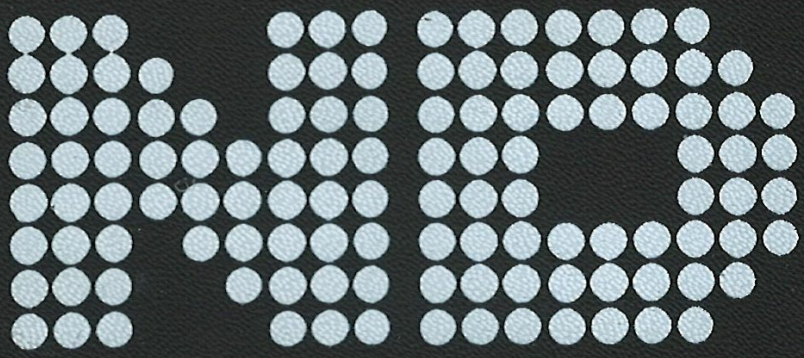

SERVICE HANDBOOK
VOL. III

Chapter 1

Device Numbers

HARDWARE DEVICE NAME		FIRST DEVNO	LAST DEVNO	IDENT -CODE	INT.LEVEL 10	11	12	13	SINTRAN-III LOG. DEVNO
10 MB DISC CONTR.	1	500	507	1		X			502
10 MB DISC CONTR.	2	510	517	5		X			1104
A/D-CONVERTER	1	1440	1443	101	X		X		
A/D-CONVERTER	2	1444	1447	102	X		X		
A/D-CONVERTER	3	1450	1453	103	X		X		
A/D-CONVERTER	4	1454	1457	104	X		X		
A/D-CONVERTER	5	1460	1463	105	X		X		
A/D-CONVERTER	6	1464	1467	106	X		X		
A/D-CONVERTER	7	1470	1473	107	X		X		
A/D-CONVERTER	8	1474	1477	110	X		X		
ACM	1	40	43	15	X				734
ACM	2	44	47	25	X				735
ACM	3	50	53	40	X				736
ACM	4	54	57	41	X				737
ACM	5	60	63	16	X				740
BIG DISC CONTR, Nord-10	1	1540	1547	17		X			1100
BIG DISC CONTR, Nord-10	2	1550	1557	20		X			1207
BIG MPM ERROR LOG		750	753	5				X	
BUS EXPANDER	1	100000	100003	10				X	
BUS EXPANDER	2	100004	100007	11				X	
BUS EXPANDER	3	100010	100013	12				X	
BUS EXPANDER	4	100014	100017	13				X	
BUS EXPANDER	5	100020	100023	14				X	
BUS EXPANDER	6	100024	100027	15				X	
BUS EXPANDER	7	100030	100033	16				X	
BUS EXPANDER	8	100034	100037	17				X	
BUSC	1	100200	100203	20				X	
BUSC	2	100204	100207	21				X	
BUSC	3	100210	100213	22				X	
BUSC	4	100214	100217	23				X	
BUSC	5	100220	100223	24				X	
BUSC	6	100224	100227	25				X	
BUSC	7	100230	100233	26				X	
BUSC	8	100234	100237	27				X	
BUSC	9	100240	100243	30				X	
BUSC	10	100244	100247	31				X	
BUSC	11	100250	100253	32				X	
BUSC	12	100254	100257	33				X	
BUSC	13	100260	100263	34				X	
BUSC	14	100264	100267	35				X	
BUSC	15	100270	100273	36				X	
BUSC	16	100274	100277	37				X	
CALCOMP PLOTTER	1	440	443	11	X				10
CALCOMP PLOTTER	2	450	453	21	X				35
CARD PUNCH	1	444	447	12	X				50
CARD PUNCH	2	454	457	13	X				51
CARD PUNCH	3	450	453	21	X				35
CARD READER	1	420	423	3			X		4
CARD READER	2	424	427	23			X		14
CATSY	1	700	707	11			X		20
CATSY	2	710	717	21			X		21
CDC I/O-LINK		620	637	10		X			36
CORE-TO-CORE	1	610	617	11		X			23
CTI	1	141660	141667	140166	X		X		

HARDWARE DEVICE NAME		FIRST DEVNO	LAST DEVNO	IDENT -CODE	INT.LEVEL 10	11	12	13	SINTRAN-III LOG. DEVNO
CTI	2	141670	141677	140167	X		X		
CTI	3	141700	141707	140170	X		X		
CTI	4	141710	141717	140171	X		X		
CTI	5	141720	141727	140172	X		X		
CTI	6	141730	141737	140173	X		X		
CTI	7	141740	141747	140174	X		X		
CTI	8	141750	141757	140175	X		X		
D/A-CONVERTER		730	737	10	X				
DIGITAL FIELD SYSTEM	1	140260	140277	140030			X		
DIGITAL FIELD SYSTEM	2	140300	140317	140031			X		
DIGITAL FIELD SYSTEM	3	140320	140337	140032			X		
DIGITAL FIELD SYSTEM	4	140340	140357	140033			X		
DIGITAL REG. INPUT	1	770	773	17			X		400
DIGITAL REG. INPUT	2	1000	1003	26			X		401
