Date: September 29, 1994
To: EISCAT Data Representatives
From: Peter Collis
Subject: Common programme results tapes

Data from the following experiments have now been analysed and apes containing results in the standard format will shorttly be distributed. Plots of system temperature and transmitter peak power during these experiments are enclosed.

1994

CP -1 - K	12 - 13 Apr	(1600 - 2200 UT)
CP -7 - F	12 - 13 Apr	(1600 - 2200 UT)
CP -7 - F	3 - 4 May	(1230 - 2200 UT)
CP -6 - B	25 - 26 May	(1400 - 2200 UT)
CP -1 - K	8 - 9 Jun	(1608 - 2200 UT)
CP -4 - B	5 - 6 Jun	(1905 - 2200 UT)
CP -6 - B	11 - 12 Jul	(1700 - 1630 UT)
SP-EI-CP6B-EW	11 - 12 Jul	(1700 - 1630 UT)
CP -6 - B	11 - 13 Aug	(1645 - 1039 UT)
SP-EI-CP6B-NS	11 - 13 Aug	(1637 - 1039 UT)
CP -7 - F	6 - 7 Sep	(1902 - 2149 UT)

Notes

1. CP-1-K, 12-13 April.

Although this experiment was called CP-1-K, after 10 minutes' operation the Tromsø antenna was pointed vertical and the remote antennas were steered to intercept the beam. This configuration was maintained until the end of the experiment. The reason for doing this was to provide complementary measurements for the simultaneously-run CP-7 experiment. This run icluded a World Day period with a core interval of 24 hours starting at 16 UT on 12 April.

Even though the UHF high voltage was kept comparatively low because of known problems with leakage through the receiver protrctor, the far long pulse gates were contaminated at times.
These were not, however, the times of largest HV. One effect of this appears as an increasa of system temperature around 11 UT. The main consequence was a gap of about 10 minutes in the results at about 1230 UT. The alternating code results are complete, but the furthest long pulse gates were sometimes not fitted due to low snr. The heater was operating on 13 April between 1139 and 1144 UT at 4.04 MHz and between 1158 and 1202 UT at 4.544 MHz. No effect was seen in the UHF radar data.

2. CP-7-F, 12-13 April.
See above for the times of heater operetion, when clear backscatter power enhancements were seen in the VHF radar data. Otherwise, no reported problems.

3. CP-7-F, 3-4 May.
The experiment start was scheduled for 16 UT but was started early to allow data-taking during a

short heater operation for calibration purposes. The experiment was then left running when the calibration had finished. Heater frequencies of 4.04 MHz and 4.544 MHz were used, but only 4.04 MHz produced an observable effevt in the radar data. The heater 'on' periods (1s on, 9s off) were as follows (there may also be effects during tuning-up between these times):

UT (3 May)	MHz
1235-1249	4.544
1254-1259	4.04
1304-1312	4.544

The radar operation was relatively trouble-free, producing analysable data up to at least ~1400 km.

Disiscrepancies occurred between the CPU clock and the real-time clock on a small number of occasions during the morning of 4 May, by up to about 1 second as judged by eye. There is a gap in the data between 0622 and 0656 UT while the computer was stopped to try to fix this problem.

This run included a 24-hour World Day interval starting at 16 UT on 3 May.

4. CP-6-B-V, 25-26 May.

Although this experiment was called CP-6-B-V, the elevation was steered to 75.2˚ before the experiment started and left there throughout. No problems were encountered except on two occasions when the high voltage was raised from 82 to 86 kV, when crowbars occurred, so it was decided to use less than about 82 kV throughout the operation.

5. CP-1-K, 8-9 June.

There are gaps of about 20 minutes after 1939 UT on 8 June while the transmitter was off, and after 1627 UT on 9 June when the Tromsø UHF correlator was replaced by the one from the VHF side in an attempt to cure a problem observed in the alternating code data. The problem, appearing as improperly-fromed ACFs, had persisted from the beginning of the experiment. With the exception of the raw electron density, all Tromsø results from the alternating code have been set to-32767 on the result tape. Remote site results and Tromsø long pulse and power profile results were not affected. This run included a 24-hour World Day interval starting at 16 UT on 8 June.

