

**EISCAT Incoherent Scatter Facility
Catalogue of Observations
1984 Edition**

by

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1. Introduction

The European Incoherent SCATter (EISCAT) radar facility began operation in Northern Scandinavia in September 1981. The purpose of this report is to provide a catalogue of observations made in 1984. For completeness, all operations from EISCAT's inception in September 1981 through 1983 are also given in an Appendix. This report also briefly describes the facility, its location and operating parameters. Some general information is given about the types of observational programmes.

Brief descriptions of the more often used operating modes are included so that the reader may better assess the suitability of individual experiments for particular scientific investigations.

2. Background

The EISCAT Scientific Association was established in December, 1975 as an educational and scientific organization for the purpose of conducting high latitude upper atmospheric research using the Incoherent Scatter Radar (ISR) technique. Research councils from six European countries, (United Kingdom, West Germany, France, Sweden, Norway, and Finland), through the EISCAT Association, support the facility. The Association provides the instrumentation and observational opportunities for scientists from the six member countries to pursue their research in Northern Scandinavia.

The Incoherent Scatter radar technique is a very powerful one for studying the upper atmosphere. Using it, many important parameters characterizing the ionosphere and neutral atmosphere can be measured or inferred on a continuous basis over a large altitude region, typically 90-700 km. A list of representative deriveable parameters is given in Table 1. The ISR technique, therefore opens up wide new fields of upper atmospheric research. It is in some ways complementary to the intensive research efforts undertaken with satellites and rockets, but offers the advantages of continuous time and extended altitude coverage.

- Electron density
- Electron temperature
- Ion temperature
- Plasma velocity
- Ion composition
- Ion-neutral collision frequency
- Hall and Pedersen conductivity
- Electric Field
- Electrojet currents
- Neutral wind velocity
- Neutral density
- Neutral temperature
- Energy deposited by precipitating electrons
- Joule energy dissipation
- Energy spectrum of electron precipitation

TABLE 1 - Representative Physical parameters deriveable from EISCAT experiment

3. Location and geometry

The EISCAT facility presently consists of a tristatic UHF radar system operating at 933 Mhz. A second powerful radar system, operating in the VHF band at 224 Mhz, is currently being installed in Tromsö and is expected to begin operation in 1985. Inasmuch as all data taken to date are from the UHF system, only it will be described in this report. More details can be found in Folkestad et.al (1983).

The EISCAT UHF system consists of a transmitter located at Ramfjordmoen, near Tromsö, Norway, which operates as a monostatic radar. Additional receiving stations are located at Kiruna, Sweden and Sodankylä, Finland. The tristatic configuration permits measurement of the vector velocity of the ionospheric plasma flow. A 9600 baud data link connects the three stations. Figure 1 is a map of northern Scandinavia showing the locations of the stations. Their geographic and geomagnetic coordinates are given in Table 2. Because steerable antennas are used, the EISCAT system can probe regions hundreds of kilometers horizontally distant from the stations.

At high latitudes, many ionospheric phenomena are best placed in a geomagnetic frame of reference. Figure 2 shows invariant latitude as a function geographic latitude and longitude over the region of Northern Scandinavia viewed by EISCAT. The IGRF 1980 for January 1985 was used to model the earth's magnetic field.

Headquarters for EISCAT is located at Kiruna, Sweden, where the administrative and financial work of the organization takes place. Data processing, distribution, and archiving is also done at HQ using a large, ND-500 computer. The HQ computer is also connected to the site computers via a 9600 baud data link

1

Folkestad, K., T. Hagfors, and S.Westerlund, "an Updated Description of Technical Characteristics and Operational Capabilities", Radio Science, 18, 6, 1983.

	Tromsö	Kiruna	Sodankylä
<u>Geographic</u>			
Latitude, deg N	69.586	67.867	67.364
Longitude, deg E	19.23	20.44	26.63
Altitude, m	86.3	417.6	197.6
Distance from Tromsö, km	-	197.6	390.5
Azimuth to Tromsö, deg E	-	346.02	312.49
Azimuth to Kiruna	164.88	-	284.71
Azimuth to Sodankylä	125.57	98.96	-

Geomagnetic

Corrected

Geomagnetic Latitude, deg N	66.1	64.3	63.4
Geomagnetic Longitude, deg E	103.4	102.8	107.2
Invariant Latitude-ground	66.3	64.5	63.6
-300 km	66.8	65.0	64.2
L-value -ground	6.17	5.38	5.05
-300 km	6.44	5.61	5.26
Dip angle, deg -ground	77.62	76.80	76.73
-300 km	77.60	76.73	76.64
Declination, deg E ground	3.54	4.11	7.57
-300 km	1.76	2.41	5.56

TABLE 2 - Geographic and geomagnetic data for EISCAT sites. Magnetic coordinates are based on the IGRF 1980 time-dependent model for the date 1 January 1985.

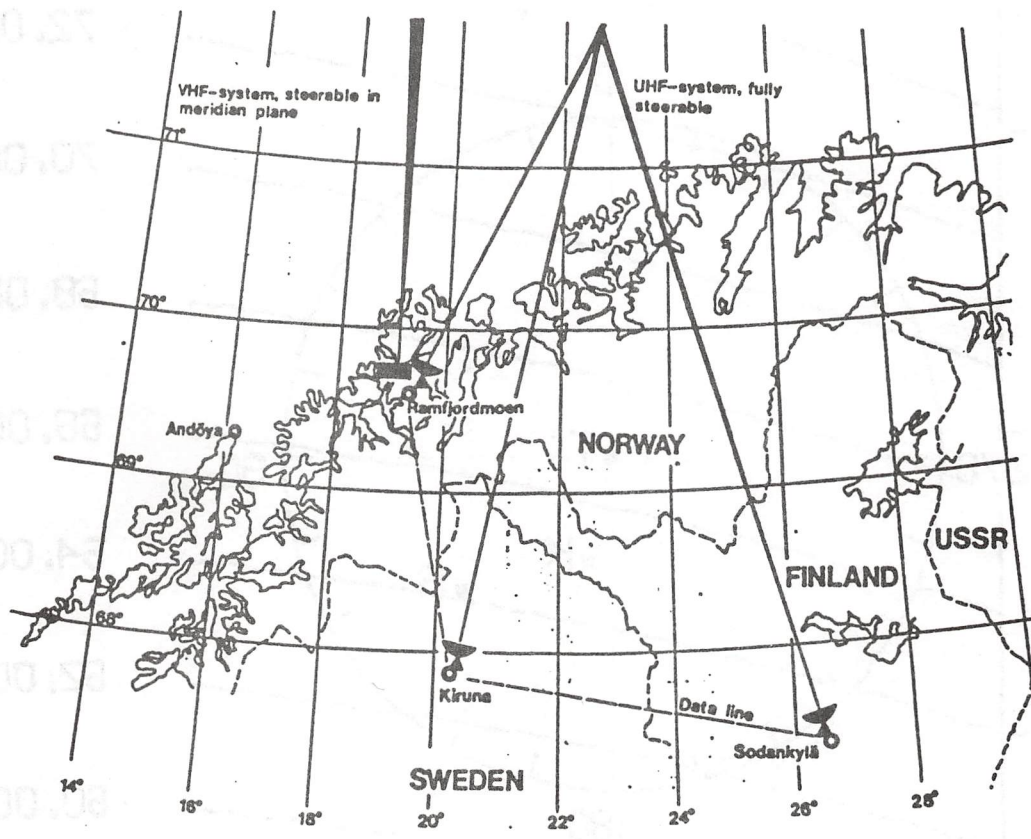


FIG.1. Map of Northern Scandinavia showing locations of EISCAT stations.

