DRm

NORSAR

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SEMIANNUAL TECHNICAL REPORT
NORSAR PHASE 3

1 January – 30 June 1974

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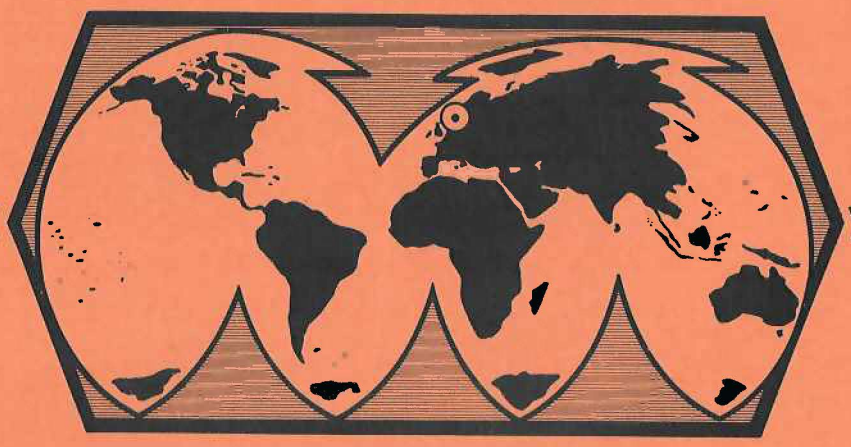
Kjeller, 1 September 1974



O. DETECTION PROCESSOR OPERATION

Apart from an 81 hour break in the recording, due to breakdown of the Special Processing System (see below), the Detection Processor has been run with the purpose of having minimal system down time in this period. The Detection Processor has thus been up 97% of the time, as compared to 98.3% in the last reporting period. No significant changes have been made to the DP software in this period.

Data Recording and DP Down Time

Figure O.1 and the accompanying table O.1 show the daily total DP down time in hours, for the days between 1 January and 30 June, inclusive.

The monthly recording times and percentages up are given in Table O.2, while Tables O.3 and O.4 compile statistical data on the overall use of the A and B computers, respectively. As is clearly visible from Figure O.1, the overshadowing event in this period was the breakdown of the Special Processing System (SPS), which was due to a malfunctioning hardware component. Around 81 hours elapsed before the error was located and repaired, causing a corresponding time gap in the recorded data.

Additionally, around 50 hours of down time is spread evenly in the period, with a little increase in June. This last effect is explained by the frequent summer thunder storms, causing power breaks and jumps. Table O.1 lists the day number, start and stop time for each break, together with a short comment. The 100 breaks in the period can be grouped:

