RADAR STATUS REPORT FOR CANADA

A. FUNDING STATUS FOR CANADA

Three major grants have been awarded to the Canadian team in 1999 and 2000

1. Prince George Radar construction (one year grant, 1999-2000)
   - Major Installation Grant (NSERC - Natural Sciences and Engineering Research Council of Canada)
   - Contract from Canadian Space Agency for transmitters (SIL Saskatoon)

2. Operation of Saskatoon and Prince George radar facilities (three year grant, 1999-2002)
   - Major Facilities Access Grant - NSERC
   - includes substantial portion of salaries of Engineer Mike McKibben and System Manager Dieter André

3. Salaries of Research Personnel at Canadian universities (five year grant, 2000 - 2005)
   - Collaborative Research Opportunities Grant - NSERC - to cover the salaries of scientists as follows at the universities of the Canadian SuperDARN team:
     University of Saskatchewan - Research Associate (Chao-Song Huang)
     University of Western Ontario - Research Associate (J Jayachandran)
     University of Alberta - Postdoctorate Fellow - position advertised
     University of New Brunswick - Part-time Research Associate (Slava Lyatsky)

B. Prince George SuperDARN Radar - Status Report

1. Site construction complted November 1999, with center of main array at geographic coordinates: 53d 58m 53s N 122d 35m 35s W (the partner radar at Kodiak has main array at: 57d 36m 47s N 152d 11m 21s W)
2. Radar became operational March 1, 2000
3. Two minor problems have been encountered and addressed.
   (a) There was a slow data transfer over the RF Modem link between the radar and UNBC (University of Northern BC, about 20 km west of the radar site). Mostly this problem is due to a grove of 50-foot high trees just to the west of the radar, blocking the direct line-of-sight to UNBC. This was corrected by installing a 60 foot tower to suspend the modem receive/transmit antenna at the radar site.
   (b) A second problem in data transmission occurred due to a faulty Ethernet card in the timing computer.

(Pictures provided
1. Mike McKibben, Head Engineer for the Canadian Team, shown pulling coaxial cable along the trench just back of the main antenna array.
2. An aerial view of the Prince George radar at midday in November. The boresite is 5 degrees W of N. Thus the sun is almost exactly in the geographic south.

3. A spring aerial view of the radar site at midday.

Comments: The Prince George radar shows very good ionospheric scatter conditions during the night, at ranges of about 700 - 2200 km, but there is a strong band of ground-scatter seen to the north of the ionospheric scatter. Oddly, this frequently has the shape of an AM@, much like a McDonald=s arch. That is appropriate because this feature is due to ground-scatter from the backward direction, and this is coming from the United States, well south of the 49th parallel marking the US/Canada border. This is clearly evident from elevation angle scans that have a very characteristic appearance, that is, the elevation angle varies from low to high to low with beam number, if the signal is coming from the Awrong@ direction. This effect is shown in two figures. In the first, the scan is assumed to come from the backward direction. In this case, the far-range ground-scatter has a Anormal@ elevation angle appearance going from high elevation angles of >18 deg at the nearer ranges to smaller angles of <18 deg at the far ranges. The near-range ionospheric scatter has the appearance characteristic of echoes NOT coming from the assumed backward direction, because these echoes come from the forward direction. The second plot shows the results of assuming that all the scatter comes from the forward direction. In this case, the ground-scatter signals at the far ranges show the characteristic appearance of echoes not coming from the assumed forward direction.

C. Saskatoon SuperDARN Radar Status Report

1. There was virtually continuous operation during the 99/00 year.
2. The 28.8 kbaud telephone modem was replaced with a 115 kbaud RF modem. The original idea was to test this RF modem for Prince George, but the new RF modem was so useful between the Saskatoon radar site and the university that it was decided to leave it installed permanently.
3. There were a number of computer break-ins at the radar site, so increased security measures were taken to prevent access from all but a few specified IP addresses.
4. The main QNX computer was upgraded to PIII-450 MHz.
5. There was a slightly higher than average failure rate on the High-power T/R switch pin diodes, which seems to accompany a FET failure in the final amplifier.

D. The SuperDARN Data Copy and Distribution Center at Saskatoon

1. To date, over 500 different Exabyte tapes have been duplicated.
2. Starting from the original Multiple-Radar Exabtyes provided by JHU/APL, copies of the tapes are made for 8 international partners and 4 Canadian partner sites (U of Sask, U of Alberta, U of Western Ontario, Communications Research Center in Ottawa).

NOTE 1: Recently, Simon Shepherd at JHU/APL and Mike McKibben have tested the copy process when APL sends MR-CDs rather than Exabyte tapes. This was successful, so in the future, APL will produce MR-CDs only.

NOTE 2: As a result of the Data Distribution Survey undertaken by Mike McKibben prior to the SuperDARN 2000 meeting, it is clear that almost all those receiving SuperDARN data would

prefer to receive CDs. Therefore, it is the intent of the Canadian team to purchase a CD-copying facility in the summer of 2000, and to start producing MR-CDs rather than MR-Exabyte tapes. We will delay the sending of CDs until most of the present supply of Exabyte tapes is used.