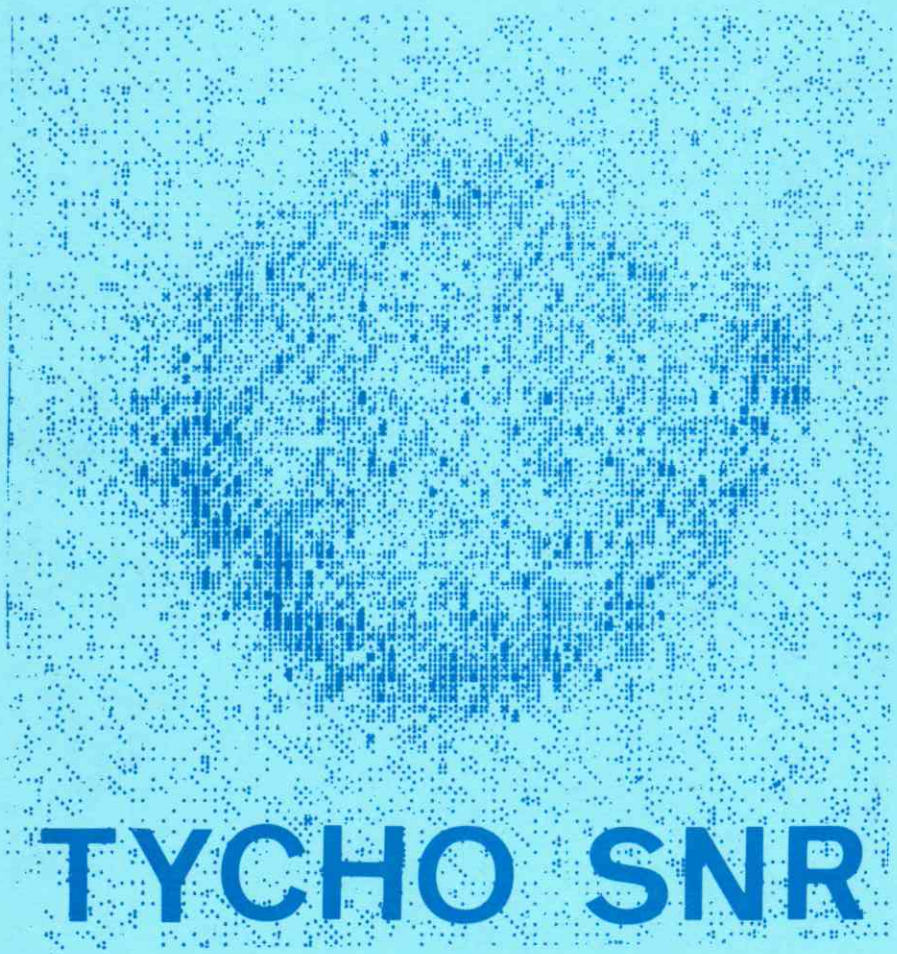
exosat esa

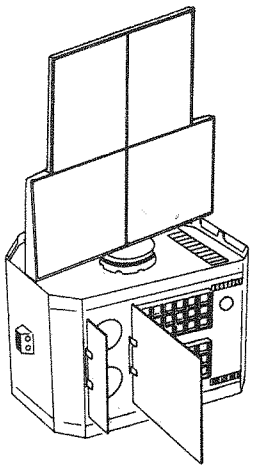
EXOSAT EXPRESS



TYCHO SNR

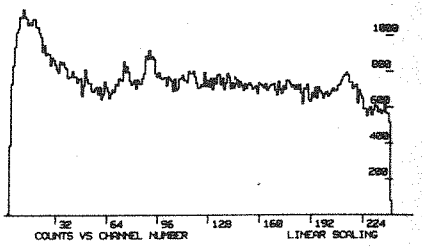
EXOSAT
EUROPEAN X-RAY
ASTRONOMY SATELLITE

NO. 1 OCTOBER 1983



esa

EXOSAT EXPRESS



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No.1 October 1983

FOREWORD

This is the first issue of the EXOSAT EXPRESS, a newsletter which we intend to distribute at approximately two-monthly intervals. The intention of the EXPRESS is to inform the scientific community at large (we have a mailing list in excess of six hundred) of the latest status of the mission, the observing programme, happenings at the Observatory at ESOC, scientific results, etc., etc.

The framework of a first issue was established within a few days of launch, but because of the high pressure to get EXOSAT operational and start its observing programme, the production of the EXPRESS was inevitably, and hopefully understandably, not accorded top priority. Indeed this first issue is rather to get the ball rolling.

The EXPRESS will be produced at ESOC under the editorial responsibility of the Observatory Manager, Dr David Andrews. Should readers have comments on the content or indeed if they would like to have short articles published under their name in the EXPRESS, please send them to:

Dr. D. Andrews,
EXOSAT Observatory,
ESOC,
Robert Bosch Straße 5,
61 Darmstadt,
West Germany.

STATUS OF PROGRAMME AS OF 1ST OCTOBER 1983

EXOSAT was launched on May 26th. Switch-on of the instruments and initial checkout was completed by June 18th. Instrument calibration and performance verification was largely completed by August 15th. The observing programme proper, ie. the undertaking of observations selected by the COPS (Committee for Observation Proposal Selection) from the response to AO1 issued in the summer of 1981, was then started.

Hardware

EXOSAT, ESA's first X-ray astronomy satellite, though conceived as early as 1969 and selected in 1973, is intended to make a major contribution in furthering this branch of astronomy following, as it does, the pioneering missions of the early '70s and the operation of the Einstein Observatory. In order to do this within various boundary conditions, such as a mass limit on the satellite of 500 kg, the spacecraft and scientific instruments are highly sophisticated and employ advanced technologies, many of them representing the ultimate in the 'state of the art'. Perhaps then it was not entirely inconceivable that there would be some teething problems in the early operational phase, despite the thorough ground testing and calibration of spacecraft and instruments. It is now possible to put these problems into perspective, and hopefully lay to rest some of the rumours and speculation that abounded during the early orbit phase.