Tape drive problems	15
Power breaks/jumps and related stops	13

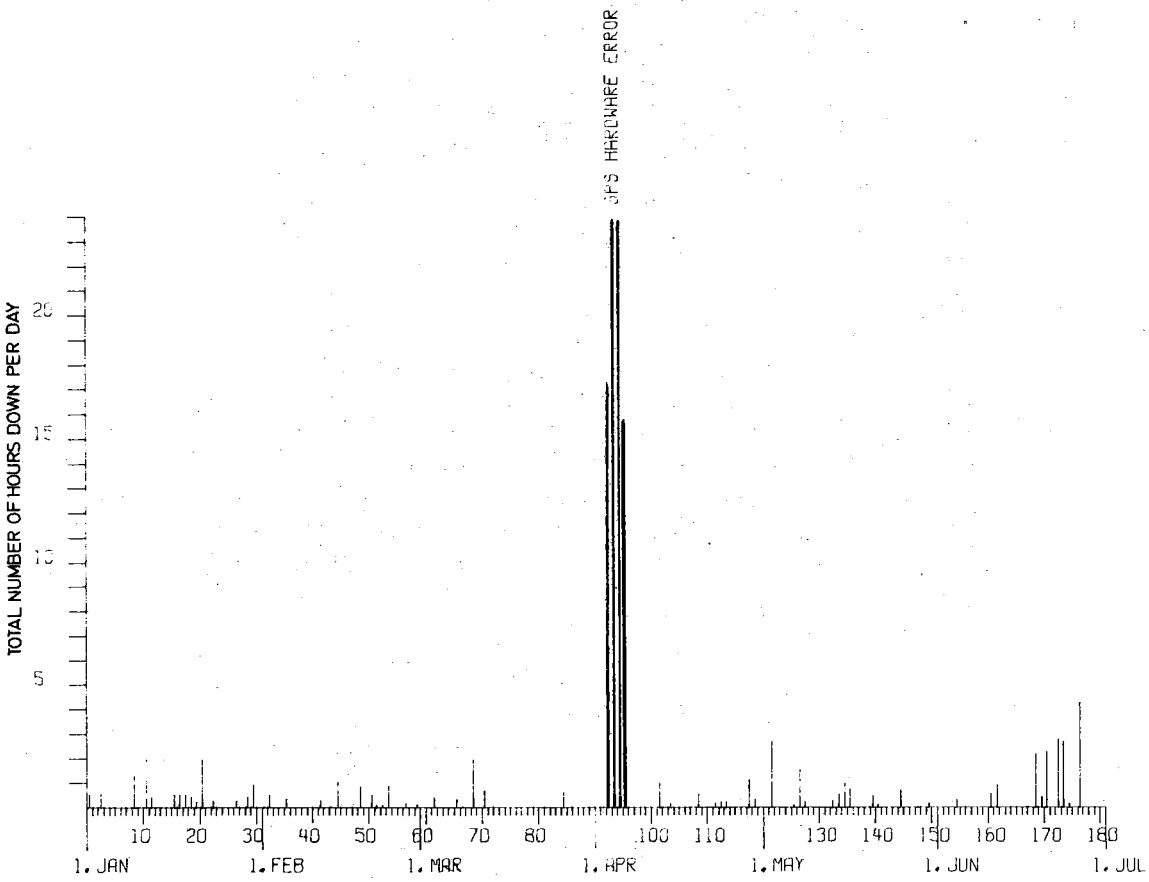


Fig. O.1 Daily Detection Processor down time Jan-June 1974.

LIST OF BREAKS IN DP PROCESSING THE LAST HALF-YEAR

DAY	START		STOP		COMMENTS.....
1	2	20	2	30	WRONG TIME ON DP MSG
1	7	20	7	25	WRONG TIME ON DP MSG
1	17	49	18	7	TOD ADJUSTMENT
3	8	27	9	3	TEST 160 TAPE DRIVES
9	10	50	12	7	POWER BREAK
11	8	6	8	52	CE WORK
11	11	12	12	1	CPU ROS/DATA & CTRL ON
11	15	45	16	8	CPU ROS/DATA & CTRL ON
12	13	47	13	58	BAD PRINTER A TO B
12	16	27	16	42	POWER BREAK
16	7	15	7	22	B TO A
16	9	51	10	17	UNKNOWN
17	3	36	4	10	CPU ERROR
18	3	22	3	34	TAPE SPOOLING
18	19	8	19	29	CPU ROS/DATA & CTRL ON
19	1	1	1	29	UNKNOWN
20	12	26	12	40	SHARED DISK DOWN
21	7	41	9	34	SHARED DISK DOWN
21	12	32	12	37	RESTORE ECC LIGHTS
23	13	10	13	16	PROGRAM CHANGE
23	13	35	13	47	SWITCH CARD READERS
27	12	54	13	12	TAPE DRIVE TROUBLE(161)
29	14	40	15	8	SPS INTER NOT RECEIVED
30	19	55	20	51	CPU ROS DATA/CTRL ATOB
32	14	0	14	4	B TO A
33	12	32	13	3	TAPES SPOOLING A TO B
36	9	39	9	44	B TO A
36	15	11	15	29	TAPES SPOOLING
42	11	55	12	13	CPU ROS DATA/CTRL ON
44	11	51	11	55	PROG CHANGES
45	16	7	16	26	CPU ROS DATA/CTRL ON
45	21	2	21	46	CPU ROS DATA/CTRL ON
49	1	0	1	13	CPU ROS DATA/CTRL ON
49	10	9	10	31	POWER JUMP
49	17	20	17	25	SELECT LIGHT ON 161
49	17	30	17	36	TAPES NOT ACCEPTED
49	17	39	17	45	TAPES NOT ACCEPTED
51	12	30	12	36	CHANGE ROS-TAPE A TO B
51	14	30	14	35	B TO A
51	17	50	18	11	CPU ROS DATA/CTRL ON
52	13	0	13	7	WRONG TIME ON DP MSGS
53	23	54	24	0	I/O ERROR,CHN CNTRL CHK
54	0	0	0	19	I/O ERROR,CHN CNTRL CHK
54	15	56	16	31	UNKNOWN
57	2	0	2	10	CHNL 2 BLOCKED BY EP
59	18	13	18	19	PROG CHANGE TEST
59	10	34	10	37	PROG CHANGE
62	14	31	14	56	EX & EARLY LIGHT ON
66	21	54	22	14	TAPE ERRORS ON 253
67	10	55	10	59	PROG CHANGE(160S UP)
69	10	54	12	21	SHARED DISK NOT READY
69	19	51	20	23	1052 BAD A TO B
71	12	31	13	12	B TO A
85	10	7	10	44	POWER JUMP
92	14	28	14	32	CHANGE TAPE DRIVES
93	6	39	24	0	SPS HARDWARE ERROR

