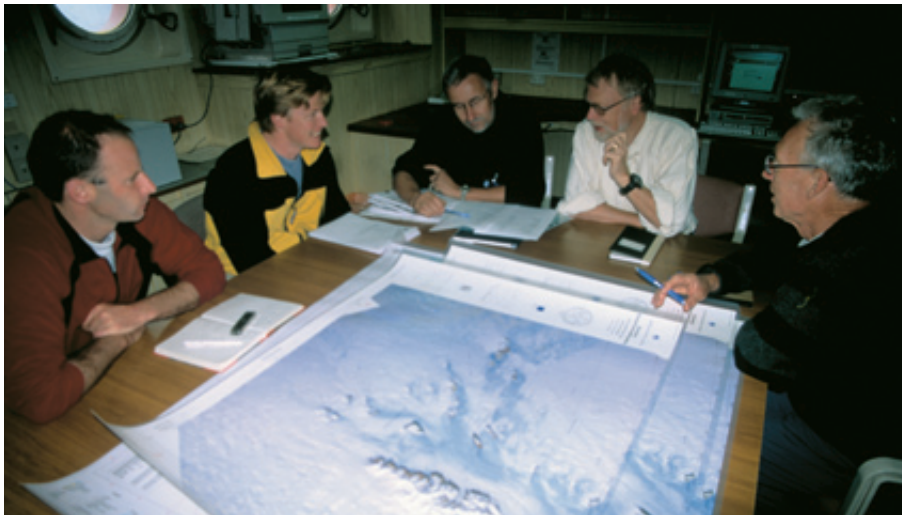
PCMEGA: an ambitious operation

The Prince Charles Mountains Expedition of Germany and Australia was one of the most operationally challenging undertakings of the AAD in recent years. The intention to take Australian and German scientists far into the Southern Prince Charles Mountains (SPCM) to achieve an ambitious science program posed many challenges to the operational support staff.

Over 12 months before the first scientist set foot on Antarctica, equipment had to be dispatched by ship. Predicting what may be needed was met head on with field support staff and the project planning team at Kingston collecting and purchasing gear that was subsequently shipped to Mawson on Voyage 6 in January 2002. This included tents, mountaineering equipment, rations and those small yet essential items such as toilet paper and sewing needles, all of which had to be delivered into the field on the traverse.

Two traverses from Mawson were mounted as part of PCMEGA, one in autumn 2002 and one in spring 2002 (See *Australian Antarctic Magazine* 4:37). The support from the station was invaluable in preparing the vehicles, cargo and personnel for the long haul to establish an expedition base camp at Mt Cresswell over 500 kms south of Mawson.

Another of the challenges faced by the support staff was that of determining the requirements of the science program. With people coming from all around Australia, Germany, the United States and Russia there was little lead time with everyone together to make any last minute changes. Detailed planning by the project team and support staff involved visits to Melbourne University and Hanover, emails and many phone calls. Still, no plan survives long after the lines are cast off in Hobart, and the result was a very busy pace of meetings, talks and planning on the *Aurora Australis* as the expedition steamed south.



GARY KUEHN

Plans become closer to reality as the ship nears Davis and deployment of the expedition.

Support in the field was provided by two helicopters which embarked from Hobart, and a Twin Otter aircraft from Calgary in Canada. It was determined that scientists and field training officers were to be deployed to three locations as soon as possible after arrival at Davis. This information was conveyed via email to the Twin Otter crew and the traverse team, the latter by now established in a base camp at Mt Cresswell. The usefulness of the Twin Otter aircraft soon became apparent as within a week of our request, the aircraft supported by the traverse team had positioned caches at the Rofe Glacier, Mt Stinear and Wilson Bluff on unprepared ground. Vital camp stores were deposited and at Wilson Bluff drums of fuel were deployed for the coming aerial geophysics survey.

After arriving at Davis on the evening of 5 December the pace quickly increased. The next morning the first Twin Otter flight departed for the SPCMs at 0800 and by the end of the day two flights had been completed. We were indeed thrilled to have established a magnetic base station for the geophysicists and to have the first geologists in a field camp at Mt Stinear by the end of day one. The fly-in continued over the next ten days with geologists and geodesists flying in to base camps and field camps to start work.

Aviation fuel was undoubtedly the most precious resource. The fly-in had been carefully orchestrated to use fuel at Sansom Island, cached earlier by Twin Otter, and from Davis, rather than the precious 480 drums that had been traversed in. The Twin Otter was now sent back to Davis to be fitted with geophysics equipment to allow the collection of magnetic, gravity and ice radar data over the next four weeks. It was a race against time for the team as the sea ice at Davis, and as a result the skiway, was fast breaking up. After a few test flights and with 50 knot winds forecast the aircraft departed Davis just prior to midnight on 19 December. The expedition was now fully deployed.