DIGITAL REG. INPUT	3	1010	1013	27			X		402
DIGITAL REG. INPUT	4	1020	1023	43			X		403
DIGITAL REG. OUTPUT	1	774	777	17	X				400
DIGITAL REG. OUTPUT	2	1004	1007	26	X				401
DIGITAL REG. OUTPUT	3	1014	1017	27	X				402
DIGITAL REG. OUTPUT	4	1024	1027	43	X				403
E & S PICT. SYST. DMA		720	727	23		X			
E & S PICT. SYST. PIO		460	467	31	X		X		
ECC DISC CONTR, Nord-10	1	1540	1547	17		X			1100
ECC DISC CONTR, Nord-10	2	1550	1557	20		X			1207
ECCR		100115	100115						
ETHERNET CONTR.	1	140360	140363	140034			X		
ETHERNET CONTR.	2	140364	140367	140035			X		
ETHERNET CONTR.	3	140370	140374	140036			X		
ETHERNET CONTR.	4	140374	140377	140037			X		
EXTERNAL INTERRUPT	1	24	27	7				X	
EXTERNAL INTERRUPT	2	20	23	6				X	412
FINCH 8" DISC CONTR.	1	500	507	1		X			1224
FINCH 8" DISC CONTR.	2	510	517	5		X			1231
FLOPPY & STREAMER 5 & 8	1	1560	1567	21		X			1145
FLOPPY & STREAMER 5 & 8	2	1570	1577	22		X			1156
FLOPPY & STREAMER 8"	1	1560	1567	21		X			1145
FLOPPY & STREAMER 8"	2	1570	1577	22		X			1156
FLOPPY DISC DMA	1	1560	1567	21		X			1145
FLOPPY DISC DMA	2	1570	1577	22		X			1156
FLOPPY DISC PIO	1	1560	1567	21		X			1145
FLOPPY DISC PIO	2	1570	1577	22		X			1156
GPIB	1	140000	140007	140000		X			2120
GPIB	2	140010	140017	140001		X			2121
GPIB	3	141400	141407	140140		X			2122
GPIB	4	141410	141417	140141		X			2123
GPIB	5	141420	141427	140142		X			2124
GPIB	6	141430	141437	140143		X			2125
GPIB	7	141440	141447	140144		X			2126
GPIB	8	141450	141457	140145		X			2127
GRAPHICAL PEN		470	477				X		
HASP DMA	1	560	577	156			X	X	1006
HASP DMA	2	620	637	157			X	X	1007
HASP DMA	3	700	717	160			X	X	1010
HASP DMA	4	720	737	161			X	X	1011

HARDWARE DEVICE NAME		FIRST DEVNO	LAST DEVNO	IDENT -CODE	INT.LEVEL 10	11	12	13	SINTRAN-III LOG. DEVNO
HASP DMA	5	1500	1517	162			X	X	1012
HASP DMA	6	1520	1537	163			X	X	1013
HDLC / MEGALINK	1	1640	1657	150			X	X	1360
HDLC / MEGALINK	2	1660	1677	151			X	X	1362
HDLC / MEGALINK	3	1700	1717	152			X	X	1364
HDLC / MEGALINK	4	1720	1737	153			X	X	1366
HDLC / MEGALINK	5	1740	1757	154			X	X	1370
HDLC / MEGALINK	6	1760	1777	155			X	X	1372
HDLC / MEGALINK	7	2000	2017	200			X	X	
HDLC / MEGALINK	8	2020	2037	201			X	X	
HDLC / MEGALINK	9	2040	2057	202			X	X	
HDLC / MEGALINK	10	2060	2077	203			X	X	
HDLC AUTO LOAD		1600	1603						
HDLC PIO	1	1640	1657	150			X	X	
HDLC PIO	2	1660	1677	151			X	X	
HDLC PIO	3	1700	1717	152			X	X	
HDLC PIO	4	1720	1737	153			X	X	
HDLC PIO	5	1740	1757	154			X	X	
HDLC PIO	6	1760	1777	155			X	X	
HDLC PIO	7	2000	2017	200			X	X	
HDLC PIO	8	2020	2037	201			X	X	
HDLC PIO	9	2040	2057	202			X	X	
HDLC PIO	10	2060	2077	203			X	X	
HDLC REMOTE LOAD	1	1604	1607						
