Date: April 27, 1987
To : EISCAT data representatives
From : Peter Collis
Re : Common Program Result Tapes

Four more tapes of analysed results from common programs have now been prepared, and copies of these will be sent to you shortly. The experiments include two runs of CP-3-C from world days early in 1984; the remainder are the first six experiments of 1987:

1984	CP-3-C	17/19 January	(10-24 UT)
	CP-3-C	7/8 February	(10-24 UT)
1987	CP-1-H	13/14 January	(14-23 UT)
	CP-2-D	20/21 January	(09-23 UT)
	CP-3-E	27/30 January	(09-09 UT)
	CP-1-H	10/11 February	(09-23 UT)
	CP-2-D	17/18 February	(09-09 UT)
	CP-1-H	24/25 February	(09-09 UT)

Plots of transmitter power and system temperature from these experiments are enclosed.

Notes.
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1)The peak power values for the two experiments in 1984 are probably underestimates. Values on the raw tapes were calculated from the average power divided by the duty cycle at that time, rather than from the polynomial expression using the high voltage, as is done presently. When calculated in this way from the high voltage, the values are of the order of 10% higher than those on the raw tapes, but they are of course quantised according to integer steps in the high voltage. The peak F-region densities also seem to be 10-20% too high if the recorded peak power is used, on the basis of comparisons with ionograms recorded at Ramfjordmoen during the experiments. For these reasons, a scaling factor of 0.87 has been applied to the density calculations for both experiments, equivalent to assuming that the peak power was 15% greater than actually recorded. The uncorrected power values are shown on the enclosed plots.

2) Problems with power recording have also occurred more recently, for the experiments in 1987.

a) Jan 13/14. A fixed value of 1.4 MW appears on the tapes from 1520 UT on 13 January to 0430 UT on 14 January. This value has been used in the analysis since there is no other information, but it seems to be a reasonable average of the actual values during the rest of the experiment.

b) Jan 20/21. No problems encountered.

c) Jan 27/30. Average peak power values for each post-integration interval (80 seconds, CP-3-E) were much noisier than expected. Values on the raw data tapes show evidence of a software logging problem, such that a true value of 1200 KW may sometimes appear as 800 kw, or occasionally as

400 kw. Thus the post-integration averages were always lower than the true averages should have been. For the purposes of analysis, this error was corrected by using fixed power values approximating the expected average. Three different values were used according to how the mean level varied. The enclosed plots show the average values from the raw tapes, and the values assumed in the analysis.

d) Feb 10/11. The power logging problem also occurred in this experiment. Average values from the raw tapes for the first 24 hours of the experiment are included in the plots. A fixed value of 1537 kw is on the raw tapes between 16 UT (10th) and 02 UT (11th). A better estimate of the actual power during this experiment was obtained by selecting the maximum peak power during each 5 minute post-integration, and these were used in the analysis. For the rare occasions when all values in a post-integration period were bad, then the last 'good' value was used. These values varied smoothly with time, but are of course slight overestimates, and the resultant densities will be underestimated. However, the variation among the 'good' power values was usually very low (smaller than 5%), and thus no worse than the accuracies normally expected in electron density. The actual peak values just before the period 200 kw less afterwards. Since there is no way of knowing when, or if, the actual power changed during this period, there may be a systematic error of up to 15% in the densities between 16 UT and 02 UT. Following the restart of the experiment at 02 UT (which recovered the power logging) a hardware fault (possibly a mistuned local oscillator) persisted until about 0620 UT. This affected only the long pulse results, and shows up as a step increase of about 200 K in F-region ion temperatures. These bad results can be identified by their larger than expected variances.

e) Feb 17/18. The power logging error persisted in this experiment, and was particularly bad at times (see plots). The data were analysed by taking the maximum peak power per post-integration, as for Feb 10/11, and the resultant power values showed no residual problems. Between 1050 and 1330 UT the electron densities from the low resolution (29 us) power profile are about a factor of two too small, probably indicating that 1 or 2 of the four channels which are added together in the correlator were wrongly set. The long pulse and pulse coded parts of the experiments were not affected.

f) Feb 24/25. The persisting power logging error was treated as for the previous two experiments, with no residual problems.