TABLE O.1

(Sheet 1 of 2)

LIST OF BREAKS IN DP PROCESSING THE LAST HALF-YEAR

DAY	START		STOP		COMMENTS.....
94	0	0	24	0	SPS HARDWARE ERROR
95	0	0	24	0	SPS HARDWARE ERROR
96	0	0	15	52	SPS HARDWARE ERROR
102	20	53	21	29	CPU STOP MPX & LATE ON
102	23	6	23	30	CPU STOP MPX & LATE ON
104	6	0	6	11	MPX & LATE ON A TO B
109	10	14	10	24	B TO A
109	22	45	23	10	SELECT LIGHT ON 164
112	10	56	11	7	MPX & LATE LIGHTS ON
113	19	50	20	4	MPX & LATE LIGHTS ON
114	17	35	17	49	SELECT LIGHT ON 162
118	3	6	4	3	POWER JUMP A TO B
118	9	34	9	45	UNKNOWN
119	10	41	11	1	UNKNOWN
122	3	10	4	29	POWER BREAK
122	4	34	5	13	POWER JUMP
122	9	23	10	8	SPS FRAME 1 CB OFF
126	14	26	14	32	PROG CHANGE TEST BTOA
127	6	59	8	32	DISK TROUBLE
128	22	11	22	26	POWER OFF/ON
133	7	6	7	10	SET UP NEW VERSION
133	7	16	7	30	PROG CHECK
134	3	47	4	6	PROG CHK OLD VERS. UP
134	10	3	10	6	PROG CHANGE
134	12	35	12	49	PROG CHECK
135	19	19	20	19	MPX & LATE LIGHTS ON
136	18	4	18	50	MPX & LATE LIGHTS ON
140	17	23	17	53	WRONG TIME ON DP MSGS
141	13	45	13	54	MPX & LATE LIGHTS ON
145	12	53	13	19	TAPE SPOOLING (274)
145	14	46	15	3	TAPE SPOOLING (274)
148	9	0	9	5	PROG CHANGE
150	4	4	4	14	PROG CHANGE TEST
155	21	47	22	8	MPX CHANNEL TIED UP
161	1	33	2	8	PLOT TAPE NOT COMPAT.
162	15	35	16	31	UNKNOWN
169	3	59	4	54	SPS RED LIGHT FRAME 1
169	5	7	5	23	SPS RED LIGHT FRAME 1
169	5	28	6	30	SPS RED LIGHT FRAME 1
170	0	14	0	42	SPS RED LIGHT FRAME 1
171	11	3	11	33	POWER FAILURE
171	11	33	13	20	NO SPS INTER RECEIVED
173	1	23	1	35	SPS AIR CONDITION
173	14	14	16	52	POWER FAILURE
174	3	45	6	27	UNKNOWN
175	0	38	0	48	AIR CONDITION STOP
177	15	35	19	18	THUNDER A DOWN
177	19	50	20	25	POWER UP ON A