INVARIANT LATITUDES FOR YEAR 1985.0,

ALTITUDE 300 KM

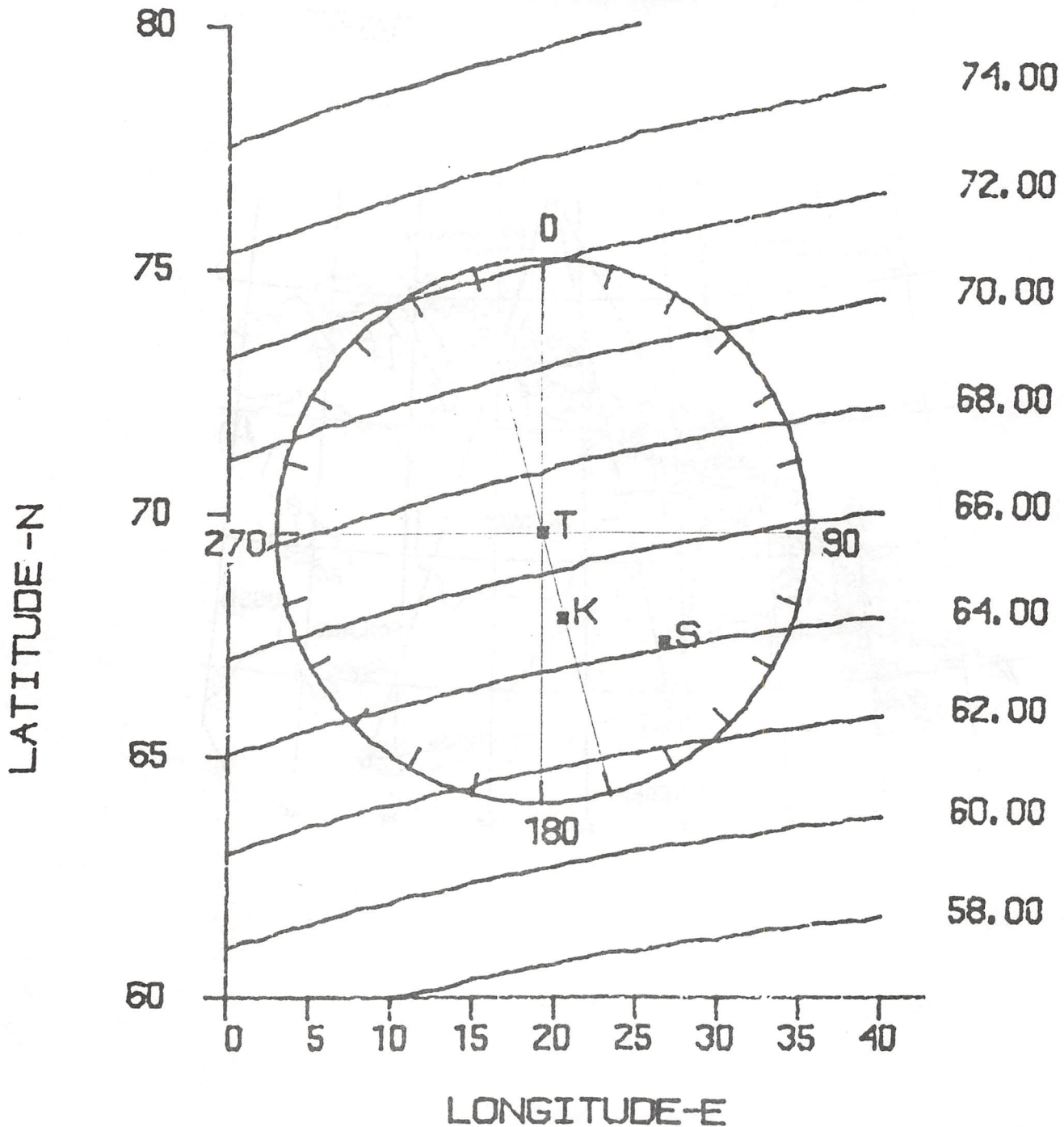


FIG.2. Contours of constant invariant latitude as a function of geographic latitude and longitude. The scales have been adjusted so that, at the latitude of Tromsø, distances are equal in both axes. The azimuth circle centered on Tromsø has a radius of 620 km and includes the area viewed at 300 km altitude with elevation angles above 26° .

4. Facility description

The parameters of the EISCAT UHF system are given in Table 3. A unique and very useful feature of the transmitter is its flexible modulation capability. Completely different pulse schemes can be transmitted at different frequencies within each pulse repetition period permitting several experiments to be run simultaneously. For example, a short pulse (or multipulse) high range resolution experiment can be performed simultaneously with a moderate pulse length F-region experiment and a long pulse length suitable for remote reception. This feature allows the full duty cycle of the transmitter to be effectively utilized, reducing the required integration time.

The shape of the three identical EISCAT antennas has been adjusted slightly from the conventional paraboloid-hyperboloid geometry to increase the efficiency. The polarization flexibility enables optimum matching of the transmit and receive polarizations to maximize the power transfer.

There are 8 receiving channels available at each site to match the multiple frequency transmission possibilities. Each channel is quadrature detected and sampled by analogue-to-digital converters. The digitized signal(s) are sent to a Barker decoder (if required) and thence to a high speed programmable correlator for real-time preprocessing.

Each site is controlled by a general purpose digital computer. The computer, through the EISCAT Real-time Operating System (EROS), points the antennas, sets the receiver channel local oscillator frequencies and gains, sets the sampling rates and range windows, formats the processed data from the correlator, provides real time displays, and records the data plus house-keeping information on digital magnetic tape. The physical parameters of the ionosphere and atmosphere can be extracted from the data tapes at HQ using appropriate, well-tested computer programs.

Transmitter

Maximum pulses Power	2.0 MW
Maximum duty cycle	12.5%
Operating frequencies	$929.5 + 0.5n$ ($0 < n < 15$) MHz
Pulse widths	10-10000 μ s
Maximum waveform repetition rate	1000 Hz
Modulations	on-off, phase-flip, frequency-step

Antenna - all sites

Diameter	32m
Efficiency	70%
Optics	Cassegrain
Polarization	arbitrarily se- lectable (circular transmitted)
Axes	Azimuth/Elevation
Azimuth range	540°
Elevation range	95°
Maximum angular rate	1.3° /sec (each axis)

Receivers

Type	Cooled Parametric amplifier (remote sites) GaAsFET (Tromsö)
System Temperature	~ 45 K (remote sites) ~ 130 K (Tromsö)
Number of channels/site	8
IF filter Bandwidths	1.2, 8.0, 30.0 MHz (selectable)
Detector	Synchronous de- modulator yielding quadrature com- ponents
Post-detection filters (selectable)	
Butterworth and Linear phase	25.0, 50.0, 100.0 kHz
Linear phase only	17.7, 35.4, 70.7, 176.8, 250.0 kHz
Butterworth only	12.5 kHz
Wideband	500, 1000, 2000, 2500 kHz

TABLE 3 - Parameters of the EISCAT UHF system.

5. Complementary Instrumentation

A large number of complementary instruments, ionosondes, magnetometers, riometers, photometers, all-sky cameras and the like, are routinely operated in Northern Scandinavia monitoring the region viewed by EISCAT. In addition several other facilities of related research interests exist: the STARE, SABRE and SAFARI auroral radars; the MPAe heating facility, HILAT Satellite receiving station, and Partial Reflection experiment, near Tromsö; the rocket ranges at Andöya in Norway and ESRANGE near Kiruna. The three sites are located near three very active institutions of auroral research: the Sodankylä Geophysical Observatory, the Kiruna Geophysical Institute and the Tromsö Auroral Observatory, resulting in fruitful interactions between scientists from those institutions and EISCAT. A more complete description of the supporting instrumentation is given by Pellinen and Nevanlinna (1982).¹

6. EISCAT Observing programmes

The observing time at EISCAT is divided into two main categories, called common programmes (CP) and special programmes (SP). As a goal, time on the facility is approximately equally divided between these two types of programmes. The CP and SP observations provide observing time and data to scientists from the EISCAT associate countries.

In addition, observing time can be made available to EISCAT staff and to non-associate (third party) scientists. A brief description of the types of programmes, ownership and use of data is given in the Appendix A, "Guidelines for Management of Scientific Programmes, Observing Time and Use of Data."

6.1 Common Programme Objectives

At present, common programmes are scheduled to run for 24 or more continuous hours, approximately 40 times per year. This operational level has been achieved since mid-1983.

The goal of the CPs is to provide a data base for long term synoptic studies. Therefore, a small number of experimental modes are employed and each mode is used approximately once per month. Data from the common program operations are available to scientists from all six Associate countries.

In the catalogue proper, common programme operations are identified by the initial letters CP in the experiment name. Following the first two letters is a number designating which of the CP's was run. Following the number is another letter designating the version of the program. Each version of a CP has evolved and been improved from the previous version while leaving the basic experiment concept unchanged. In the following section we briefly describe the CPs most frequently used during 1984.

¹ R. Pellinen and H. Nevanlinna, 1982, CCOG Newsletter No 82/1 "Supporting Observations for EISCAT and Viking in Northern Europe", Committee for Coordination of Observations made on Ground, Finnish Meteorological Institute, Box 503, SF-00101 Helsinki 10, Finland

A more detailed description of the common program evolution since 1981 is given in Appendix B.

Requests from EISCAT-associate scientists for CP data should be made through their national representative(s) (Appendix C).

Inquiries from non-EISCAT associate scientists regarding data from common programme experiments should be directed to:

Director,
EISCAT Scientific Association
Box 705
S-98127 KIRUNA
Sweden
Telex: 8778.

6.2 Common Programme experiments in 1984

Three basic CPs run in 1984 were CP-1 (evolved from CP-0), CP-2 (evolved from CP-M2) and CP-3.