Difficulties were experienced with operation of the attitude control system but refined operational procedures have led to a marked reduction in the anomalous behaviour. It is estimated that up to 0.75 kg of control gas out of 14 kg total was wasted through this behaviour. However, assuming that operations continue as of now, there should be no shortage of attitude control gas before orbit decay and satellite re-entry. Targets are acquired to typically 1 arcmin without trimming, and pointing is maintained to within a few arc sec.

PSD's

Of the two position sensitive proportional counters (one to each telescope), one exhibited anomalous behaviour on initial switch-on and has not yet been reactivated. No clue has emerged as to why this occurred. The second was operated for a considerable period before it too started to behave anomalously. Analysis of the data has indicated a gradual build-up of low energy pulses in the detector. It is possible that the rate of this build-up can be reduced by operating at lower high voltage settings, hence lower gas gain. Reactivation and investigation of this detector at new settings is now planned for early October.

Implementation of optimum settings and operational procedures now ensure fully satisfactory operation of sixteen proportional counters of the medium energy experiment, the two channel multiplier arrays of the imaging telescopes and the gas scintillation spectrometer.

Because of a partial jamming of the mechanism that erects the transmission grating on telescope number 1, only the grating on telescope number 2 is now being used.

Performance and Operations

Tables 1 and 2 give the current performance parameters of the EXOSAT instruments. A major surprise from the early orbit phase was the much lower than predicted non X-ray background in the medium energy detectors and the gas scintillator. Indeed the background rates for these detectors in EXOSAT's high 200.000 km apogee orbit is comparable with those for a low earth orbit. Thus the main apparent disadvantage of the high orbit has disappeared while the telemetry rate of 8 kbps, given the flexibility of the on-board computer, is not a very limiting factor.

The advantages of the high orbit are then immediately apparent. EXOSAT can be operated in real time continuously for about 80 hours per orbit without earth obscuration of the celestial target. This means for example that the light curves of binaries can be followed uninterrupted for many cycles. It also means that real time decisions to change experiment mode, insert different filters or the grating can be taken on the basis of data received as the observation proceeds.

The flexibility of the EXOSAT system (both satellite and ground observatory) has been fully exercised to cope with changes to the hardware status and has been well demonstrated by the fact that of the observations to be conducted on A01 approved proposals, some 60% are correlated with either ground-based telescopes and/or the space observatories IUE and IRAS. The flexibility has also been demonstrated in undertaking observations of targets of opportunity such as Supernova Evans.

During the calibration and performance verification phases, 60 targets were observed. Since the A01 programme was implemented 104 targets have been observed and of the 199 proposals accepted from A01 (many with several targets) 66 have been completed or partially completed.

On-board Software

Considerable modifications to the on-board computer (OBC) software, both system and application programs, have been implemented immediately prior to and post launch, in response to ground calibration measurements, early orbit instrument performance, X-ray background variability and errors in the original software. All changes propagate through the entire observatory ground system as minor or major modifications to telemetry handling, real-time data display, data filing and archiving, off-line analysis, final observation tape (FOT) production, and of course, documentation. The following payload data processing programs (application programs) have been modified:

GSPC Energy Histograms (GHEBL4):

Compression of 256 channel histograms to 128, 64, 32 or 16 channels. Inclusion of burst length filters

GSPC Direct Mode (GDIR):

New program to accumulate per photon, energy channel and time of arrival to an accuracy of the sampling selected.

ME Energy Resolution (MHER4):

Background and source energy histograms using detector ID word, and for the half experiment mode, channel compression and selection.

ME Pulsar Mode (MPULS2):

Background and source histograms as a function of phase.

LE Direct Mode (LDIR1/LDIR2):

Addition of 'diamond-shaped' position filter. Selection of data on valid position or energy. Removal of rise time data to give an energy/position mode (telemetry saving).

LE Background monitoring:

New definition: flare mode deleted, because background variability precluded a sensible algorithm definition.

Further changes to LE/ME application programs are in progress and will be reported in the next issue(s) of the EXPRESS.

Observation Output

A major task has been the determination of the calibration of the many detectors to produce data available for issue with the observational data on the Final Observation Tapes (FOT). As of the beginning of October 600 FOTs were required from the calibration and performance verification phases. Of these 550 have been produced and 450 despatched to the so-called hardware institutes. FOT production for the AO1 targets has just begun. Clearly we have a back-log on AO1 of something in excess of seven weeks at this moment, but strenuous efforts are being and will continue to be made to bring the issue of the FOTs and the automatic scientific analysis output back to the planned four weeks after observation.

Real time output from the EX2 graphics system is available to the observer as the observation proceeds and allows decisions to be taken in the light of this 'quick look' data on the experiment configuration/OBC modes eg. filter use, time resolution etc. Hard copy of images and histograms together with tables in raw data form can be provided, but there is no general facility available at the Observatory for more detailed scientific analysis of the quick look data, which has therefore to await the FOT and automatic analysis output.

Future Plans

Following the problems encountered with the PSDs, 50 proposals, in which the PSD played a prime role (of the 199 from AO1) were deferred pending the resolution of the problems. Should the PSDs prove operable but at lower performance and perhaps with limited lifetime, the COPS will be invited to group these proposals in order of scientific priority and they will be time-lined accordingly. Should the proposals be ranked with low priority or should the PSDs remain inoperable, then those still deferred proposals should be resubmitted in responsee to AO2. As things presently stand, responses to AO2 must assume the worst, ie. PSDs inoperative, but indicate how the proposed scientific investigation would be enhanced should they be available.

It is presently anticipated that the AO1 accepted observation proposals (less the 50 PSD prime proposals) will require until approx. February 1984 to complete. In this case AO2 will be issued in late October or early November with a six week response time. The AO2 will not be released earlier since work is still going on updating the Observers Handbook etc., in the light of the actual performance in orbit.

Some criticism has been received on the short-notice observers have been given regarding the time-lining of their observation. Rest assured that we want to give the principal investigators (only) as much notice as possible. However, with the rather dynamic situation that has prevailed with regard to the satellite's hardware, in particular the grating mechanism jamming in late September, time-lining has had to be equally dynamic. We would rather not issue a time-line unless we have good confidence that we can stick to it.