HDLC REMOTE LOAD	2	1610	1613						
HDLC REMOTE LOAD	3	1614	1617						
HDLC REMOTE LOAD	4	1620	1623						
HDLC REMOTE LOAD	5	1624	1627						
HDLC REMOTE LOAD	6	1630	1633						
HDLC REMOTE LOAD	7	1634	1637						
HP MAG TAPE CONTR.	1	520	527	3		X			560
HP MAG TAPE CONTR.	2	530	537	7		X			1111
LINE PRINTER	1	430	433	3	X				5
LINE PRINTER	2	434	437	23	X				15
LINE PRINTER	3	160	163	35	X				1014
LINE PRINTER	4	164	167	36	X				1015
LINE PRINTER	5	170	173	33	X				
LINE PRINTER	6	174	177	32	X				
MEMORY PARITY N12/N42		4	7	4				X	
ND-500	1	60	77	16			X		
ND-500	2	1060	1077	116			X		
ND-500	3	660	677	36			X		
ND-500	4	760	777	114			X		
ND-500	5	560	577	76			X		
NORD-10 BUS ADAPTER	1	100040	100041						
NORD-10 BUS ADAPTER	2	100042	100043						
NORD-10 BUS ADAPTER	3	100044	100045						
NORD-10 BUS ADAPTER	4	100046	100047						
NORD-10 BUS ADAPTER	5	100050	100051						
NORD-10 BUS ADAPTER	6	100052	100053						
NORD-10 BUS ADAPTER	7	100054	100055						
NORD-10 BUS ADAPTER	8	100056	100057						
NORD-10 BUS ADAPTER	9	100060	100061						
NORD-10 BUS ADAPTER	10	100062	100063						

HARDWARE DEVICE NAME		FIRST DEVNO	LAST DEVNO	IDENT -CODE	INT.LEVEL 10	11	12	13	SINTRAN-III LOG. DEVNO
NORD-10 BUS ADAPTER	11	100064	100065						
NORD-10 BUS ADAPTER	12	100066	100067						
NORD-10 BUS ADAPTER	13	100070	100071						
NORD-10 BUS ADAPTER	14	100072	100073						
NORD-10 BUS ADAPTER	15	100074	100075						
NORD-10 BUS ADAPTER	16	100076	100077						
NORD-50	1	30	33	16			X		1103
NORD-50	2	1030	1033	116			X		1347
NORD-50	3	630	633	36			X		1350
NORD-50	4	730	733	176			X		1351
NORD-50	5	530	533	76			X		1353
NORD-50 REGISTERS	1	60	77						
NORD-50 REGISTERS	2	1060	1077						
NORD-50 REGISTERS	3	660	677						
NORD-50 REGISTERS	4	760	777						
NORD-50 REGISTERS	5	560	577						
OCTOBUS INTERFACE	1	100400	100407	60,61				X	2400
OCTOBUS INTERFACE	2	100410	100417	62,63				X	2420
OCTOBUS INTERFACE	3	100420	100427	64,65				X	2440
OCTOBUS INTERFACE	4	100430	100437	66,67				X	2460
PAPER TAPE PUNCH	1	410	413	2	X				3
PAPER TAPE PUNCH	2	414	417	22	X				13
PAPER TAPE READER	1	400	403	2			X		2
PAPER TAPE READER	2	404	407	22			X		12
PARALELL BYTE OUTPUT		430	433	3	X				
PERTEC MAG TAPE CONTR.	1	520	527	3		X			560
PERTEC MAG TAPE CONTR.	2	530	537	7		X			1111
PIOC	1	140020	140023	140002			X		1700
PIOC	2	140024	140027	140003			X		1701
PIOC	3	140030	140033	140004			X		1702
PIOC	4	140034	140037	140005			X		1703
PIOC	5	140040	140043	140006			X		1704
PIOC	6	140044	140047	140007			X		1705
PIOC	7	142120	142123	140216			X		1706
PIOC	8	142124	142127	140217			X		1707
PIOC	9	142130	142133	140220			X		1710
PIOC	10	142134	142137	140221			X		1711
PIOC	11	142140	142143	140222			X		1712