The goal of CP-1 is to provide measurements with excellent time and altitude resolution for measurement of substorm phenomena. In CP-1, the transmitter beam is held fixed in a direction parallel to the earth's magnetic field in the E-region. A rather complicated waveform is transmitted which includes: two 360 μ sec pulses for F-region ACF measurements, two multipulse bursts for E- and lower F-region ACF measurements, a single short pulse of length equal to the pulse element of the multipulse bursts for ACF O-lag estimation and high resolution power profile, a 60 μ s pulse for power profile measurement. Altitude coverage is approximately 155-700 km for the 360 μ s pulse, 84-170 km for the multipulse bursts (version E), and 87-340 km for the 60 μ s power profile.

For CP-1 (versions D and F), the remote receiving antennas pointed sequentially at five altitudes, four position spaced between 100 and 130 km in the E-region and one position at 312 km in the F-region. The total remote antenna cycle time is 10 minutes with about half the time spent in the F-region and the other half divided equally between the four E-region positions. This scanning provides vector velocity measurements at the five altitudes. For version C, only one E-region altitude and one F-region altitude were viewed by the remote antennas.

The goal of CP-2 is to study wave phenomena by fairly rapidly scanning in a few directions so as to measure both spatial and temporal variations of ionospheric parameters. The CP-2 experiment evolved from version M2-D to version 2-B in 1984. In version M2-D, a fairly simple waveform was used consisting of a single 360 μ s pulse for ACF measurements and a 60 μ s pulse for power profile measurements. In version 2-B a second 360 μ s pulse was added for remote reception to improve the measurement accuracy. A 20 μ s power profile pulse was also added to provide better altitude resolution in the D- and E-region.

For CP-M2-D, the transmitting antenna was sequently pointed to three positions which formed a triangle in the F-region with

vertices spaced by 130 km. The remote antennas tracked this triangle at an altitude of 312 km. Six minutes were required for the complete antenna cycle. For CP-2-B, one additional pointing direction parallel to the earth's magnetic field was included but the cycle time remained the same.

The goal of CP-3 is to provide measurements of the latitudinal structure of ionospheric parameters. For this experiment, a 15-position scan is employed resulting in a (geographic) latitude coverage of 64.2-74.2° at an altitude of 325 km. The plane of the scan is approximately perpendicular to the L-shells. The remote antennas track the transmitter beam at an altitude of 325 km. The waveform used in CP-3 consists of three pulses: a 1000 μ s pulse for remote station (only) reception, a 360 μ s pulse for backscatter measurement of ACF's, and a 60 μ s pulse for power profile measurements. The cycle time for this experiment is 30 minutes.

6.3 Special Programme objectives

Special programmes (SPs) are defined individually by an associate or group of associates. Observation time on the EISCAT facility for special programme operations is allocated to each associate in proportion to his financial contribution to EISCAT. Data recorded during SP operations is released only to the associate responsible for the experiment for a period of one year. Afterward, it is available on request to all the EISCAT associates.

Many special programme operations have been performed. Some have been in conjunction with rocket or satellite experiments, or other groundbased facilities (e.g. STARE radar, MPI Heating facility, optical observatories). Others have been oriented toward studying particular phenomena of interest to individual associate scientists (e.g. mesosphere, stratosphere, plasma waves, ion composition). Still other SPs have utilized better resolution in space or time than is available with the common programmes.

The large number of different special programme experiments which have been run to date preclude including descriptions in this report. Inquiries regarding SP operating modes and data availability should be addressed to the national representative of the EISCAT associate country responsible for the SP experiment of interest. A list of the national representative is given in Appendix C.

7.0 Observations - 1984

The following lists show the dates and times during which the EISCAT UHF transmitter was in operation and ISR data were recorded at Tromsø. For most of the periods shown, both of the remote receiving stations also recorded data. Universal time (UT) is used throughout. Local solar mean time at the Tromsø station equals universal time plus one hour and seventeen minutes. Thus local solar midnight occurs at 2243 UT. Local

magnetic midnight occurs at about 2145 UT, \pm 20 minutes depending on season.

Experiment names are coded in the following manner.

Common Programs: CP-DD-V
where DD = a single digit, 0-3, sometimes preceded by the letter M.
V = version of program, a letter.

Special Programs: SP-AA-NAME
where AA is the associate country responsible for the experiment, and
NAME is a descriptive name given to the experiment. The country codes are:
FI= Finland
FR= France
GE= West Germany
NO= Norway
SW= Sweden
UK= United Kingdom
EI= EISCAT staff.

When more than one country participates in an SP experiment, the AA designator is given as AA/BB/CC... where the list separated by slashes shows the participating countries.

When one country or the same group of countries runs several contiguous experiments, the experiment names are separated by slashes NAME1/NAME2/... .

Data gaps of less than 20 minutes are not shown.

7.1 Overview

During the calendar year 1984, EISCAT recorded 1922 hours of incoherent scatter data. This is 86% higher than the total for 1983. In addition, several passive (radio astronomy) experiments were performed that do not appear in the catalog.

The distribution of time between common and special programmes as a function of month of the year is shown in Figure 3. It can be seen that the total operational time was approximately equally shared between CPs and SPs.

The distribution of special programme operating hours in 1984 among the EISCAT users is shown below:

<u>User</u>	<u>active expt.hrs</u>	<u>passive ext.hrs</u>
FRANCE	217.55	-
GERMANY	138.71	8.0
UNITED KINGDOM	313.00	-
SWEDEN	84.05	96.0
NORWAY	163.72	-
FINLAND	37.03	11.35
EISCAT staff	40.48	28.0
TOTAL	994.54	143.35

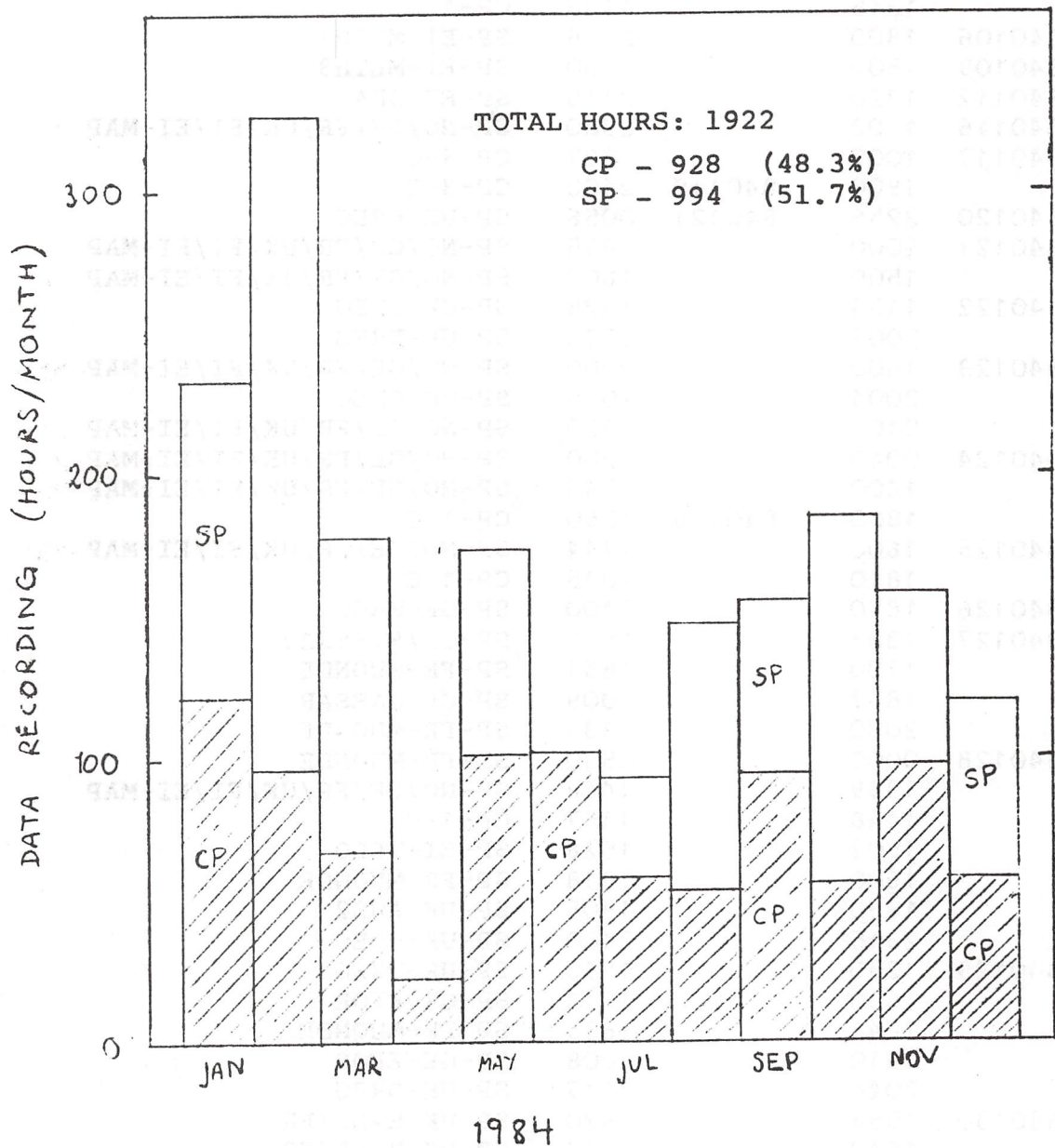


Fig.3 EISCAT data recordings by month.
 Common programme (CP) and
 Special programme (SP) shown separately.