TABLE 1

PERFORMANCE CHARACTERISTICS (LE)

Low Energy Experiments	Characteristics/Telescope		
Energy Range	0.04-2 keV (6-300 A) CMA's*		
Energy resolution	Five filters are available for broad-band spectroscopy		
Field of view	2.2° diameter		
Effective area (cm^2) (LE1)	Thin Lexan Filter	Al/P Filter	Boron Filter
.05 keV	0.2	0.3	-
.1 keV	4.0	1.5	-
.5 keV	0.8	1.0	-
1 keV	2.0	2.0	1.2
1.5 keV	2.0	2.0	1.8
2.0 keV	0.5	0.5	0.5
Spatial resolution (Line spread function HEW)			
On axis	~18 arc seconds		
20 arc minutes off-axis	~40 arc seconds		
Average steady residual background**	1.8 cnts/sec/cm^2 (LE1) 2.8 cnts/sec/cm^2 (LE2)		
Grating	A 500 lines/mm grating is available for high resolution spectroscopy on LE2		
	$\Delta\lambda$ = 1 Å ($\lambda \leq$ 40 Å) and 5 A for λ = 300A		

* Subject to UV contamination between 900 - 2600 A

** Background rate subject to flaring

TABLE 2

PERFORMANCE CHARACTERISTICS (ME & GS)

Medium Energy Experiment	Characteristics
Total effective geometric area	1800 cm^2 (all quadrants co-aligned)
Effective energy range	1-20 keV (Argon proportional counters) 5-50 keV (Xenon proportional counters)
Energy resolution ($\Delta E/E$)	$51/E\ (kev)^{1/2}$ (Argon counters) % FWHM 18% for 10 keV$\leq E \leq$30 keV (Xenon counters)
Field of view	45 arc minutes FWHM, triangular response with a 3' flat top
Total residual background	4 cnts/sec/keV (2-10 keV Argon counters co-aligned)
Gas Scintillation Counter (GSPC)	
Total effective geometric area	160 cm^2
Effective energy range	2-18 keV or 2-40 keV, depending on gain setting
Energy resolution ($\Delta E/E$)	$27/E\ (kev)^{1/2}$ % FWHM
Field of view	45 arc minutes FWHM triangular response with a 3' flat top
Total residual background rate	1.3 cnts/sec/keV (2-10 keV)

CALIBRATION/PV PHASE OBSERVATIONS: 14.6.83 - 17.8.83

Day	Time	Target	RA	Dec	SAA	Duration h m	Comments
165	16.17	Denebola	11 44 44	+14 38'38		2 45	
166	12.30	Blank Field	13 06 15	+29 39'00		50 1	
170	20.23	Cygnus X-1	19 52 29	+35 03'00	114	2 15	
170	23.48	Cygnus X-1 -30'	19 54 29	+35 03'55	114	8 14	
171	09.10	Cygnus X-1 -3'	19 55 29	+35 03'55	114	7 20	
171	17.40	Cygnus X-1 -3'	19 56 17	+35 03'55	114	19 57	
173	05.56	Cygnus X-1 -3'	19 56 17	+35 03'55	114	1 33	
173	12.15	Cas A	23 21 00	+58 32'30	75	30 25	
174	20.52	N. Polar Spur	17 05 43	+04 43'57	148	8 47	
175	09.34	1837+049	18 37 30	+04 59'20	89	9 5	
175	22.28	1758-205	17 58 21	-20 31'58	176	6 27	
176	08.02	Vega	18 35 02	+38 44'09	117	4 38	
177	15.45	1E1145-616	11 45 50	-61 40'43	106	9 25	
178	05.32	SNR1209	12 09 11	-52 30'00	106	11 28	
178	17.21	SNR1209	12 09 44	-52 30'00	106	4 47	
179	00.30	Her X-1	16 56 02	+35 25'05	117	8 20	
179	11.00	HZ43	13 13 48	+29 22'00	88	11 59	
180	01.01	AM Her	18 14 46	+49 50'55	106	6 27	
180	18.22	AM Her	18 14 46	+49 50'55	106	19 14	
181	15.05	Her X-1 Re-visit	16 56 01	+35 25'05	117	4 27	TOO*
181	21.30	M31	00 39 48	+40 58'59	74	55 48	
184	12.31	M31	00 39 48	+40 58'59	74	1 59	
184	19.58	Cyg X-3	20 30 26	+40 47'13	111	32 8	
186	06.26	Cyg X-2 (Raster)	21 45 20	+37 37'52	107	24 36	
187	11.24	Supernova Evans	13 34 18	-29 37'00	107	18 36	TOO
188	06.10	Supernova Evans	13 34 18	-29 35'26	108	9 3	TOO
188	18.18	1E1145-616	11 45 02	-61 40'33	100	4 39	
188	23.29	4U1145-52	11 45 34	-61 55'44	101	4 30	
189	07.58	Ton 256	16 12 09	+26 11'46	115	4 45	
189	14.52	Her X-1	16 56 02	+35 25'05	114	26 6	TOO
190	18.54	PSR1937+214	19 37 29	+21 28'29	135	29 47	
192	01.47	PSR1937+214	19 37 29	+21 28'29	135	2 3	
192	05.33	NGC 4151	12 06 48	+39 46'40	62	6 11	
192	12.38	NGC 4151	12 08 00	+39 41'00	62	33 52	
194	00.25	Virgo A	12 18 30	+13 00'00	61	13 35	
194	15.54	Virgo B	12 21 30	+13 00'00	69	8 16	
195	01.15	Virgo C	12 24 00	+13 00'00	69	3 11	
195	05.28	Virgo D	12 27 00	+13 00'00	70	13 31	
195	19.30	Virgo D	12 27 00	+13 00'00	70	2 35	
195	22.55	Virgo E	12 30 00	+13 00'00	70	3 58	
196	03.37	Virgo F	12 33 03	+13 05'03	70	2 23	
196	06.27	Virgo F	12 33 00	+13 00'00	70	8 33	
196	15.52	Virgo G	12 36 00	+13 00'00	71	14 50	