PIOC	12	142144	142147	140223			X		1713
PIOC	13	142150	142153	140224			X		1714
PIOC	14	142154	142157	140225			X		1715
PIOC	15	142160	142163	140226			X		1716
PIOC	16	142164	142167	140227			X		1717
PLOTTER / PRINTER DMA	1	142170	142177	140230		X			
PLOTTER / PRINTER DMA	2	142200	142207	140231		X			
PLOTTER / PRINTER DMA	3	142210	142217	140232		X			
PLOTTER / PRINTER DMA	4	142220	142227	140233		X			
PROCESS INPUT	1	1040	1043	15			X		
PROCESS INPUT	2	1044	1047	25			X		
PROCESS INPUT	3	1050	1053	40			X		
PROCESS INPUT	4	1054	1057	12			X		
PROCESS INPUT	5	754	757	13			X		
PROCESS OUTPUT	1	1035	1035						
PROCESS OUTPUT	2	1036	1036						

HARDWARE DEVICE NAME		FIRST DEVNO	LAST DEVNO	IDENT -CODE	INT.LEVEL 10	11	12	13	SINTRAN-III LOG. DEVNO
PROCESS OUTPUT	3	1037	1037						
RACK CONTR.		1	3					X	
RAMTEK	1	141760	141767	140176		X			
RAMTEK	2	141770	141777	140177		X			
RAMTEK	3	142000	142007	140200		X			
RAMTEK	4	142010	142017	140201		X			
RAMTEK	5	142020	142027	140202		X			
RAMTEK	6	142030	142037	140203		X			
RAMTEK	7	142040	142047	140204		X			
RAMTEK	8	142050	142057	140205		X			
REAL TIME CLOCK	1	10	13	1				X	
REAL TIME CLOCK	2	14	17	2				X	407
REAL TIME CLOCK	3	20	23	6				X	410
REAL TIME CLOCK	4	54	57	3				X	737
SMD 10 MHZ DISC CONTR.	1	1540	1547	17		X			1100
SMD 10 MHZ DISC CONTR.	2	1550	1557	20		X			1207
SMD 10 MHZ DISC CONTR.	3	540	547	2		X			565
SMD 10 MHZ DISC CONTR.	4	550	557	6		X			566
SMD 15 MHZ DISC CONTR.	1	1540	1547	17		X			1100
SMD 15 MHZ DISC CONTR.	2	1550	1557	20		X			1207
SMD 15 MHZ DISC CONTR.	3	540	547	2		X			565
SMD 15 MHZ DISC CONTR.	4	550	557	6		X			566
ST506 5" DISC CONTR.	1	500	507	1		X			1224
ST506 5" DISC CONTR.	2	510	517	5		X			1231
STC MAG TAPE CONTR.	1	520	527	3		X			560
STC MAG TAPE CONTR.	2	530	537	7		X			1111
STC MAG TAPE CONTR.	3	510	517	5		X			1231
STC MAG TAPE CONTR.	4	500	507	1		X			1224
SYNCHRONOUS MODEM	1	100	107	4	X		X		6
SYNCHRONOUS MODEM	2	110	117	14	X		X		16
SYNCHRONOUS MODEM	3	120	127	20	X		X		30
SYNCHRONOUS MODEM	4	130	137	24	X		X		31
SYNCHRONOUS MODEM	5	140	147	30	X		X		26
SYNCHRONOUS MODEM	6	150	157	34	X		X		27
SYNCHRONOUS MODEM	7	160	167	40	X		X		1042
SYNCHRONOUS MODEM	8	170	177	10	X		X		1043
SYNCHRONOUS MODEM	9	1100	1107	70	X		X		1044
SYNCHRONOUS MODEM	10	1110	1117	44	X		X		1045
SYNCHRONOUS MODEM	11	1120	1127	50	X		X		1046
SYNCHRONOUS MODEM	12	1130	1137	54	X		X		1047
SYNCHRONOUS MODEM	13	1140	1147	60	X		X		1050
SYNCHRONOUS MODEM	14	1150	1157	64	X		X		1051
SYNCHRONOUS MODEM	15	1160	1167	74	X		X		1052
SYNCHRONOUS MODEM	16	1170	1177	75	X		X		1053
TELEX INTERFACE	1	300	307	120	X		X		1
TELEX INTERFACE	2	310	317	121	X		X		11
TELEX INTERFACE	3	320	327	122	X		X		42