7.2 Catalog - 1984

START-UT		END-UT		EXPERIMENT NAME
YYMMDD	HHMM	YYMMDD	HHMM	
840104	1000	840105	1224	CP-O-H
840105	1250		1338	CP-O-I
	1345		1438	CP-1-C
840106	1800		2305	SP-EI-MLTH1
840109	1800		2300	SP-EI-MLTH3
840112	1720		2115	SP-EI-SRA
840116	1702		2300	SP-NO/GE/FR/UK/FI/EI-MAP
840117	1000		1827	CP-3-C
	1900	840119	2400	CP-3-C
840120	2256	840121	0056	SP-UK-DREG
840121	1000		1435	SP-NO/GE/FR/UK/FI/EI-MAP
	1500		1600	SP-NO/GE/FR/UK/FI/EI-MAP
840122	1154		1325	SP-UK-DREG
	2006		2233	SP-UK-DREG
840123	1400		2000	SP-NO/GE/FR/UK/FI/EI-MAP
	2004		2056	SP-UK-DREG
	2100		2320	SP-NO/GE/FR/UK/FI/EI-MAP
840124	0040		1200	SP-NO/GE/FR/UK/FI/EI-MAP
	1400		1748	SP-NO/GE/FR/UK/FI/EI-MAP
	1800	840125	1550	CP-1-C
840125	1600		1744	SP-NO/GE/FR/UK/FI/EI-MAP
	1810		2035	CP-1-C
840126	1850		2400	SP-GE-MAGC
840127	1333		1655	SP-GE/EI-SRA3
	1700		1851	SP-FR-MUONDE
	1857		2009	SP-GE-CAESAR
	2030		2333	SP-FR-MUONDE
840128	0000		0530	SP-FR-MUONDE
	1339		1442	SP-NO/GE/FR/UK/FI/EI-MAP
	1448		1457	CP-1-C
	1502		1526	SP-EI-VELO
	1600		1818	SP-FR-MUONDE
	1830		1905	SP-UK-AUS2
	2315		2400	SP-UK-DREG
840129	1230		1530	SP-UK-DREG
	1630		1643	SP-GE-EFOR
	1648		1835	SP-FR-MUONDE
	1910		2008	SP-GE-EFOR
	2040		2117	SP-UK-DREG
840130	1558		1620	SP-UK-RALE/FR
	1642		1802	SP-UK-RALE/FR
	1817		2000	SP-GE-EFOR
	2015	840131	0842	SP-FR-MU2/MU15
840131	0845		0940	SP-UK-DREG
	1000		1430	CP-1-C
	1604		1720	CP-1-C
	1730		2043	SP-NO/GE/FR/UK/FI/EI-MAP
	2050		2400	CP-1-C
840201	0000		0945	CP-1-C
	1015		1116	SP-UK-DREG
	1130		1553	SP-UK-TOPS
	1600		1755	SP-UK-NNSS
	1810		2235	SP-GE-MAGC

	2250	840202	0100	SP-UK-RALE/FR
840202	0110		0354	SP-FR-MU2/15
	0412		0540	SP-UK-RALE/FR
	0545		0604	SP-FR-MU2/15
	1600		1843	SP-UK-RALE
	1857		2035	SP-GE-EFOR
	2051	840203	0130	SP-GE-MAGC
840203	0142		0253	SP-GE-CPIC
	0307		0323	SP-GE-EISO
	0700	840204	0401	SP-UK-POLA
840204	1600		2400	SP-UK-TOPS
840205	1500		1932	SP-FR-CP3E
	1940		2341	SP-FR-AIDA
840206	0000	840207	0116	SP-FR-CP3E/AIDA
840207	0330		0701	SP-FR-AIDA
	1000	840208	2400	CP-3-C
840209	0010		0320	SP-NO/GE/FR/UK/FI/EI-MAP
	0900		1001	SP-NO/GE/FR/UK/FI/EI-MAP
	1110		1134	SP-SW-BLOB
	1236		1249	SP-SW-PSAU
	1500		1600	SP-NO/GE/FR/UK/FI/EI-MAP
	1645		2332	SP-UK-JOU/STIL/SLOW/DREG
840210	0000		0720	SP-NO/GE/FR/UK/FI/EI-MAP
	1051		1153	SP-NO/GE/FR/UK/FI/EI-MAP
	1600		2334	SP-UK-NORT/EFIR/DREG
840212	1430		1711	SP-NO/GE/FR/UK/FI/EI-MAP
840213	1540		1930	SP-NO/GE/FR/UK/FI/EI-MAP
	2030		2400	SP-FI-ESLA
840214	0020		0232	SP-NO/GE/FR/UK/FI/EI-MAP
	0250		0400	SP-EI-SRA3
	0710		0910	SP-NO/GE/FR/UK/FI/EI-MAP
	1000	840215	1010	CP-1-C
840215	1024		1411	SP-FI-COMP
	1420		1940	SP-NO/GE/FR/UK/FI/EI-MAP
	2000		2400	SP-FI-ESLA
840216	0005		0850	SP-NO/GE/FR/UK/FI/EI-MAP
	1010		1410	SP-FI-ESLA
	1420		1955	SP-NO/GE/FR/UK/FI/EI-MAP
	2000		2400	SP-FI-ESLA/PCA
840217	0020		1400	SP-NO/GE/FR/UK/FI/EI-MAP
	1410		2300	SP-FI-ESLA
	2310		2400	SP-UK-POLZ
840218	0010		0429	SP-NO/GE/FR/UK/FI/EI-MAP
840224	1730		1840	SP-SW-IONC
	1955		2049	SP-SW-IONC
	2115		2332	SP-SW-BLOB
840225	1734		2300	SP-SW-IONC/BLOB
840226	1700		2322	SP-SW-ARCS/WTSU/JOUL
840227	1622		2052	SP-FR-MU4
	2105		2128	SP-SW-WTSU
840228	1000		2400	CP-1-C
840229	0030		0116	CP-1-C
	0140		1030	CP-1-C
	1100		1400	SP-GE-CPOH
	1730		2258	SP-SW-IONC/WTSU/BLOB

840301	1100		1400	SP-GE-CPO
	1600		1903	SP-FR-M22
840302	1500		2400	SP-SW-IONC/ARCS/WTSU/PSAU
840303	1445		2400	SP-FR-M4/M22
840304	2030		2203	SP-SW-WTSU
840305	1100		1330	SP-GE-CPO
	1400		2027	SP-FR-CP3E
	2035		2115	SP-SW-WTSU
	2120	840306	0945	SP-FR-SRHL/CP3E
840306	1000	840307	1100	CP-3-C
840307	1130		2400	CP-3-C
840308	1430	840309	0110	SP-SW-IONC/ARCS/WTSU/JOUL
840309	1100		1319	SP-GE-CPO
840311	1800	840312	0837	SP-FR-CP3E/SRHK/CP3E
840312	1400	840313	1030	SP-FR-CP3E
840313	1100	840314	1648	CP-M2-D
840314	1700		2146	SP-SW-IONC
	2245	840315	0340	SP-FR-M22
840315	1700		2300	SP-SW-ARCS
840424	1100		1457	CP-3-C
	1621	840425	1101	CP-3-C
840502	1000	840503	1000	CP-1-D
840503	1015		1135	SP-EI-CP1XX
840508	1300	840509	2357	CP-3-C
840510	0906		1059	SP-NO-RESB
	1425		2148	SP-NO-ANI1/PSMO1
840511	1402	840512	0128	SP-NO-ANI1
840514	1401		2206	SP-NO-ANI1
840515	1004	840516	1000	CP-2-B
	1023		2200	SP-NO-ANI1/PSMO1
840518	0916		1105	SP-NO-PSMO1
	1359		2200	SP-NO-ANI1/F1345
840526	1003		1313	SP-GE-EFOR/EISO
840528	1700		2134	SP-GE-MAGC/EFOR
840529	1200	840530	0646	CP-1-D
840530	1012		1528	SP-GE-PL5
	1600		2017	SP-GE-EISO
840531	1025		1045	SP-NO-RAWIND
	1128		1456	SP-GE-PL5/PLTR1
840606	1200	840607	1205	CP-1-D
840612	1000		2057	CP-3-C
840613	0106		0227	CP-3-C
	0530		0757	CP-3-C
840626	0700	840627	0322	CP-3-C
840627	0354	840628	2400	CP-3-C
840711	1735		1935	SP-UK-SOUT/NNSS
840712	1300	840713	1300	CP-1-D
840713	1330		2150	SP-UK-ESLA
840714	1335		2152	SP-UK-ESLA/SUOM
840716	1257		2153	SP-UK-SUOM/NNSS
840717	1300		2200	SP-UK-ESLA
840723	1200	840724	2200	CP-3-C