Day	Time	Target	RA	Dec	SAA	Duration h m	Comments
197	08.17	Coma Cluster	12 57 29	+28 11'24	71	14 53	
198	01.42	GX339-4	16 59 02	-48 43'06	137	6 19	AO-1 (Illovaisky)
198	10.14	Her X-1	16 56 01	+35 25'05	110	2 45	TOO
198	17.57	2S1636-536	16 36 55	-53 39'15	132	11 24	
199	17.59	M87	12 28 46	+12 40'12	67	24 16	
200	21.58	Deep Field	18 09 53	+31 23'30	122	28 27	
202	04.42	Supernova Evans	13 34 30	-29 35'26	95	27 18	TOO
203	08.30	Supernova Evans	13 34 30	-29 35'26	95	5 30	TOO
205	11.59	NGC 1275	03 16 30	+41 20'11	64	11 38	
206	01.55	A Eri	01 35 50	-57 30'00	111	9 37	
207	11.06	A Eri	01 35 50	-57 30'00	111	1 53	
207	15.21	M31	00 39 48	+40 58'59	94	26 11	
208	19.31	LMC X-1	05 40 06	-69 46'03	93	8 26	
209	06.31	2S0114+65	01 14 42	+65 01'31	79	7 52	
209	16.13	Cyg X-1 (Offset)	19 58 30	+35 07'45	125	1 15	
209	18.41	Cyg X-1	19 56 29	+35 03'55	125	8 57	
210	05.49	Her X-1	16 56 01	+35 25'05	106	14 33	TOO
210	20.35	Her X-1	16 56 01	+35 25'05	106	4 24	TOO
211	02.50	2S1705-440	17 05 18	-44 02'13	130	8 20	
211	12.30	2S1702-429	17 02 40	-42 57'58	129	7 34	
211	22.10	EX Hya	12 49 3	-28 58'39	77	27 1	
213	02.40	Jupiter	15 53 50	-19 42'05	113	14 40	AO-1 (Schnopper)
213	19.05	1702-363	17 02 24	-36 21'23	129	20 11	
214	19.30	2S1728-337	17 28 40	-33 47'52	133	7 36	
215	04.57	H1658-298	16 58 54	-29 52'28	127	8 49	
215	15.40	GX 17+2	18 13 11	-14 03'15	142	9 2	
216	02.05	H1426+01	14 26 34	+01 30'37	83	8 14	
216	10.41	H1426+01	14 26 50	+01 30'37	83	2 56	
216	15.52	WZ Sge	20 05 20	+17 33'31	143	5 33	
217	00.10	4U 1822-00	18 22 49	-00 02'24	138	7 41	
217	11.40	Her X-1	16 56 01	+35 25'05	102	1 3	TOO
217	13.07	Her X-1	16 56 20	+35 25'04	102	26 21	TOO
218	17.43	Supernova Evans	13 34 02	-29 38'48	80	5 44	TOO
219	01.14	2S1755-338	17 55 21	-33 48'15	135	8 52	
219	11.28	1730-333	17 30 07	-33 21'17	129	2 2	
219	15.46	Sco X-1	16 17 04	-15 31'15	111	9 37	
220	01.50	Sco X-1	16 17 24	-15 25'57	111	6 9	
220	08.40	Sco X-1	16 17 23	-15 35'57	111	4 50	
220	15.55	2A 2206+542	22 06 08	+54 16'22	108	3 4	
220	21.32	3C445	22 21 15	-02 21'26	158	2 59	
221	03.22	GK Per	03 27 46	+43 44'24	76	7 00	AO-1 (Watson)
222	10.54	H 2215-086	22 15 29	-08 40'12	164	3 51	
222	17.20	AM Her	18 14 59	+49 50'54	103	20 18	
223	15.50	W 49B	19 08 45	+09 01'24	139	11 30	

Day	Time	Target	RA	Dec	SAA	Duration h m	Comments
224	05.46	A 133	01 00 18	-22 04'00	129	6 7	
224	13.54	A0851-467	08 53 48	-46 12'36	62	5 56	
224	23.20	NGC 6221	16 48 30	-59 07'59	132	3 15	
225	05.23	Her X-1	16 56 02	+35 25'03	91	4 07	TOO
226	19.50	1730-333	17 30 06	-33 21'17	111	2 30	
227	00.20	1730-333	17 31 36	-32 54'00	111	13 41	
227	14.53	1730-333	17 30 07	-33 21'17	111	4 6	
227	21.35	GK Per	03 27 46	+43 44'24	76	9 10	TOO
228	08.47	3C120	04 29 59	+05 15'00		23 53	AO-1 (Chiappetti)

* TOO = 'Target of Opportunity'