TELEX INTERFACE	4	330	337	123	X		X		43
TELEX INTERFACE	5	340	347	44	X		X		44
TELEX INTERFACE	6	350	357	45	X		X		45
TELEX INTERFACE	7	360	367	46	X		X		46
TELEX INTERFACE	8	370	377	47	X		X		47
TELEX INTERFACE	9	1300	1307	50	X		X		60
TELEX INTERFACE	10	1310	1317	51	X		X		61

HARDWARE DEVICE NAME		FIRST DEVNO	LAST DEVNO	IDENT -CODE	INT.LEVEL 10	11	12	13	SINTRAN-III LOG. DEVNO
TELEX INTERFACE	11	1320	1327	52	X		X		62
TELEX INTERFACE	12	1330	1337	53	X		X		63
TELEX INTERFACE	13	1340	1347	54	X		X		64
TELEX INTERFACE	14	1350	1357	55	X		X		65
TELEX INTERFACE	15	1360	1367	56	X		X		66
TELEX INTERFACE	16	1370	1377	57	X		X		67
TELEX INTERFACE	17	200	207	60	X		X		7
TELEX INTERFACE	18	210	217	61	X		X		17
TELEX INTERFACE	19	220	227	62	X		X		52
TELEX INTERFACE	20	230	237	63	X		X		53
TELEX INTERFACE	21	240	247	64	X		X		54
TELEX INTERFACE	22	250	257	65	X		X		55
TELEX INTERFACE	23	260	267	66	X		X		56
TELEX INTERFACE	24	270	277	67	X		X		57
TELEX INTERFACE	25	1200	1207	70	X		X		70
TELEX INTERFACE	26	1210	1217	71	X		X		71
TELEX INTERFACE	27	1220	1227	72	X		X		72
TELEX INTERFACE	28	1230	1237	73	X		X		73
TELEX INTERFACE	29	1240	1247	74	X		X		74
TELEX INTERFACE	30	1250	1257	75	X		X		75
TELEX INTERFACE	31	1260	1267	76	X		X		76
TELEX INTERFACE	32	1270	1277	77	X		X		77
TELEX INTERFACE	33	640	647	124	X		X		1040
TELEX INTERFACE	34	650	657	125	X		X		1041
TELEX INTERFACE	35	660	667	126	X		X		1042
TELEX INTERFACE	36	670	677	127	X		X		1043
TELEX INTERFACE	37	1100	1107	130	X		X		1044
TELEX INTERFACE	38	1110	1117	131	X		X		1045
TELEX INTERFACE	39	1120	1127	132	X		X		1046
TELEX INTERFACE	40	1130	1137	133	X		X		1047
TELEX INTERFACE	41	1140	1147	134	X		X		1050
TELEX INTERFACE	42	1150	1157	135	X		X		1051
TELEX INTERFACE	43	1160	1167	136	X		X		1052
TELEX INTERFACE	44	1170	1177	137	X		X		1053
TELEX INTERFACE	45	1400	1407	140	X		X		1054
TELEX INTERFACE	46	1410	1417	141	X		X		1055
TELEX INTERFACE	47	1420	1427	142	X		X		1056
TELEX INTERFACE	48	1430	1437	143	X		X		1057
TELEX INTERFACE	49	1500	1507	144	X		X		1060
TELEX INTERFACE	50	1510	1517	145	X		X		1061
TELEX INTERFACE	51	1520	1527	146	X		X		1062
TELEX INTERFACE	52	1530	1537	147	X		X		1063
TELEX INTERFACE	53	1640	1647	150	X		X		1064
TELEX INTERFACE	54	1650	1657	151	X		X		1065
TELEX INTERFACE	55	1660	1667	152	X		X		1066
TELEX INTERFACE	56	1670	1677	153	X		X		1067
TELEX INTERFACE	57	1700	1707	154	X		X		1070
TELEX INTERFACE	58	1710	1717	155	X		X		1071
TELEX INTERFACE	59	1720	1727	156	X		X		1072
TELEX INTERFACE	60	1730	1737	157	X		X		1073
TELEX INTERFACE	61	1740	1747	160	X		X		1074
TELEX INTERFACE	62	1750	1757	161	X		X		1075
TELEX INTERFACE	63	1760	1767	162	X		X		1076