The geologists and surveyors had been busy since their arrival, travelling daily by foot, quad and helicopter to a range of areas. Rock samples were collected and survey marks established. The field training officers were kept busy managing the camps, ensuring safety and facilitating access to the required areas.

Traverse vehicles – fuel sledges, living van, generator van and tractors – at rest for the night while en route to Mt Cresswell.

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The traverse team, medical officer and field leader were also called on to assist scientists in the field and to maintain the base camp. A major undertaking was the provision of meals at Mt Cresswell for up to 20 people which fell to two of the traverse mechanics, and a fine feed it was! Communication was the lifeline for coordination and safety and the dedicated communications operator was always busy talking to the three aircraft and the field parties, while also doing three hourly weather observations!

Helicopter flying was planned about five days in advance with nightly updates as the wishes of the field parties changed with weather and what they were finding on the ground. Each day's flying had to be well planned to achieve the maximum as the fuel reserves were monitored carefully. By the end of the season the expedition had occupied 22 different field camps and established survey marks at 23 locations. We had travelled as far south as Komsomolskiy Peak, the most southerly rock in the AAT at 75° 30'S, and covered the SPCMs in detail. This was all achieved with excellent helicopter support and local light vehicle and foot travel.

The geophysics survey operated out of Mt Cresswell for a month. Flights were operated between 1400 and 0200 local time to avoid magnetic disturbance in the area. After long hours collecting data from the air, the team commenced collating and processing back at Mt Cresswell before crawling into tents for some well earned sleep. The split routines of the field parties and geophysics team provided a number of challenges for support staff and aircraft crew that were overcome by flexibility and a good deal of hard work. Over the four weeks of the survey the team achieved an excellent result with 30,000 km flown in the survey area covering some 80,875 km^2. An additional 20,000 km was flown and surveyed en route to the survey area. Each flight was planned to cover maximum ground while best utilising fuel reserves.

The SPCMs are not only an area of rich scientific potential but are also of historical interest. The expedition discovered two old ANARE camps, one from 1974 at Mt Cresswell and one from 1959 at Binders Nunatak. Both of these sites were cleaned up and in the process a good deal of historical material was recovered. The discovery of an original ANARE 'barge caravan' (used to accommodate expeditioners on traverse in the 1950s) with all equipment in place was particularly exciting.

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Geological field camp in the Southern Prince Charles Mountains.

The final phase of the expedition was withdrawal from the field. All the waste that had been collected was removed from the field and camp stores were centralised at Mt Cresswell. The geophysics team flew to Mawson at the completion of their program and it was here that the aircraft was reconfigured to carry people and cargo by removing survey equipment and instrumentation.

While the helicopters delivered the field geologists and camp stores to Mt Cresswell the Twin Otter commenced flying stores and people to Mawson. To ease the burden on the stations and with a need to visit the Grove Mountains in mind, the team was split with half going to Mawson and half to Davis. With no sea ice at Davis on which to land the Twin Otter, a reconnaissance flight located an excellent skiway in a valley in the Vestfold Hills, affectionately known as 'Twotter Valley'. This required the use of helicopters to shuttle people and cargo between the station and the landing site. Taking one of the geologists to collect samples at Beaver Lake, Landing Bluff and Sansom Island, the helicopters made the journey from the PCMs to Davis in one long day. Flights to Davis then commenced as those who had flown to Mawson now boarded the *Polar Bird* in Horseshoe Harbour.

Those remaining at Mt Cresswell set about pulling down the base camp. This involved digging out and collapsing the large Weatherhaven tents, decommissioning the shipping container that had accommodated the pilots in order to store cargo once again, preparing traverse vehicles and sleds and packing some 5.5 tonnes of rock samples. The normally windy and cold conditions at Mt Cresswell abated to make this work more pleasant and by 28 January we were ready to go. A party of four was still at Wilson Bluff. They were collected by Twin Otter and flown to Davis via Mt Cresswell. The aircraft then returned the same day as the weather was forecast to deteriorate the following day, and completed the final passenger flight. It was an indication of the value of the excellent forecasting that the subsequent four days were not flyable. Just two days after this last passenger flight the traverse departed for the downhill run to Mawson. Left at Mt Cresswell were four quads and the large tents that were all flown out at the start of February. With these final cargo flights and a visit to the Grove Mountains from Davis we had completed all we had set out to do.

PCMEGA was ambitious and necessarily complicated from an operational and logistic perspective. It was an excellent example of what can be achieved both through international cooperation and teamwork from within the AAD. The words on all expeditioners' lips at the end of the summer were 'When we come back for PCMEGA 2 we will…'

Robb Clifton, Field Leader, PCMEGA