SAA = Solar Aspect Angle

AO-1 OBSERVATIONS: 17.8.83 - 9.10.83

Day	Time	Target	RA	Dec	SAA	Duration h m	Principal Investigator
229	21.45	1514-241	15 14 45	-24 11'22	89	9 28	Maccagni
230	09.25	Algol	03 04 53	+40 46'00	90	34 0	White
231	21.40	4U1223-62	12 23 50	-62 29'37	80	8 15	Re
232	07.51	NGC1316	03 23 00	-37 12'00	103	4 45	Machetto
232	14.18	NGC1360	03 31 07	-26 02'20	100	3 27	De Korte
232	19.32	Hyades Field	04 19 09	+14 19'30	81	15 19	Schnopper
233	11.22	Hyades Field	04 19 09	+14 19'30	81	2 38	Schnopper
233	15.00	T Tau	04 19 04	+19 25'04	81	2 52	Brown
233	18.58	Hyades Field	04 25 29	+15 46'29	80	4 38	Schopper
234	02.00	Feige 24	02 32 30	+03 30'59	110	9 43	Heise
234	13.00	Feige 31	03 01 59	+02 45'59	104	3 57	Heise
234	17.56	NGC 1068	02 40 07	-00 13'31	110	12 37	Lawrence
235	07.28	NGC 1090	02 43 59	-00 27'24	109	2 9	Fricke
235	11.45	FA 71	20 14 48	-57 43'00	129	5 23	Fricke
235	19.29	NGC 5506	14 10 42	-02 58'00	62	9 7	McHardy
236	07.25	GK Per	03 27 45	+43 44'24	89	13 03	TOO
238	19.25	Her X-1	16 56 02	+35 25'03	91	3 5	TOO
238	23.35	MKN 506	17 20 42	+30 55'59	97	3 30	Bleeker
239	04.26	2S1957+115	19 57 02	+11 34'15	138	6 59	Pakull
239	13.13	MSH 15-22	15 09 59	-58 56'57	90	3 49	Aschenbach
239	18.02	RCW 86	14 29 26	-62 01'59	87	4 25	Peacock
239	22.57	RCW 86	14 40 01	-62 12'00	87	5 19	Peacock
240	05.21	1543-475	15 43 49	-47 33'35	91	2 3	TOO
241	05.09	G191 828	05 48 46	+00 11'12	69	2 42	Heise
241	10.37	MSH 15-52	15 09 59	-58 56'57	99	4 28	Aschenbach
241	17.39	HD 149499B	16 34 19	-57 22'13	99	2 13	Heise
241	22.20	1617-155	16 17 04	-15 31'15	90	6 10	Peacock
242	05.05	1617-155	16 17 05	-15 29'16	90	4 55	Peacock
242	10.35	1617-155	16 17 05	-15 27'15	90	5 24	Peacock
242	16.30	1617-155	16 16 57	-15 26'54	90	2 24	Peacock
242	21.14	4U1626-67	16 27 14	-67 21'16	98	7 52	Mason
243	09.05	3A1246-588	12 46 38	-58 51'00	73	4 0	Warwick
243	14.51	40 Eri-B	04 13 00	-07 44'00	96	5 57	Heise
243	22.27	2A0316+413	03 19 10	+41 20'00	98	19 42	Branduardi
244	23.40	NGC 1685	04 50 03	-03 01'00	98	4 39	Pounds
245	07.10	MKN 1040	02 25 17	+31 05'21	114	1 33	Pounds
245	09.46	MKN 1040	02 20 20	+31 57'43	114	1 22	Pounds
245	13.55	0241+622	02 41 01	+62 15'27	96	5 9	Warwick
246	06.55	Roph (C)	16 24 00	-24 20'00	88	17 46	Montmerle
247	03.14	NGC 6814	19 39 54	-10 26'59	133	5 50	Branduardi
247	11.47	ESO141-G55	19 16 57	-58 45'52	115	3 32	Branduardi
247	17.02	ESO103-G35	18 33 22	-65 28'17	107	19 32	Pounds
248	18.51	NGC 7314	22 33 01	-26 18'00	160	3 58	Pounds

Day	Time	Target	RA	Dec	SAA	Duration h m	Principal Investigator
249	01.58	Fairall 9	01 21 51	-59 03'59	121	2 51	Scarsi
249	07.35	3A0234-526	02 36 41	-52 24'30	116	3 14	Pye
249	13.16	NGC 526A	01 22 00	-35 18'00	136	6 20	Turner
249	22.40	1978 Nov 19	01 16 32	-28 53'00	140	22 53	Hurley
251	00.20	1803+78	18 03 39	+78 27'54	87	7 18	Biermann
251	09.16	AKN 120	05 13 38	-00 12'16	87	2 44	Pounds
251	13.20	NGC 2110	05 49 47	-07 28'06	78	3 48	Pounds
251	19.43	VW Cep	20 38 03	+75 24'52	96	11 18	Heise
252	15.3	IC 443	06 13 45	+22 40'00	73	5 40	Bleeker
252	22.19	IE0630+1748	06 30 00	+17 47'59		9 49	Caraveo
253	10.23	NGC 2264	06 38 17	+09 42'19	67	14 17	Charles
254	02.51	LP658-2	05 52 42	-04 09'00	80	5 54	Heise
254	11.30	4U1715-39	17 15 07	-39 19'12	93	1 21	Van Paradijs
254	14.13	HR 5999	16 05 12	-38 58'22	79	7 8	Brown
254	22.46	4U1705-32	17 05 40	-32 13'12	90	1 30	Van Paradijs
255	03.17	3C 382	18 33 12	+32 39'15	103	22 53	Perryman
256	07.44	SU Uma	08 08 04	+62 45'36	68	3 15	Evans
256	18.12	BD 75-325	08 04 44	+75 06'48	76	2 17	De Korte
256	22.50	Cyg X-2	21 42 37	+38 05'28	132	2 27	Treves
257	04.18	WW Cet	00 08 52	-11 45'27	166	4 22	Beuermann
257	11.15	RCW 86	14 36 48	-62 23'33	76	3 54	Peacock
257	17.04	GX5-1	17 58 03	-25 04'39	99	1 54	Kendziorra
257	21.40	H2252-035	22 52 43	-03 26'40	171	7 19	Pietsch
258	07.48	3U1809+50	18 15 08	+50 00'55	95	1 30	Heise
258	10.05	3U1809+50	18 15 08	+49 30'55	95	6 19	Heise
258	19.20	Cyg X-2	21 42 37	+38 05'28	132	2 3	Treves
258	23.46	GR 372	17 48 53	+70 52'42	89	20 10	Heise
260	04.25	H2252-035	22 52 43	-03 26'40	169	6 17	Pietsch
260	12.58	XB1916-05	19 16 00	-05 19'51	115	7 57	White
260	22.38	V 566 Oph	17 54 23	+04 59'31	94	3 18	Heise
261	04.03	MKN 504	16 59 12	+29 29'00	80	2 43	Bleeker
261	09.13	4U1909+07	19 09 12	+07 37'30	112	1 10	Van Paradijs
261	12.41	4U1812-12	18 12 26	-12 07'48	98	1 25	Van Paradijs
261	16.26	Cyg X-2	21 42 37	+38 05'28	131	1 55	Treves
261	20.46	HD 209943	22 00 13	+82 37'51	95	2 4	Heise
262	09.00	Tau-C1 F1	04 26 14	+26 03'30	106	5 18	Bleeker
262	16.37	3A0656-072	06 56 00	-07 12'00	72	2 33	Warwick
262	23.15	NGC 1535	04 11 48	-12 51'33	105	15 7	Osborne
263	23.35	Cyg X-2	21 42 37	+38 05'28	131	1 10	Treves
264	03.29	NGC 1832	05 09 47	-15 44'48	100	2 5	Fricke
264	07.44	HD 497985	06 47 29	-43 59'55	81	1 51	De Korte
264	12.04	AM Her	18 14 57	+49 50'54	93	1 46	Heise
264	14.22	AM Her	18 15 35	+49 50'19	93	7 10	Heise
265	00.03	OA01653-40	16 57 16	-41 34'45	80	8 18	Parmar