TELEX INTERFACE	64	1770	1777	163	X		X		1077

HARDWARE DEVICE NAME		FIRST DEVNO	LAST DEVNO	IDENT -CODE	INT.LEVEL l0	l1	l2	l3	SINTRAN-III LOG. DEVNO
TELEX INTERFACE	65	140400	140407	140040	X		X		2000
TELEX INTERFACE	66	140410	140417	140041	X		X		2001
TELEX INTERFACE	67	140420	140427	140042	X		X		2002
TELEX INTERFACE	68	140430	140437	140043	X		X		2003
TELEX INTERFACE	69	140440	140447	140044	X		X		2004
TELEX INTERFACE	70	140450	140457	140045	X		X		2005
TELEX INTERFACE	71	140460	140467	140046	X		X		2006
TELEX INTERFACE	72	140470	140477	140047	X		X		2007
TELEX INTERFACE	73	140500	140507	140050	X		X		2010
TELEX INTERFACE	74	140510	140517	140051	X		X		2011
TELEX INTERFACE	75	140520	140527	140052	X		X		2012
TELEX INTERFACE	76	140530	140537	140053	X		X		2013
TELEX INTERFACE	77	140540	140547	140054	X		X		2014
TELEX INTERFACE	78	140550	140557	140055	X		X		2015
TELEX INTERFACE	79	140560	140567	140056	X		X		2016
TELEX INTERFACE	80	140570	140577	140057	X		X		2017
TELEX INTERFACE	81	140600	140607	140060	X		X		2020
TELEX INTERFACE	82	140610	140617	140061	X		X		2021
TELEX INTERFACE	83	140620	140627	140062	X		X		2022
TELEX INTERFACE	84	140630	140637	140063	X		X		2023
TELEX INTERFACE	85	140640	140647	140064	X		X		2024
TELEX INTERFACE	86	140650	140657	140065	X		X		2025
TELEX INTERFACE	87	140660	140667	140066	X		X		2026
TELEX INTERFACE	88	140670	140677	140067	X		X		2027
TELEX INTERFACE	89	140700	140707	140070	X		X		2030
TELEX INTERFACE	90	140710	140717	140071	X		X		2031
TELEX INTERFACE	91	140720	140727	140072	X		X		2032
TELEX INTERFACE	92	140730	140737	140073	X		X		2033
TELEX INTERFACE	93	140740	140747	140074	X		X		2034
TELEX INTERFACE	94	140750	140757	140075	X		X		2035
TELEX INTERFACE	95	140760	140767	140076	X		X		2036
TELEX INTERFACE	96	140770	140777	140077	X		X		2037
TELEX INTERFACE	97	141000	141007	140100	X		X		2040
TELEX INTERFACE	98	141010	141017	140101	X		X		2041
TELEX INTERFACE	99	141020	141027	140102	X		X		2042
TELEX INTERFACE	100	141030	141037	140103	X		X		2043
TELEX INTERFACE	101	141040	141047	140104	X		X		2044
TELEX INTERFACE	102	141050	141057	140105	X		X		2045
TELEX INTERFACE	103	141060	141067	140106	X		X		2046
TELEX INTERFACE	104	141070	141077	140107	X		X		2047
TELEX INTERFACE	105	141100	141107	140110	X		X		2050
TELEX INTERFACE	106	141110	141117	140111	X		X		2051
TELEX INTERFACE	107	141120	141127	140112	X		X		2052
TELEX INTERFACE	108	141130	141137	140113	X		X		2053
TELEX INTERFACE	109	141140	141147	140114	X		X		2054
TELEX INTERFACE	110	141150	141157	140115	X		X		2055
TELEX INTERFACE	111	141160	141167	140116	X		X		2056
TELEX INTERFACE	112	141170	141177	140117	X		X		2057
TELEX INTERFACE	113	141200	141207	140120	X		X		2060