TABLE O.1

(Sheet 2 of 2)

TABLE O.2

DP and EP Computer Usage, 1 January - 30 June 1974

Month	DP Uptime (Hrs)	DP Uptime (%)	EP Uptime (Hrs)	EP Uptime (%)	No. of DP Error Stops	DP MTBF (Days)
Jan	735	98.8	248.5	33.4	24	1.3
Feb	666.5	99.2	206	30.7	22	1.3
Mar	740.5	99.5	207	27.8	7	4.4
Apr	635.5	88.2	163	22.6	13	2.0
May	734.5	98.8	242	32.5	19	1.6
Jun	703.5	97.7	216	30.0	15	2.0
Total	4216	97.0	1283	29.5	100	1.7

TABLE O.3

A-Computer Usage (Hrs), 1 Jan - 30 June 1974.

Month	DP	EP	Job Shop	Data Ret. Copy	Array Moni-toring	DP Test	C.E. Maint.	Power Break	Machine Failure	SPS Failure	Plot in Fl	Hands On
Jan	619	55	46	19	7	1.3	4	2	3.5		34	
Feb	582	32	19		6	0.5	4.3	0.5	4		21	
Mar	700	7	14		1.5		9.5	0.5	9		17	
Apr	444	45	50		6			1	2	81	75	6
May	603	36	27		11	1.5	0.2	3	4.5		35	2
Jun	703.5							10	3		23	
Total	3652	175	156	19	31	3	18	17	26	81	205	8

TABLE O.4

B-Computer Usage (Hrs), 1 Jan - 30 June 1974.

Month	DP	EP	Job Shop	Data Ret. Copy	Array Moni-toring	DP Test	C.E. Maint.	Power Break	Machine Failure	Plot in Fl	Hands On
Jan	116	193.5	297	117	16.5		2.3	2		181	
Feb	84.5	174	318	70.5	30.5		3	0.5		206	
Mar	40.5	200	338	97	37.5	2.3	18.5	0.5		211	
Apr	191.5	118	174	61	16		0.5	1	0.5	105	11
May	131.5	206	283	107.5	33		2	3		197	
Jun		216	408	44	45		1	10		180	
Total	564	1108	1818	497	179	2	27	17	0.5	1080	11

SPS problems	8
Shared disk down	3
Other hardware problems	36
CE maintenance	1
Software problems	13
TOD (Time-of-day) adjustment & related problems	5
Unknown	7

Included under the different headings are the stops caused by re-starting DP on the A computer after error recovery.

The "Shared disk down" category contains the cases when the operator stopped DP because no detections were written to the disk pack shared between DP and EP. Due to a software modification, DP now warns the operator, by ringing a bell, every time it has something that should have been written on the disk pack declared down. The "Software problems" category also contains the cases of restarts with program modifications.

The total down time for the period was 131 hours 22 minutes. The overall mean time between failures was 1.7 days, compared to 1.6 days for the last reporting period.

DP Algorithms and Parameters

No major changes have been introduced in DP algorithms or parameters this period. In addition to the modification mentioned above, coding has been changed to prevent printing of redundant output from DP, thus reducing the total output volume in order to save paper.

Also, preparatory changes have been made to eventually overlay the message task. This is done to gain core space for the implementation of a future Network Control

Program. However, to make DP work properly with the message task as an overlay, modifications must be done in the DOS Supervisor. These modifications are presently being investigated.

D. Rieber-Mohn