Day	Time	Target	RA	Dec	SAA	Duration h m	Principal Investigator
265	09.48	G357.7-0.1	17 36 59	-30 57'00	87	3 19	Aschenbach
265	16.12	Cyg X-2	21 42 37	+38 05'28	130	2 17	Treves
265	20.40	GX13+1	18 11 37	-17 10'16	94	3 1	Taylor
266	93,12	1803+78	18 03 39	+78 27'54	90	7 59	Biermann
266	13.02	4U1744-26	17 44 49	-26 32'49	87	19 43	D'Amico
267	13.03	GX1+4	17 28 58	-24 42'44	83	12 52	Hall
268	04.15	Cyg X-1	19 56 28	+35 03'55	117	5 40	Page
268	12.20	Tycho SNR	22 29 59	+63 51'38	114	3 0	Davelaar
268	17.47	Tycho SNR	00 22 30	+63 51'38	114	10 8	Davelaar
269	06.01	3C58	02 01 51	+64 35'23	122	4 10	Davelaar
269	12.55	TAU-C2F1	04 52 39	+30 31'12	106	8 38	Bleeker
270	00.15	4U1728-16	17 28 49	-16 55'32	81	27 25	Charles
271	11.20	D143631	16 12 48	+33 59'03	66	27 32	Brinkman
272	20.21	4U2129+47	21 29 35	+47 04'08	122	3 13	Pietsch
273	02.11	NGC 3031	09 48 29	+69 00'00	75	4 24	Bleeker
273	08.50	PSR 0833-45	08 33 39	-45 00'19	66	9 36	Zimmermann
273	18.49	PSR 0833-45	08 33 28	-45 01'04	66	5 21	Zimmermann
274	03.13	G21.5-0.9	18 30 47	-10 36'55	91	18 22	Davelaar
275	04.18	Beta Ori	05 12 08	-08 15'29	109	5 43	UV 1*
275	12.23	Crab Nebula	05 31 31	+21 58'54	105	12 37	Brinkman
276	02.13	1st Pnt ME Raster	05 24 26	+23 38'20	107	0 47	Brinkman
277	14.15	End Pnt ME Raster	05 31 46	+20 25'29		0 47	Brinkman
277	15.46	Crab Nebula	05 31 31	+21 58'54	107	2 11	Brinkmaan
277	19.58	4U2129+47	21 29 35	+47 04'08	121	24 7	Pietsch
278	21.15	4U2129+47	21 29 35	+47 04'08	121	2 30	Pietsch
279	02.06	EY Cygni	19 52 40	+32 13'39	107	7 39	Beuermann
279	13.10	MR 2251	22 51 25	-17 50'54	144	24 5	PV/CAL Phase
280	15.17	1822-371	18 22 22	-37 08'03	81	5 32	Mason
280	23.20	CN Ori	05 49 39	-05 25'34	93	3 51	Mason
281	14.40	1803+78	18 03 38	+78 27'54	64	6 25	Biermann
281	23.26	0851+202	08 51 57	+20 17'57	65	11 40	Willmore
282	16.34	Fairall 9	01 21 47	-58 59'00	114	3 21	Scarsi
282	21.21	WX Hyi	02 08 17	-63 28'13	109	4 0	Mason
283	03.53	1928+73	19 27 37	+73 51'14	98	8 6	Biermann
283	14.35	MK509	20 41 12	-10 50'34	113	4 21	Molteni

*UV star observation: calibration of filter UV sensitivity

EXOSAT OBSERVATORY STRUCTURE/POINTS OF CONTACT

The EXOSAT ground observatory is located at ESOC. It is staffed by the observatory team comprised of Duty Scientists (sometimes referred to as Resident Astronomers), System Analysts and Programmers, Data Aides and Secretarial support.

Dr David Andrews (extension 705), the Observatory Manager at ESOC is responsible for the day-to-day management, organisation and running of the observatory and the generation of the observatory output in terms of FOTs and auto-analysis.

Within the observatory team at ESOC Mr Mike McKay (extension 707) is the mission planning co-ordinator, responsible for generating the time-line and liaison with observers in that regard.

When the time-line is established, the observations in each orbit are assigned to a duty scientist whose responsibility it is to liaise with the principal investigator concerning the establishment of instrument and OBC operational modes, possible changes in these modes which might be required through the observation, graphics displays, etc.

Dr Tony Peacock (extension 3563*), as Project Scientist, located at ESTEC, is responsible for the scientific output of the mission, the overall observatory programme and is secretary to the COPS. He authorises and approves the observation time-line and any changes thereto.

Dr Brian Taylor (extension 3556), Head of the High Energy Astrophysics Division, SSD at ESTEC, has overall responsibility for the EXOSAT mission including staffing, budget, policy and general conduct.

The selection of observation proposals in response to the Announcement of Opportunity is made by the COPS (Committee for Observation Proposal Selection) comprising twelve eminent scientists active in astronomy.

Reports on mission status are routinely given to the Astronomy Working Group (AWG) and the Space Science Advisory Committee (SSAC) and the Science Programme Committee (SPC).