TELEX INTERFACE	114	141210	141217	140121	X		X		2061
TELEX INTERFACE	115	141220	141227	140122	X		X		2062
TELEX INTERFACE	116	141230	141237	140123	X		X		2063
TELEX INTERFACE	117	141240	141247	140124	X		X		2064
TELEX INTERFACE	118	141250	141257	140125	X		X		2065

HARDWARE DEVICE NAME		FIRST DEVNO	LAST DEVNO	IDENT -CODE	INT.LEVEL 10	11	12	13	SINTRAN-III LOG. DEVNO
TELEX INTERFACE	119	141260	141267	140126	X		X		2066
TELEX INTERFACE	120	141270	141277	140127	X		X		2067
TELEX INTERFACE	121	141300	141307	140130	X		X		2070
TELEX INTERFACE	122	141310	141317	140131	X		X		2071
TELEX INTERFACE	123	141320	141327	140132	X		X		2072
TELEX INTERFACE	124	141330	141337	140133	X		X		2073
TELEX INTERFACE	125	141340	141347	140134	X		X		2074
TELEX INTERFACE	126	141350	141357	140135	X		X		2075
TELEX INTERFACE	127	141360	141367	140136	X		X		2076
TELEX INTERFACE	128	141370	141377	140137	X		X		2077
TERMINAL INTERFACE	1	300	307	120(1)	X		X		1
TERMINAL INTERFACE	2	310	317	121(5)	X		X		11
TERMINAL INTERFACE	3	320	327	122(6)	X		X		42
TERMINAL INTERFACE	4	330	337	123(7)	X		X		43
TERMINAL INTERFACE	5	340	347	44	X		X		44
TERMINAL INTERFACE	6	350	357	45	X		X		45
TERMINAL INTERFACE	7	360	367	46	X		X		46
TERMINAL INTERFACE	8	370	377	47	X		X		47
TERMINAL INTERFACE	9	1300	1307	50	X		X		60
TERMINAL INTERFACE	10	1310	1317	51	X		X		61
TERMINAL INTERFACE	11	1320	1327	52	X		X		62
TERMINAL INTERFACE	12	1330	1337	53	X		X		63
TERMINAL INTERFACE	13	1340	1347	54	X		X		64
TERMINAL INTERFACE	14	1350	1357	55	X		X		65
TERMINAL INTERFACE	15	1360	1367	56	X		X		66
TERMINAL INTERFACE	16	1370	1377	57	X		X		67
TERMINAL INTERFACE	17	200	207	60	X		X		7
TERMINAL INTERFACE	18	210	217	61	X		X		17
TERMINAL INTERFACE	19	220	227	62	X		X		52
TERMINAL INTERFACE	20	230	237	63	X		X		53
TERMINAL INTERFACE	21	240	247	64	X		X		54
TERMINAL INTERFACE	22	250	257	65	X		X		55
TERMINAL INTERFACE	23	260	267	66	X		X		56
TERMINAL INTERFACE	24	270	277	67	X		X		57
TERMINAL INTERFACE	25	1200	1207	70	X		X		70
TERMINAL INTERFACE	26	1210	1217	71	X		X		71
TERMINAL INTERFACE	27	1220	1227	72	X		X		72
TERMINAL INTERFACE	28	1230	1237	73	X		X		73
TERMINAL INTERFACE	29	1240	1247	74	X		X		74
TERMINAL INTERFACE	30	1250	1257	75	X		X		75
TERMINAL INTERFACE	31	1260	1267	76	X		X		76
TERMINAL INTERFACE	32	1270	1277	77	X		X		77
TERMINAL INTERFACE	33	640	647	124	X		X		1040
TERMINAL INTERFACE	34	650	657	125	X		X		1041
TERMINAL INTERFACE	35	660	667	126	X		X		1042
TERMINAL INTERFACE	36	670	677	127	X		X		1043
TERMINAL INTERFACE	37	1100	1107	130	X		X		1044
TERMINAL INTERFACE	38	1110	1117	131	X		X		1045
TERMINAL INTERFACE	39	1120	1127	132	X		X		1046
TERMINAL INTERFACE	40	1130	1137	133	X		X		1047