840817	1507	840818	0550	SP-NO-ESLA/CEBO
840818	1650		1935	SP-NO-ESLA/CEBO
	2022	840819	0553	SP-NO-CEBO/ESLA
840819	1630	840820	0551	SP-NO-ESLA/CEBO
840820	1532		1642	SP-NO-CEBO/ESLA
	1711		2117	SP-NO-CEBO/ESLA
840821	1300		2127	CP-3-C
	2230	840822	1527	CP-3-C
840822	1832		2157	CP-3-C
840823	1626		2200	SP-NO-ESLA
840824	1600		2110	SP-NO-ESLA
840825	1440		2400	SP-NO-CEBO/ESLA
840826	1341	840827	0312	SP-NO-CEBO
840827	0340		0600	SP-NO-CEBO
840828	1648	840829	0630	SP-NO-CEBO
840829	0700	840830	0705	CP-2-B
840912	0700	840913	0700	CP-1-D
840917	1410		1605	SP-UK-AGWL
	1630		2115	SP-UK-NNSS
840918	0714		1025	SP-UK-POLA
840919	1300	840920	2400	CP-1-D
840921	0000		1027	CP-3-C
	1035		1125	SP-EI-CP1D/CP1XX
	1315		2102	SP-UK-AGWE/SOUT/WW
840922	0700		1116	SP-UK-AGWW/WE
	1300		2056	SP-UK-WE/SOUT
840924	1518		2033	SP-UK-SOUT/CP1D/NNSS
840925	0759		1115	SP-UK-CPOR/JOUL
	1300		1500	CP-2-B
	1531	840926	1300	CP-2-B
840926	1450		2055	SP-UK-CP3R
840927	0700		1106	SP-UK-CP3R
	1347		1438	SP-UK-JOUL
	1538		2030	SP-UK-NNSS
840928	0900		1103	SP-UK-AGWE
	1326		1815	SP-UK-NNSS
	1839		2038	SP-UK-NNSS
840929	0559		1833	SP-UK-POLA
840930	0729		0740	SP-UK-SIRB
	0932		1100	SP-UK-SIRB/NNSM
	1339		2150	SP-UK-NNSM
	2304		2340	SP-UK-POLZ
841003	1400	841004	0629	CP-1-F
841015	1640		2217	SP-GE-MAGC
841016	1300		2253	CP-3-C
	2330	841017	1515	CP-3-C
841017	1830	841018	0757	CP-3-C
841018	1020		1600	SP-GE-EFOR
	1800		2242	SP-GE-MAGC
841019	1000		1703	SP-GE-ESLA
	1815	841020	1500	SP-GE-MAGC/EFOR
841020	1524		1610	SP-UK-POLA
	1625		1647	SP-SW-NWIN
	1715		2254	SP-GE-MAGC

841021	1549		1656	SP-UK-POL5
	1700		2255	SP-GE-MAGC
841022	1059		1230	SP-UK-POL5
	1315		1405	SP-SW-HEAT/VELD
	1630		1647	SP-EI-PLTST
	1700		2250	SP-SW-HEAT/VELD
841023	1700		1949	SP-GE-MAGC
	2100		2252	SP-GE-MAGC
841024	1145		1242	SP-SW-HEAT/MTOR/STOR
	1645		2247	SP-SW-HEAT/MTOR/STOR
	2309	841025	1530	SP-UK-POLA
841025	1600		1640	SP-SW-HEAT
	1715		2200	SP-SW-NWIN
841026	0818		1115	SP-SW-HEAT
	1225		1530	SP-SW-HEAT
	1700		2100	SP-GE-EFOR
	2120		2157	SP-GE-CAES
	2344	841027	1535	SP-UK-POLA
841028	0830		0901	SP-UK-POLA
	1133		1400	SP-SW-HEAT
841106	1555		1720	CP-1-D
	2100	841107	0730	CP-1-D
841113	1200	841114	2300	CP-3-C
841115	1310	841116	1345	SP-FR-M22/CPIF
841118	1600	841119	0430	SP-FR-CP3C/HILAT
841119	1700	841120	0114	SP-FR-CP3C
841120	0310		0431	SP-FR-HILAT
	1304	841121	1304	CP-2-B
841121	1430	841122	0141	SP-FR-CP3C
841122	1340		1440	SP-EI-GENTST
841123	1225		1407	SP-EI-TEST
841126	1300	841127	1300	CP-1-F
841212	1200	841213	1200	CP-1-F
841213	1245		1610	SP-UK-NNSM
	1634		2010	SP-UK-NNSM/DPOF
	2034	841214	0716	SP-UK-DPOF
841214	0841		2145	SP-UK-DPOF
841215	0753		1102	SP-UK-FIRR
	1129		1857	SP-UK-FIRR
	1940	841216	0230	SP-UK-FIRR
841216	0255		0813	SP-UK-FIRR
841217	1414		2327	SP-UK-SABR
841218	1400	841219	2400	CP-3-C

GUIDELINES FOR MANAGEMENT OF SCIENTIFIC PROGRAMMES, OBSERVING TIME
AND USE OF DATA

1. PURPOSE AND OBJECTIVES

- 1.1. This document is based on those Statutes of the EISCAT Scientific Association relevant to EISCAT Scientific Programmes, Observing Time and Use of Data and should be read, when necessary, in conjunction with those Statutes.
- 1.2. The objective of the guidelines set out in this document is to ensure (a) that the best possible scientific returns are obtained and (b) that each Associate is assured of its equitable share of scientific results.
- 1.3. Article 13 of the EISCAT Statutes states that the observing time shall be made available for
 - (a) a programme common to all Associates
 - (b) particular programmes of each Associate
 - (c) such programmes of third parties that may be agreed ...

Type (b) are commonly termed "Special Programmes".

1.4. Scientific Co-operation Between EISCAT Associates

In many fields of study the best scientific return will result from co-operation between scientists within the Associate countries. In order to enable EISCAT staff and SAC to give advise on such co-operation it is hoped that scientists will inform the Director and SAC about ongoing studies involving EISCAT data even when the work proposed is based on Common Programme data. It is, of course, understood that there is no obligation to submit proposals for independent work based on Common Programme data.

2. COMMON PROGRAMME

- 2.1. Great importance is attached to the Common Programme and in particular to long term routine observations. The major contribution of incoherent scatter radar to upper atmosphere science has in the past to a large extent come from the analysis of data obtained from standard observations covering different times and seasons, varied geomagnetic conditions and different phases of a solar cycle. EISCAT will be no exception.

- 2.2. After an initial trial period to be closely supervised by SAC the observational procedures shall only be substantially modified when major changes in EISCAT facilities make it desirable. Examples of such major changes will be the commissioning of the VHF system and subsequent split beam operation.
- 2.3. Proposals for changes in the Common Programme shall be submitted to both the Director and the Chairman of SAC.
- 2.4. The choice of observations within the Common Programme and distribution of time allotted to each of these shall be made by the Director on the recommendation of SAC.
- 2.5. Common Programmes can be interrupted, for example in support of rocket campaigns, or at short notice during unexpected or unusual phenomena as described in Article 3.10. Such interruptions must be kept to a minimum and must be approved by the Director or, if not feasible, by the officer in charge of the programme. Data collected during these periods shall form part of the Common Programme. The Director shall report the circumstances of such interruptions at the next subsequent meeting of SAC.

3. PARTICULAR PROGRAMMES

- 3.1. Proposals for particular programmes should contain information as specified in the standard format available from EISCAT Headquarters. Proposers should consult the "Procedures for EISCAT Special Programme Experiments" issued by Headquarters. Proposers may request that their proposals are held in confidence.
- 3.2. Each Associate will set up an internal review system to deal with particular programmes according to rules which are of no concern to EISCAT.
- 3.3. Each Associate shall appoint a contact person with whom the EISCAT Director can discuss general matters concerning proposals submitted by that Associate.
- 3.4. Each Associate shall submit proposals to the EISCAT Director with the appropriate internal preferences and priorities indicated.
- 3.5. Associates may combine to propose to allocate a certain fraction of their particular programme time to scientific programmes of joint interest.
- 3.6. Upon review of the proposal for particular programmes the Director shall either schedule the programme forthwith, or he shall suggest modifications which will be discussed with the experimenter; the contact person will be kept informed.