6. CP-4-B, July 5-6.

This experiment started at 16 UT on 5 July but operational difficulties, related mainly to the transmitter, prevented good data from being collected until 1905 UT. At 2022 UT the experiment was stopped and the three default frequencies were changed from F3, F4 and F5, to F6, F7 and F8 because of the better characteristics, in terms of reflected power levels, of the latter set. The frequency codes for the two beam directions change from 2232 and 2234, to 2238 and 2240, respectively, at this time on the result tape. The improvement in system temperature can be seen on the enclosed plot. Pronlems with the transmitter persisted through the first half of the experiment, with sevsral HV trips;as a consequence the high voltage was kept relatively low throughout the run.

There is a data gap between 1038 and 1120 UT (6 July) due to a mains power break, following which the performance of the transmitter was more stable than earlier. This run included a 24-hour World Day interval starting at 16 UT on 5 July.

7. CP-6-B-V and SP-EI-CP6BV-EW, 11-12 July.

In this arrangement, the east panels of the VHF antenna were phased 14.8˚ to the west with antenna elevation vertical (azimuth returned as-88.5˚) for the SP-EI part, and the west panels ran the standard CP-6-B but the elevation was steered to 75.2˚ before the experiment started (azimuth 359.5˚). The east panels were accidentally set to 75.2˚ elevation at the start but were vertical by 1710 UT. The CP-6 data were received through the VHF receiver system (ALLX) and the SP-EI data were taken into the Yinput of the UHF receiver system. Otherwise, the SP-EI experiment is identical with CP-6 but the results have a code of 7000 on the result tape (cf. 6604 for CP-6-B).

The start was delayed by an hour after the scheduled 16 UT start (World Day core period) due to a problem with the transmitter. This same problem, with the intermediate power amplifier, caused some short gaps in the operation, but became critical at 1625 UT on 12 July. As it could not then be easily fixed and the World Day core period had been covered, and signals were anyway poor, it was decided to terminate the operation at that point.

8. CP-6-B and SP-EI-CP6BV-EW, 11-13 August.

The receiver arrangement was similar to that used during earlier operations of this pair of experiments; the CP-6 data were received through the VHF receiver system (ALLX) and the SP-EI data were taken into the Y input of the UHF receiver system.
However, contrary to the name of the SP-EI-CP6BV-EW experiment, the beam was not phased to the west as earlier, but simply steered to the north by moving the half-antenna in elevation.

The experiments were scheduled to be started at 16 UT on 10 August, but the start was delayed as a series of HV trips occurred at the beginning. After several hours a burned cable was discovered close to hte VHF klystron. This was removed and a replacement constructed from similar material. Many HV trips were experienced after the new start on 11th August. The transmitter was turned off between 1942 and 2035 UT to allow aluminium shielding to be put around the new cable. This improved matters, but trips still occurred every ~5 to ~25 minutes, causing off-air periods of 2-3 minutes as the transmitter was brought up again. Although not ideal, these frequent, brief gaps were deemed acceptable in the context of the main aim of the experiment, ie. To determine mesospheric winds, with implied time scales of ~tens of minutes or more.

A few crowbars occurred among the HV trips, but their frequency was not unexceptional until early on 13 August when quite a number were experienced, occasionally causing the ND computer to hang. It was thus decided to cancel the experiment at 1123 UT. This operation had been part of a World Day interval of seven days starting at 16 UT on 10 August.

9. CP-7-F, 6-7 September.

The VHF system was tested during the morning of 6 September but proved to crowbar easily at low voltages. It was therefore raised at a slow rate, reaching~60 kV by 10 UT, the planned start time. Over the next three hours several crowbars occurred and the high voltage could not be raised above 70 kV. At 1308 UT a further crowbar happened, following which it was discovered that one of the buffer decks was failing to pulse. The deck was raised from the oil tank and tasted, and eventually a fault was found in a ground-level amplifier. The transmitter was on the air again by 19 UT, which was then rescheduled as the start of the experiment proper. Operation continued until 22 UT on 7 September, but with a considerable number of short breaks due to crowbars, IPA trips and VAC-ION

trips. There is a gap of about 30 minutes after 0100 UT (7 September) due to various problems, including computer restarts, following a crowbar. This was a World Day interval of core period 24 hours starting at 16 UT on 6 September.