciplines unrelated to space
  - » tertiary students in space related disciplines
- **Adults**
  - » adults who are affiliated with a space society
  - » adults who are affiliated with 'fringe' space societies (such as an astronomical society)
  - » adults who are sufficiently interested to become affiliated with a space organisation but have not yet become aware that such a society exists in their community
  - » the general public
- **Specialists**
  - » teachers
  - » politicians
  - » the media
  - » industrialists
  - » space scientists and engineers

THE PRODUCTS

The products that can be released on these potential market segments can be classified as in Figure 2. In practice, several of these products will be used in combination to get the most effective product mix optimised for a specific market segment. Some of these products or product mixes are further described below, as well as the extent they are used in the Australian context.

Figure 2
Classification of Space Awareness Products

- **Written communications**
  - » newsletters and journals
  - » project materials for students
  - » incidental articles in journals
  - » information materials for specialists
- **Verbal communications**
  - » lectures to a selected audience
  - » lectures to the general public
- **Visual**
  - » photos and diagrams
  - » movies and videos
  - » static displays
  - » hands-on displays
  - » an astronaut

Lectures, Congresses, etc.

An effective lecture requires a combination of a suitable venue (such as a lecture theatre) and a sufficiently promotable speaker. The effectiveness of lectures can be augmented by means of visuals such as movies and static displays.

Large-scale meetings, such as congresses, have a limited capacity as a space awareness product. They are usually directed to a very selected public (specialists) and, because of the high costs involved in running such an event, are often priced at such a level that the non-specialists will not be attracted.

Until the mid-eighties, the Astronautical Society of Western Australia successfully conducted monthly meetings. The loss of a suitable venue through increased security arrangements, as well as difficulty attracting speakers, saw a demise in these meeting. The Sydney Space Association, through its affiliation with the Powerhouse Museum, holds regular meetings but, in spite of an excellent venue, that Society seems to struggle with attracting quality speakers.

The National Space Society of Australia continues to organise the Australian Space Development Conference (the fifth was held in July 1998). In spite of the high effectiveness of this conference in the specialist's market segment, the high registration fee reduced much of its effectiveness as a general space awareness product. The same applies to the 49th International Astronautical Congress held in Melbourne in September 1998.

Newsletters

Newsletters provide a very effective means of communication. Ideally they should contain a mixture of current information and historical information and

should attempt to provide such information on a global basis, rather than concentrate on, for instance, Australian space activities only.

In Australia the Astronautical Society of Western Australia has issued 25 years of its News Bulletin and succeeded to build this up as a well-respected communications medium. The use of simple reproduction techniques has ensured that the production costs—and hence the membership or subscription fee—has remained at a level acceptable to space enthusiasts.

The Brisbane based Australian Space Education Association issues its regular Alsep Compac whilst the Sydney Space Association publishes a very irregular newsletter. In addition, the Cooperative Research Centre for Satellite Systems (CRCSS) published a high quality newsletter which is, however, largely restricted to news relating to the CRCSS.

School project material

Provided that the demand is there through the educational programme, school project materials can be a combination of written word and still pictures. Currently the demand is very ad hoc but can be satisfied through existing resources.

Displays

Displays in generally accessible areas are an excellent means of reaching the general public. Space awareness societies are usually limited to small and temporary displays in banks or shopping centres. Large temporary exhibitions, such as the one planned for the International Astronautical Congress in Melbourne, are extremely effective for space awareness purposes, provided that they are accessible to the general public. In Australia, permanent space displays are in the Powerhouse Museum in Sydney and at the Tidbindilla Tracking station in Canberra.

Space Camps

The United States has several space camps which cater to students and adults, whilst in Europe there is a space camp site in Redu in Belgium. Australia does not have a space camp.

Astronaut

The best way to promote space awareness is by having an astronaut make guest appearances. Australia does not have an astronaut. Recently the media portrayed Andrew Thomas as an Australian astronaut; in fact, he is a U.S. astronaut who just happened to have been born in Australia. His availability to Australia will always be courtesy of NASA. Having a real Australian astronaut, sponsored by the Australian government, with an Australian flag on the sleeve, will have a significant impact on space awareness in Australia. And whilst it is not cheap to train an astronaut, it would be money well invested.