- 3.7. Where proposals from two or more Associates are identical or nearly identical the Director shall suggest to the respective contact persons and experimenters - if the proposals so indicate - a pooling of efforts and a sharing of observing time. The amount of observing time allotted to such a shared effort by the participating Associates shall be a matter of mutual agreement.
- 3.8. The Associates are invited to involve members of the EISCAT staff (including the contract staff) as participating partners in some of their scientific programmes. Such partnerships must be approved by the Director.
- 3.9. The Director shall provide SAC with a schedule of actual and proposed observations and invite its comments. In particular SAC shall discuss whether the schedule arising from the proposed observations provides a reasonable coverage of the problem areas that ought to be examined.
- 3.10. If an unexpected or unusual phenomenon natural or otherwise occurs, observation of which would be so valuable as to warrant interruption scheduled programmes or starting up the system at short notice, the Director or other officer in charge may take the initiative. The data collected shall belong to the Common Programme and all Associates shall be notified as soon as possible of such observations. The SAC will discuss any such occurrence at its next subsequent meeting.

4. USE OF EISCAT BY COLLABORATING SCIENTISTS, THIRD PARTIES AND STAFF

- 4.1. Parties not belonging to the Association may take use of EISCAT on terms approved by the Council in each case. Scientific collaboration with scientists or scientific institutions from non-Associate countries is to be encouraged along the following guidelines.
- 4.2. Applications for observing time from third parties shall be submitted to the Director who shall seek the views of SAC before submitting them to the Council for decision.
- 4.3. Whenever collaborative work with scientists from non-Associate countries involving the use of EISCAT data is undertaken, the EISCAT Director shall be informed and he will at his discretion report to the next meetings of SAC and Council.
- 4.4. Any scientific paper resulting from such collaboration shall include as coauthor(s) the participating scientist(s) from the Associate country or the EISCAT staff, with appropriate acknowledgement of the support provided by EISCAT.

- 4.5. Summaries of data, such as microfiche surveys, may be supplied for the purpose of identifying specific periods when a combination of EISCAT data with data from some other facility (such as another incoherent scatter facility or a satellite) appears likely to produce significant results. However there shall be no bulk transfer of EISCAT data in raw or reduced form to scientists from non-Associate countries without the permission of the EISCAT Director who will act in consultation with the SAC, and who will report to the next Council.
- 4.6. "Bulk transfer" means the supply of sets of data sufficient to enable the recipient to carry out research principally based on EISCAT data.
- 4.7. Up to five percent of the observing time is available for EISCAT staff to be apportioned at the discretion of the Director.

5. OWNERSHIP AND USE OF DATA

- 5.1. Article 14 of the Statutes states:

"The Association shall encourage the publication of all scientific results obtained using its facilities. All data collected shall be the property of the Association and shall be made freely available to all the Associates and the Association's staff. However, in the case of data obtained from the programmes specified in paragraphs 1(b) and (c) of Article 13 those responsible for the programme shall have the right of first use of the data for the purpose of publication of scientific results for a maximum of twelve months from the date of collection, after which time the data must be made freely available to all the Associates and the Association's staff". (Paragraphs 1(b) and (c) of Article 13 refer to particular programmes and third-party programmes, respectively.)
- 5.2. Published papers in which data from the EISCAT facility have been used shall always contain an acknowledgement of the support provided by EISCAT.
- 5.3. Authors are expected to send preprints of papers, as well as reprints after publication, to the EISCAT Headquarters where a file of EISCAT publications will be kept.

6. DISTRIBUTION OF EISCAT DATA

- 6.1. Common programme data will be processed by the EISCAT analysis programs yielding tabulations of ionospheric parameters.

- 6.2. Processed common programme data will be dispatched by EISCAT (or its contractor) to the Associates on magnetic tape, one set per country. Release of such data on a non-collaborate basis to third parties must be approved by the Director, who will act in consultation with SAC and report in retrospect to Council.
- 6.3. Magnetic tape copies of raw data from Common Programme experiments may be obtained from EISCAT's contractor for data distribution. Magnetic tape copies of particular programme data will be provided upon request to the particular Associate by EISCAT.
- 6.4. Particular programme data capable of being processed by the standard EISCAT programs will be thus processed with the minimum practicable delay if requested by the Associate(s) responsible for the programme.
- 6.5. Other particular programme data will be processed by EISCAT if the necessary analysis programs are devised by the experimenter assisted by EISCAT staff. Otherwise the experimenter will receive raw data on magnetic tape.
- 6.6. All particular programme data will become available on request from scientists in all EISCAT member countries one year after acquisition.
- 6.7. The Director shall have discretion to make available to any scientist a limited amount of common programme data needed to supplement other scientific investigations. Particular and third-party programme data may be made available during the first year after acquisition with the permission of the experimenter.
- 6.8. Brief descriptions of all common, particular and third-party programmes will be published by EISCAT. A summary of observations shall be published in the EISCAT Annual Reports.
- 6.9. EISCAT will securely archive one set of all EISCAT data. Experimenters may remove only copied data from EISCAT.

COMMON PROGRAM EVOLUTION

Common Program 0 (CP-0)

<u>Version</u>	<u>Waveform</u>	<u>Tromsö</u>	<u>Remotes</u>	
D,E,F,G,H	360 μ s pulse	ACF	ACF	125 pps
	60 μ s pulse	PP		125 pps
I	360 μ s pulse		ACF	125 pps
	360 μ s pulse	ACF	ACF	125 pps
	60 μ s pulse	PP		125 pps
	20 μ s pulse	PP		125 pps

Pointing

<u>Version</u>	<u>Tromsö</u>		<u>Remote heights</u>	<u>cycle time (min)</u>
	<u>Az,</u>	<u>El</u>		
D,E,F	179.8	77.16	300 km	--
G	179.7	76.5	300 km	--
H	179.7	76.5	312 km	--
I	179.7	76.5	312 km	--

ACF - indicated pulse used for autocorrelation function measurement

pp - indicated pulse used for power profile measurement

Common Programs -1 and 1 (CP-M1 and CP-1)

<u>Version</u>	<u>Waveform</u>	<u>Tromsö</u>	<u>Remote</u>	<u>Repetition freq.</u>
M1-B	500 μ s	ACF	ACF	71.4 pps
M1-C	500 μ s	ACF	ACF	100 pps
1-C, 1-D	360 μ s		ACF	80 pps
	360 μ s	ACF	ACF	80 pps
	5x15 μ s	multipulse ACF		80 pps
	5x15 μ s	multipulse ACF		80 pps
	60 μ s	PP		80 pps
	15 μ s	PP		80 pps
1-F	360 μ s		ACF	111 pps
	360 μ s	ACF	ACF	111 pps
	4x20 μ s	multipulse ACF		111 pps
	3x20 μ s	multipulse ACF		111 pps
	60 μ s	PP		111 pps
	20 μ s	PP		111 pps

Pointing

<u>Version</u>	<u>Tromsö</u>		<u>Remote</u>	<u>cycle time</u>
	<u>Az</u>	<u>El</u>	<u>height(s) - km</u>	
M1-B,C	180.5	77.6	110, 120, 130, 140, 300, 700	10 min
1-C	181.6	76.5	110, 312	10 min
1-D	181.6	76.5	99, 108, 119, 130, 312	10 min
1-F	181.7	76.5	101, 110, 119, 131, 312	10 min

Common Program -2 and 2 (CP-M2 and CP-2)

<u>Version</u>	<u>Waveform</u>	<u>Tromsö</u>	<u>Remote</u>	<u>Repetition freq.</u>
M2-B,C,D	360 μ s	ACF	ACF	125 pps
	60 μ s	PP		125 pps
2-B	360 μ s	ACF	ACF	125 pps
	360 μ s		ACF	125 pps
	60 μ s	PP		125 pps
	20 μ s	PP		125 pps

Pointing

<u>Version</u>	<u>Tromsö</u>		<u>Remote height</u>	<u>cycle time</u>
	<u>LAT</u>	<u>LONG</u>		
M2- B,C	69.2	19.2	300	6 minutes
	68.4	19.2	300	
	68.4	21.1	300	
M2- D	69.2	19.2	312	6 minutes
	68.4	19.2		
	68.4	21.1		
2-B	69.2	19.2	312	6 minutes
	68.4	19.2		
	68.4	21.1		
	68.9	19.2	(parallel to B)	

Common Programs -3 and 3 (CP-M3 and CP-3)

<u>Version</u>	<u>Waveform</u>	<u>Tromsö</u>	<u>Remote</u>	<u>Repetition freq.</u>
M3-A	360 μ s	ACF	ACF	125 pps
	60 μ s	PP		125 pps
M3-B	1000 μ s		ACF	80 pps
	320 μ s	ACF		80 pps
	60 μ s	PP		80 pps
3-A, 3-B, 3-C	1000 μ s		ACF	80 pps
	360 μ s	ACF		80 pps
	60 μ s	PP		80 pps

Pointing

<u>Version</u>	<u>Tromsö</u>		<u>Remote height</u>	<u>cycle freq.</u>
	<u>Az</u>	<u>El</u>		
M3-A (3 pos.)	180	93.0	300	6 minutes
	180	77.2	300	
	180	61.4	300	
M3-B (11 pos.)	<u>LAT</u>	<u>LONG</u>	325	20 minutes
	72.25	20.00		
	71.75	20.27		
	71.25	20.55		
	70.75	20.84		
	70.25	21.14		
	69.75	21.44		
	69.25	21.74		
	68.75	22.05		
	68.25	22.36		
3-A, 3-B (16 pos.)	74.25	18.92	325	30 minutes
	73.25	19.46		
	72.25	20.00		
	71.75	20.27		
	71.25	20.55		
	70.75	20.84		
	70.25	21.44		
	69.75	21.44		
	69.25	21.74		
	68.75	22.05		
	68.25	22.36		
	67.75	22.67		
	67.25	22.98		
66.25	23.60			
65.25	24.22			
64.25	24.84			

3-C

(15 pos.)