Telephone and telex numbers are as follows:

ESOC Telephone 6151-8861, telex 419453
ESTEC " 1719-86555, " 39098

* Note the 4 digit extensions can be dialled directly,
eg. 1719-83563

OBSERVATORY TEAM PERSONNEL/RESPONSIBILITIES

		Ext.
David Andrews	Observatory Manager	705*
Julian Sternberg	Observatory Software	703
Julian Lewis	System Software/HP Computers	702
Christine Durham	On-board Software	712
Paul Barr	Duty Scientist	715
Rod Blissett	"	713
Lucio Chiappetti	"	717
Thierry Courvoisier	"	711
Jaap Davelaar	"	710
Paolo Giommi	"	715
Manfred Gottwald	"	707
Mike McKay	"	707
Julian Osborne	"	714
Arvind Parmar	"	716
Glenn Pollard	"	758
Luigi Stella	"	716
Ann Fahey	Data Assistant	709
Sandra Andrews	Secretary	704

*Direct dialling to any extension, prefixed by 886, is possible, eg. 06151-886-705

Notice of 18th ESLAB Symposium

Space Science Department (originally ESLAB) will hold their eighteenth annual symposium in late October or early November 1984 in Scheveningen, The Hague, Netherlands. The subject will be:

X-RAY ASTRONOMY

A first announcement, when details are finalised, will be issued shortly.

TRAVEL

- ESOC is located at:

  ROBERT BOSCH STRAßE 5,
  61 DARMSTADT,
  WEST GERMANY.

  (See map on page 19)

- FRANKFURT-AM-MAIN AIRPORT is located approximately 30 km north of Darmstadt.

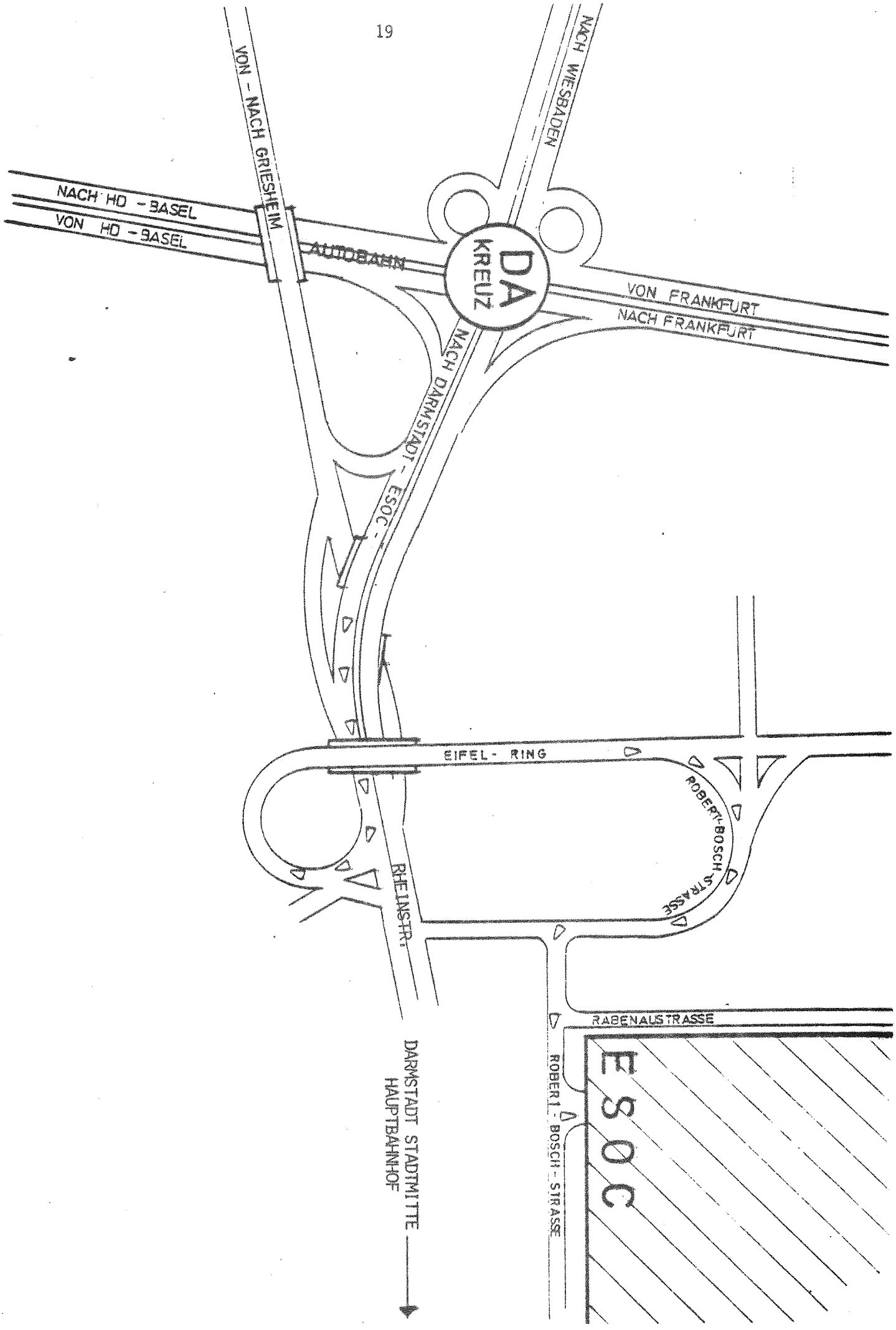
- DARMSTADT HAUPTBAHNHOF is approximately 10 mins brisk walk from ESOC, along the Rheinstrasse and Berliner Allee.