THE SELLING EFFORT

It must be noted that, like many products thrust upon the consumer, the total market is not crying out for space awareness products. Thus, only a small sector of the total market has an identified need for the products. The larger part has no need for these products and the bulk of the space awareness effort is a matter of convincing the consumer that the space effort is really the best thing that could ever happen.

Primary school students

This is a difficult market segment as the students at this level are often not advanced enough in the basic scientific and engineering concepts to understand the technical aspects involved in the space business. As such, the effort should concentrate on saturating their minds with visual images which are latently stored in the brain and can be retrieved some years later when they are secondary students. Pretty pictures, both still and moving, should provide the fertile soil which can germinate the seed. Of course a display, especially a hands-on display, will make a more intense impact.

Secondary school students

The secondary school student market segment is one of the easiest to satisfy. At that age students have not only the desire to find out about new things, but they have also a sufficient knowledge of science and engineering concepts to understand the technology of space exploration and exploitation.

Some of the products for this market segment are written information on space, in the form of articles in newspapers and pamphlets. Included in this written word should also be material that will assist students in their school projects. Where at all possible, these products must be enhanced by pictures and diagrams. Of course, moving pictures are even better: nothing is more impressive, and effective, as seeing an IMAX movie on space. Finally displays are an effective means to reach this market segment, especially hands-on displays.

In this market segment it is, however, essential to generate the demand. Teachers must be induced to make space a topic of the educational programme!

Adults Who Are Affiliated With a Space Society or Fringe Space Societies

Most of the products that are suitable for the secondary school students, are also very effective to satisfy the needs of the affiliated adult market segment and the fringe affiliated adult market segment. To this should be added specialised newsletters.

General Public

The general public comprises the largest and potentially least interested, market segment. This is the market segment that happily accepts the non-stick

frying pan, the satellite weather pictures and the direct television broadcasts of the Olympic Games, without realising that all those things would not have been possible if it had not been for the space effort.

Nevertheless, one should never forget that this is the ultimate lobby group - sufficient understanding in this market segment will drive politicians to approve a space programme, will motivate industrialists to set up space industries to market space related products, and will allow scientists to continue to undertake space research.

The principal means of passing the message on are public displays, either at large specialised exhibitions, such as an annual hobby or science fair, or through displays at banks, shopping centres and the like.

Where accessible, serious consideration ought to be given to public radio and television in the form of regular programmes, as well as incidental articles in journals and local papers. Especially television must be considered as the ultimate medium.

Finally, public lectures, preferably by an astronaut, will attract interest.

Adults Who Are Sufficiently Interested to Become Affiliated

Products used to make the general public aware of the space effort, will allow participants of this particular market segment to become aware that a space society exists in their community. Hopefully they will be induced to graduate towards space society membership.

Tertiary Students in Disciplines Unrelated to Space

The same products that can be used in the general public market segment, will attract tertiary students in disciplines unrelated to space.

Teachers

Teachers require versions of the products which optimise their needs. They are constantly looking for new topics to present to their students. The effort in this market sector must concentrate on seeding their minds. The various ways to do this include articles in teacher's journals as well as talking to teachers.

Other Specialists

Like teachers, the other specialists require optimised versions of the products which satisfy their particular objectives. The industrialist wants a higher profit. The politician will accept anything as long as it translates ultimately into more votes. The media must be fed appropriate press releases whenever something exciting happens in space.

Space Practitioners

Two market segments can be ignored by space awareness societies. One group includes tertiary students who have already chosen a space-related disci-

pline (hopefully as a result of the space awareness products that they were exposed to as secondary students). The second group includes space scientists and engineers who are already involved in space related activities on a professional basis. These people are more interested in scientific and engineering information, and professional study grants. Such requirements should be met through professional institutions and libraries of tertiary institutions and not by the awareness products offered by space societies. Of course there is nothing to stop these people from being a member of a space society and their participation would be appreciated.

SOME SPECIFIC SPACE AWARENESS PROJECTS

It is useful to look at some specific space awareness projects that are being undertaken not just in Australia but also elsewhere in the world.

In Australia, the Royal Australian Air Force donated 800 obsolete rockets to the Australian Space Research Institute (ASRI) in 1997. The rockets are of the Sighter and the Zuni type and were destined for the 20 Royal Australian Navy's A-4 Skyhawk strike aircraft that were withdrawn from service in the 1980s.