74.2 14.6
 73.2 15.8
 72.3 16.8
 71.5 17.6
 70.8 18.2
 70.2 18.7
 69.6 19.2
 69.0 19.6
 68.4 20.0
 67.9 20.4
 67.3 20.8
 66.7 21.2
 66.0 21.6
 65.2 22.0
 64.2 22.5

325

30 minutes

NATIONAL REPRESENTATIVES FOR EISCAT ASSOCIATE COUNTRIES

	<u>National Coordinator</u>	<u>Scientific Advisory Comm.</u>
<u>France</u>	G.Caudal CRPE 4, Ave.de Neptune F-94107 St.Maur Cedex	D.Alcayde CESR 9, Ave.Colonel Roche F-310 29 Toulouse W.Kofman CEPHAG B.P.46 F-38402 St.Martin d'Herès
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<u>West Germany</u>	H.Kohl same address	K.Schlegel MPI für Aeronomie Postfach 20 D-3411 Katlenburg-Lindau W.Baumjohann MPI für Extraterr.Physik D-8046 GARCHING bei München

Catalog of Observations, 1981-19831981 Observations

START-UT		END-UT		EXPERIMENT NAME
YYMMDD	HHMM	YYMMDD	HHMM	
810820	1545	810820	2115	CP-M1-B
810916	0900	810917	0715	CP-M1-B
810923	0930	810924	0800	CP-M1-B
810930	1130	811001	0900	CP-M1-C
811002	0825		1058	CP-M1-C
811006	2200	811007	0738	CP-M1-C
811007	0846	811008	0900	CP-M1-C
811014	1415		1532	CP-M1-C
	1737	811015	0900	CP-M1-C
811021	0910		1452	CP-O-D
811022	0745		0900	CP-O-D
811025	1640	811026	0900	CP-O-E
811104	0930	811105	0900	CP-O-E
811111	0900		1454	CP-O-F
811118	0900		1016	CP-O-F
	1111	811119	0900	CP-O-F
	1854		2000	SP-GE/UK-EB1
811123	2004		2327	SP-GE-STAGE
811125	0901	811126	0034	CP-M2-B
811126	0050		0130	SP-GE-EB1
	0149		0844	CP-M2-B
	1734		2300	SP-GE-STAGE
811129	1000	811130	0100	CP-M3-A
811130	0215		1000	CP-M3-A
811201	1530		1620	SP-UK-EB2
	1714	811202	0150	SP-GE-STAGE/EB3
811202	0800		1314	SP-FR-CPM3
811203	1640	811204	0130	SP-GE-EB3/STAGE
811205	1110		1650	SP-FR-CPM3
811206	1450		1650	SP-GE/FR-PLH1
811207	1000		1730	SP-UK-SPITS
811208	0910		1354	SP-GE/FR-PLH1
	1500		1620	CP-M3-B
	1840	811209	0648	CP-M3-B
811209	1645		1842	SP-UK-EB3
	1900		2018	CP-M3-B
	2040		2300	SP-GE-EB3
811210	1300		1400	SP-GE/FR-PLH1
811211	1222		1413	SP-GE/FR-PLH1
811214	0930		1200	SP-UK-SPITS
	1213		1350	SP-GE/FR-PLH1
811215	1500	811216	1254	CP-M3-A
811216	1345		1444	SP-UK-EB3
	1500		1934	CP-M3-A
811217	0750		1000	SP-UK-SPITS
	1055		1156	SP-GE/FR-PLH2
	1500		2300	SP-UK-SKSP1
811218	0000		0115	SP-UK-SKSP1

1982 Observations

START-UT		END-UT		EXPERIMENT NAME
YYMMDD	HHMM	YYMMDD	HHMM	
820119	1640		2400	CP-M3-A
820120	1500		2300	CP-M3-A
820125	1302		1522	SP-FR-EC
	2027	820126	0346	SP-FR-PLASMANIGHT
820126	1500	820127	2258	CP-3-A
820131	1000	820201	0100	CP-3-A
820414	1302		1332	CP-O-G
	1403		2301	CP-O-G
820415	0234		0305	CP-O-G
	0705		0835	CP-O-G
	1800		2400	SP-UK-DE/HA
820419	1800		2100	SP-UK-DE
	2130		2400	SP-UK-HA
820421	1000		1300	CP-M2-C
820425	1210	820426	1000	CP-3-A
820505	1220		2124	SP-FI-SPSU
820506	0000		0920	SP-FI-SPSU
820509	1018	820510	1003	CP-O-G
820512	1756		2356	CP-3-B
820518	0930		1430	SP-FR-MI
	1630	820519	2300	CP-M2-C
820520	0900		1400	SP-FR-MI
	1759		2359	CP-3-B
820526	1000	820527	1000	CP-3-B
820602	1000	820603	1000	CP-O-G
820603	1100		1300	SP-UK-SKSP1
820606	1000	820607	1200	CP-M2-C
820616	1100	820617	1100	CP-3-B
820707	1100	820708	1000	CP-M2-C
820714	1402	820715	0642	CP-M2-AURORA
820715	1410		1952	CP-M2-AURORA
820726	1200		1320	CP-3-B
	1345		1415	SP-UK-SPORE
	1500		2355	SP-FR/GE/SW/UK-CAMP
820727	0000		0133	CP-3-B
	1200		1342	CP-3-B
	1400		1827	SP-FR/GE/SE/UK-CAMP
	2206		2300	SP-FR/GE/SW/UK-CAMP
	2315	820728	0200	CP-3-B
820728	1200		1328	CP-3-B
	1548		1810	SP-FI/SW/UK-SPORE
	1835		2255	SP-FR/GE/SW/UK-CAMP
820729	1016		1135	SP-FR/GE/SW/UK-CAMP
	1230		1606	SP-UK-POL/NOR
	2100		2330	SP-FR/GE/SW/UK-CAMP
820730	0830		0945	SP-UK-POL
	1000		1115	SP-FR/GE/SW/UK-CAMP
	1230		2125	SP-FI/SW/UK-SPORE

820731	0000		0158	CP-3-B
	1016		1150	SP-FR/GE/SW/UK-CAMP
	1200		1352	CP-3-B
	1405		2005	SP-FI/SW/UK-SPORE
	2130		2315	SP-FR/GE/SW/UK-CAMP
820801	1000		1145	SP-FR/GE/SW/UK-CAMP
	1200		1358	CP-3-B
	1410		1805	SP-FI/SW/UK-SPORE
	2105		2300	SP-FR/GE/SW/UK-CAMP
820802	1000		1140	SP-FR/GE/SW/UK-CAMP
820803	1004		1145	SP-FR/GE/SW/UK-CAMP
820804	1000		1145	SP-FR/GE/SW/UK-CAMP
	1200	820805	0945	CP-M2-C
820805	1000		1145	SP-FR/GE/SW/UK-CAMP
	1240		1947	SP-FI/SW/UK-SPORE
820806	1410		1530	SP-FR/GE/SW/UK-CAMP
	2100		2200	SP-FR/GE/SW/UK-CAMP
820807	1000		1140	SP-FR/GE/SW/UK-CAMP
	2100		2245	SP-FR/GE/SW/UK-CAMP
820808	1000		1130	SP-FR/GE/SW/UK-CAMP
	2100	820809	0100	SP-FR/GE/SW/UK-CAMP
820809	0835		0940	CP-O-G
	1000		1130	SP-FR/GE/SW/UK-CAMP
	2114		2254	SP-FR/GE/SW/UK-CAMP
820810	0515		0654	SP-UK-POL
	1000		1132	SP-FR/GE/SW/UK-CAMP
	1200		2100	SP-FI/SW/UK-SPORE
	2115		2300	SP-FR/GE/SW/UK-CAMP
820811	1000		2319	CP-O-G
	2325	820812	0100	SP-FR/GE/SW/UK-CAMP
820812	0115		1000	CP-O-G
	1045		1357	SP-UK-RPL
	1413		1620	SP-FI/SW/UK-SPORE
820813	1015		1400	SP-UK-RPL
820814	0500		1000	SP-UK-POL
820817	1100		2130	CP-M2-C
	2330	820818	0857	CP-M2-C
820818	0930		1100	CP-M2-C
821121	1948		2028	SP-GE/NO-HERO
821124	1421		1750	CP-O-H
821125	1000	821126	1000	CP-O-H
821126	2139		2300	SP-UK-SKSP3
821127	1205		1235	SP-GE/NO-HERO
	1400		1522	SP-UK-POL
821128	0744		0832	SP-GE/NO-HERO
	1358		1503	SP-UK-POL
	1600		1800	CP-3-B
821129	1144		1220	SP-GE/NO-HERO
	1246		1353	CP-M2-C
	2059	821130	0036	SP-UK-SKSP3
821130	1039	821201	1000	CP-O-H
821202	0700		0758	SP-UK-NOR
821204	1702		1746	SP-SW-GEOS
821214	1300		1828	CP-3-B
	1932		2000	CP-3-B
	2030		2358	CP-3-B