- AUTOBAHN routes 5 (Frankfurt-Basel) and 67

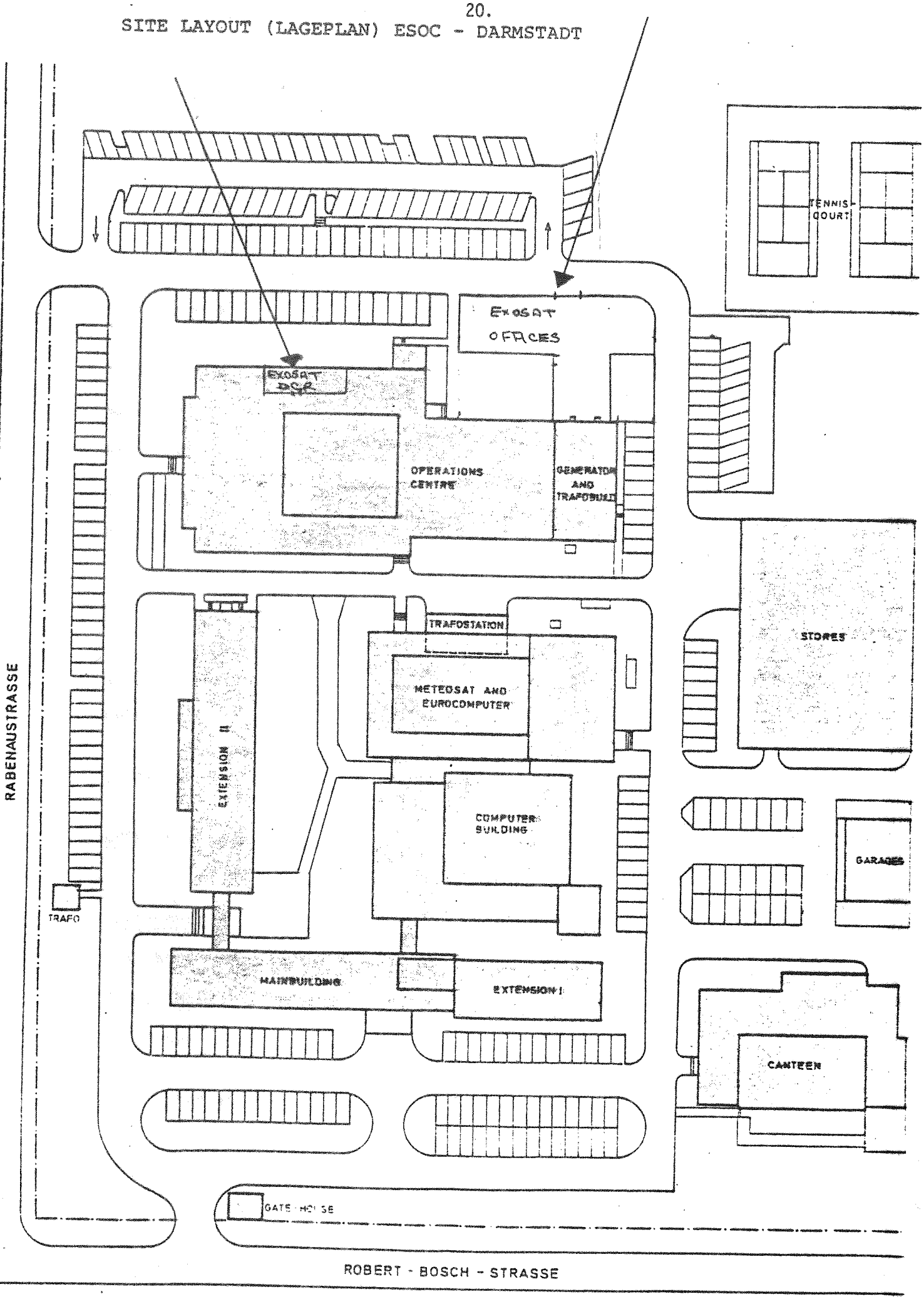
  Intersection at the DARMSTÄDTER KREUZ (about 1 km west of ESOC).

  Take exit DARMSTADT STADTMITTE

- Within ESOC, the Observatory is located in the Operations Department (OD) Building. (See map on page 20).


VON - NACH GRIESHEIM
NACH WIESBADEN
NACH HD - BASEL
VON HD - BASEL
AUTOBAHN
DA KREUZ
VON FRANKFURT
NACH FRANKFURT
NACH DARMSTADT - ESOC
EIFEL - RING
ROBERT-BOSCH-STRASSE
RHEINSTR.
RABENAUSTRASSE
ROBERT-BOSCH-STRASSE
ESOC
DARMSTADT STADTMITTE
HAUPTBAHNHOF

SITE LAYOUT (LAGEPLAN) ESOC - DARMSTADT



HOTELS

Name of Hotel	Address	Phone No.	Price - DM single room
Darmstadt		(06151)	
Maritim Hotel	Rhein Str. 105 (Near Hbf)	80041	110-186*
Parkhaus Hotel	Grafen Str. 31	28100	87
Hotel Weinmichel	Schleiermacher Str.10	26822	65-95
Prinz Heinrich	Bleich Str. 48	82888	69-78
City Hotel	Adelung Str. 44	33691/95	55-80
Hotel Müller	Adelung Str. 34	26721/22	50-65
Zentral Hotel	Schuchard Str. 6	26411/12	55-65
Ernst-Ludwig	Ernst-Ludwig Str.14	26011/12	40-68
Darmstadt-Eberstadt		(06151)	
Hotel Zur Sonne	Heidelberger Land Str. 246	55754	59
Darmstädter Hof	Heidelberger Land Str. 249	54222	45-50
Griesheim		(06155)	
Hotel Postkutsche	Flughafen Str. 18	61772	40
Ober-Ramstadt		(06154)	
Hessischer Hof	Shul Str. 14	2151 3067	48-52
Nieder Modau		(06154)	
Zur Krone	Kirch Str. 39	1633	64-74

*If booked via ESOC a special rate can be obtained.

Name of Hotel	Address	Phone No.	Price - DM single room
Seeheim-Jugenhem		(06151)	
Hotel Malchen	Im Grund 21	55031	65-70
Jugenheim		(06257)	
Brandhof	Stettbacher Tal 61	2689	44-50
Hotel Jugenheim	Haupt Str. 54	2005/6	68
Seeheim			
Hotel Tanneck	Sand Str. 79	81364	26-28

QUESTIONNAIRE

☐ There is an error in my name or address on the current mailing list; the correct version is given below.

☐ Please add my name and address (printed below) to the EXOSAT Express mailing list.

☐ Please delete my name and address (printed below) from the EXOSAT Express mailing list.

NAME: _____

ADDRESS: _____

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Tear off the page and return to: EXOSAT Observatory, ESOC, Darmstadt.