The ASRI now intends to requests Australian schools to design payloads that can be launched with the rockets. The plan is to conduct approximately 20 launches per year, using facilities at Woomera. Information kits will be distributed to schools in due course. The launches will be conducted by qualified ASRI personnel who will also assess the suitability of the payloads. The Sighters have a length of 140 cm and have a diameter of 8 cm, whilst the Zunis are 195 cm long and have a diameter of 18 cm. Both rockets can reach an altitude of 10 km. The first launch took place on 5 October 1997.

To augment NASA's excellent educational efforts, the U.S. space industry is actively working on space awareness. TRW's effort places an emphasis on education from kindergarten through eighth grade and involves TRW employees working with, for instance, day-care providers in shaping a suitable programme. The Lockheed Missile and Space Company recently paid for fifty U.S. teachers to attend a space camp in Huntsville , Alabama. In addition they sponsor students for the space camp. McDonnell-Douglas engineers work with high school students to control, via virtual reality and telepresence technology, a planetary rover that is being tested whilst Aerojet provides students with the opportunity to operate a mock mission control centre.

In France the space agency CNES has adopted a philosophy that attempts to bridge the gap between school education and the high sphere of space science. This programme actively sponsors amateur rocket development. It also provides SPOT images for processing in classrooms as well as flying balloons with experiments developed at schools.

The Rocky Mountains Chapter of the American Astronautical Society has given grants to schools in Colorado to foster an interest in space. It is sponsored by the large space industries in Colorado as well as some local small businesses.

For instance, one primary school concentrated on the Mars Pathfinder mission. The students built models, held art and writing competitions, and even simulated the landing on Mars by dropping one of the models using balloons as airbags. Many more examples are available, but the above serve to demonstrate the possibilities.

Lessons can also be learned from other industries. In Western Australia, the Petroleum Club undertakes an effective awareness programme. The programme is funded by the petroleum industry in this state and it employs a part time teacher who has developed an educational package that includes representatives of the industry talking to students in a show-and-tell situation. The package also provides teachers with ideas for projects.

Of course the petroleum industry in this state is somewhat more developed than the space industry but there are sufficient space operators in this state to fund a similar scheme and promote their little niche of the space industry to the schools. Such a promotion must be considered a long-term investment in goodwill. All that is needed is a dedicated educator (perhaps a retired teacher?) and a willing space industry.

AUSTRALIAN SCORE CARD

Whilst there is little doubt that the Australian space societies have a high level of enthusiasm and dedication in the space awareness effort, they are not in a position to effectively execute the role they have.

Most of the societies rely extremely heavily on the resources of one or more dedicated people. These people are the key to the survival of these societies and, once they leave, the society concerned may very well cease to exist unless some other dedicated person takes on the lead.

In addition, the societies lack:

- Human resources—simply people who are prepared to undertake the tasks that need to be done, such as attending a display;
- Materials—for example, recently the Astronautical Society of Western Australia wanted to organise a small travelling display but had to abandon the idea because it was impossible to obtain display materials;
- Financial resources—for example, with reference to the travelling display referred to above, there were no funds to buy display boards;
- Exposure and networks—this shortcoming was clearly demonstrated when recently Alexi Leonov, the supreme Russian cosmonaut, was in Perth and the Astronautical Society did not know about it;
- Presence of a national space awareness programme— whilst the Cooperative Research Centre for Satellite Systems (CRCSS) undertakes effective programmes for the very specialised market, it does not provide general space awareness facilities;

- Existence of a national space agency—Australia does not have a national space agency; and
- Effective liaison with educational institutions.

CONCLUSION

It is has been suggested that, if Australia, as a nation, is to look towards a future in space, a high degree of public awareness of the benefits that can be derived from space is essential. It is also evident that such an awareness is not there.

Space societies can provide a major contribution towards increasing space awareness. However, they cannot do this alone and in isolation. They must be allowed to operate within a framework that also involves industry and the government.

The means to achieve this would be by establishing a permanent space awareness forum that is composed of representatives of the national space agency, educators, industry and the space awareness societies. This forum, which should be funded by the national space agency, with assistance from the industry, should, on an on-going basis, aim towards increasing the level of space awareness in Australia.

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