1983 Observations

START-UT		END-UT		EXPERIMENT NAME
YYDDMM	HHMM	YYDDMM	HHMM	
830107	1600		1921	SP-UK-POLA
830111	1000		2359	CP-O-H
830112	0040		2155	CP-O-H
830113	1942		2156	SP-UK-AUSL
	2322	830114	0457	SP-UK-AUSL/SOUT
830114	1815	830115	1414	SP-UK-AUSL/SPZ
830115	1642		2334	CP-O-H
	2350	830116	0059	SP-UK-POLA
830116	0855		1520	SP-UK-SPZ
	1527		1644	CP-O-H
	1704		1732	SP-FR-MP
	1735		1905	CP-O-H
830117	1737		1905	CP-O-H
830128	1200		1430	SP-FR/GE/NO-PLH/HEAT3
830622	1000		2029	CP-O-H
	2100	830623	1000	CP-O-H
830629	1000	830630	0831	CP-3-C
830713	1000	830714	0957	CP-3-C
830720	0800	830721	2400	CP-M2-D
830802	0836		0915	CP-O-H
	1037		1559	CP-O-H
	1636		2333	CP-O-H
830803	0634		1000	CP-O-H
830804	1352		1435	CP-O-H
	1754		1904	SP-FR-MP
830805	0751		0843	CP-O-H
	0939		1117	SP-FR-MP
830809	1024	830810	1057	CP-3-C
830811	0850		0909	SP-FI-EFOR
	1006		1138	SP-FI-ECFO
	1346		1802	SP-FI-ECFO/EFLA/EFOR
830812	1033		1138	SP-FI-ESLA/ECFO
	1159		1253	SP-FI-EFOR
	1331		1730	SP-FI-GRAV
830816	0920	830817	2257	CP-3-C
830825	1304		2316	CP-O-H
830826	0000		1006	CP-O-H
830830	1047	830831	1000	CP-O-H
830902	1034		1141	SP-GE-HERO
830920	1454		1539	SP-GE-HERO
	1541		1945	SP-GE-ARC/MAGC
	1949		2123	SP-UK-POLA/AGWL/SOUT
830921	1242		1335	SP-GE-HERO
830922	1100		1146	SP-GE-HERO
	1214		1508	SP-FR/GE/NO-PL4
	1559	830923	0412	SP-UK-SOUM
830923	1624		2035	SP-UK-AGWL

830924	1230		1235	SP-FR/GE/NO-PL4
	1252		1342	SP-GE-HERO
	1346		1357	SP-GE-ARCO
	1430		1443	SP-FI-ESLA
	1514		2200	SP-FI-EFOR
	2240		2302	SP-FI-UNICAL
830925	0552	830926	0203	SP-UK-POLA
830926	0710		1022	SP-UK-AGWW
	1734		2202	SP-UK-SUOM
830927	0733		0936	SP-UK-TOPS/AGWL
	1223		1404	SP-FR/GE/NO-PL5
	1520		1603	SP-FR/GE/NO-PL5
830928	1114		1302	SP-FR/GE/NO-PL5
	1304		1317	SP-GE-HERO
831003	1715		2154	SP-GE-ARCO
831004	1000		1856	CP-3-C
	1902		2008	SP-GE-ARCO
	2040	831005	2400	CP-3-C
831006	1913		2200	SP-GE-ARCS
831007	1257		1422	SP-GE-HERO
	1424		1455	SP-FR/GE/NO-PL5
	1650		2200	SP-GE-ARCO/CP3C
831008	1807		1939	SP-GE-HLAT
	1944		2152	SP-UK-PC182/PC4
831009	1557		2338	SP-GE-HLAT
831010	1533		2150	SP-GE-HLAT/ARC1
831011	1015	831012	0945	CP-3-C
831912	1205		1517	SP-NO-FACF/MUL5
	1701		2148	SP-NO-FACF/MUL5
831013	1018		1658	SP-NO-FACF/MUL5
	1702		2200	SP-GE-HLAT
831014	1052		1357	SP-NO-FACF/MUL5
	1501		2205	SP-GE-HLAT
831017	1652		2331	SP-NO-TANP/RESO
831018	1000	831019	0957	CP-O-H
831019	1030		2256	SP-NO-TANP/RESO/PSMO
831020	0800		2130	SP-NO-TANP
831021	1020		1530	SP-NO-TANP/RESO
831030	1803		2033	SP-NO-TANP
	2137		2400	SP-NO-POWM
831101	1000		1427	CP-3-C
831103	1845		2232	SP-SW-JOUL/IVEL/NWIN
	2256		2337	SP-SW-IONC
831104	0839		1453	SP-FR-FR17
	1500		2051	SP-SW-IVEL/NWIN
831105	1859		2025	SP-NO-LEAP
	2045		2132	SP-FR-ECSIM/CP3E
	2157		2212	SP-FR-MU12
831107	1530		1740	SP-SW-JOUL
	1900		2400	SP-FR-ECSIM
831108	0032		0112	SP-FR-ECSIM
	1000		1357	CP-M2-D
	1400		1429	CP-O-H
831109	0406		1000	CP-M2-D
	1000		1200	CP-O-H
	1210		1238	SP-FR-MU4
	1500	831110	0405	SP-SW-IVEL

831110	0800		1750	SP-FR-EDIA/CP3E/SRHL
	1800	831111	0402	SP-SW-JOUL
831111	0800		2055	SP-FR-ECSIM/SRHL
	2109		2200	SP-NO-LEAP
	2212	831112	0400	SP-FR-MU12
831112	1644		2059	SP-FR-SRHL
831114	1044	831115	1221	CP-3-C
831115	1335		1605	CP-3-C
	1854		2127	CP-3-C
831116	1538		2240	SP-FI-ESLA/MESO
831117	0807		1029	SP-EI-MVAD/EFOR
	1030		1112	CP-O-I
	1113		1149	SP-EI-MVAD/EFOR
	1604	831118	0622	SP-FI-ESLA/EFOR
831128	0946		1127	SP-FR-SRHL/MU1/MU12
	1512		2202	SP-FR-SRHL/MU1/MU12
	2208		2306	SP-GE-EFOR
831129	0000		0235	SP-FR-MU1
	1000	831130	1000	CP-O-H
831130	1006		1758	SP-FR-ECSIM
	1811		2231	SP-GE-EFOR
831201	0359		0414	SP-FR-CP3E
	0858		1106	SP-FR-ECSIM
	1548		2331	SP-FR-CP3E
831202	0000		0827	SP-FR-CP3E
	0957		1022	SP-FR-CP3E
	1157		1657	SP-FR-CP3E
	1708		2141	SP-GE-EFOR
831204	1558		2113	SP-UK-NORT
831205	1013		1018	SP-FR-ECSIM
	1043		1433	SP-FR-ECSIM
	1458		2400	SP-UK-FRQN/EFIR
831206	0058		0738	SP-UK-FRQN/NORT
	0928		1413	SP-FR-ECSIM
	1500	831207	1505	CP-O-H
831207	1630		2023	SP-EI/FI/FR/GE/NO/UK- MLTH1
	2028		2317	SP-GE-EFOR/STRT
831208	0813		0833	SP-FR-MESO/MUI5/MU2
	0836		0854	SP-EI-DREGSPEC/MESO1
	0856		1941	SP-FR-MESO/MU15/MU2
831209	0617		1346	SP-FR-MU2/SRHL
	1758		2145	SP-GE-EFOR
	2200	831210	1420	SP-FR-CP3E
831212	1258		1457	SP-UK-FRQ2
	1513		2201	SF-FR-MESO/MU2
831213	0315		0351	SP-FR-MESO/MU2
	0400		0834	SP-UK-FRQ2
	0900	831214	0900	CP-3-C
831214	1131		1155	SP-EI/FI/FR/GE/NO/UK- MLTH1
	1200		1500	SP-UK-FRQ2
	1558		1815	SP-UK-MESO/FRQ2
	1815		1911	SP-EI-DREGSPEC
	1913		2340	SP-UK-FRQ2/SRHL
831215	1027	831216	0652	SP-FR-EDIA/CP3E/SRHL
831216	1357		1915	SP-FR-EDIA
	2010	831217	0252	SP-FR-EDIA/MU4/CP3E