TERMINAL INTERFACE	41	1140	1147	134	X		X		1050
TERMINAL INTERFACE	42	1150	1157	135	X		X		1051
TERMINAL INTERFACE	43	1160	1167	136	X		X		1052
TERMINAL INTERFACE	44	1170	1177	137	X		X		1053

HARDWARE DEVICE NAME		FIRST DEVNO	LAST DEVNO	IDENT -CODE	INT.LEVEL 10	11	12	13	SINTRAN-III LOG. DEVNO
TERMINAL INTERFACE	45	1400	1407	140	X		X		1054
TERMINAL INTERFACE	46	1410	1417	141	X		X		1055
TERMINAL INTERFACE	47	1420	1427	142	X		X		1056
TERMINAL INTERFACE	48	1430	1437	143	X		X		1057
TERMINAL INTERFACE	49	1500	1507	144	X		X		1060
TERMINAL INTERFACE	50	1510	1517	145	X		X		1061
TERMINAL INTERFACE	51	1520	1527	146	X		X		1062
TERMINAL INTERFACE	52	1530	1537	147	X		X		1063
TERMINAL INTERFACE	53	1640	1647	150	X		X		1064
TERMINAL INTERFACE	54	1650	1657	151	X		X		1065
TERMINAL INTERFACE	55	1660	1667	152	X		X		1066
TERMINAL INTERFACE	56	1670	1677	153	X		X		1067
TERMINAL INTERFACE	57	1700	1707	154	X		X		1070
TERMINAL INTERFACE	58	1710	1717	155	X		X		1071
TERMINAL INTERFACE	59	1720	1727	156	X		X		1072
TERMINAL INTERFACE	60	1730	1737	157	X		X		1073
TERMINAL INTERFACE	61	1740	1747	160	X		X		1074
TERMINAL INTERFACE	62	1750	1757	161	X		X		1075
TERMINAL INTERFACE	63	1760	1767	162	X		X		1076
TERMINAL INTERFACE	64	1770	1777	163	X		X		1077
TERMINAL INTERFACE	65	140400	140407	140040	X		X		2000
TERMINAL INTERFACE	66	140410	140417	140041	X		X		2001
TERMINAL INTERFACE	67	140420	140427	140042	X		X		2002
TERMINAL INTERFACE	68	140430	140437	140043	X		X		2003
TERMINAL INTERFACE	69	140440	140447	140044	X		X		2004
TERMINAL INTERFACE	70	140450	140457	140045	X		X		2005
TERMINAL INTERFACE	71	140460	140467	140046	X		X		2006
TERMINAL INTERFACE	72	140470	140477	140047	X		X		2007
TERMINAL INTERFACE	73	140500	140507	140050	X		X		2010
TERMINAL INTERFACE	74	140510	140517	140051	X		X		2011
TERMINAL INTERFACE	75	140520	140527	140052	X		X		2012
TERMINAL INTERFACE	76	140530	140537	140053	X		X		2013
TERMINAL INTERFACE	77	140540	140547	140054	X		X		2014
TERMINAL INTERFACE	78	140550	140557	140055	X		X		2015
TERMINAL INTERFACE	79	140560	140567	140056	X		X		2016
TERMINAL INTERFACE	80	140570	140577	140057	X		X		2017
TERMINAL INTERFACE	81	140600	140607	140060	X		X		2020
TERMINAL INTERFACE	82	140610	140617	140061	X		X		2021
TERMINAL INTERFACE	83	140620	140627	140062	X		X		2022
TERMINAL INTERFACE	84	140630	140637	140063	X		X		2023
TERMINAL INTERFACE	85	140640	140647	140064	X		X		2024
TERMINAL INTERFACE	86	140650	140657	140065	X		X		2025
TERMINAL INTERFACE	87	140660	140667	140066	X		X		2026
TERMINAL INTERFACE	88	140670	140677	140067	X		X		2027
TERMINAL INTERFACE	89	140700	140707	140070	X		X		2030
TERMINAL INTERFACE	90	140710	140717	140071	X		X		2031
TERMINAL INTERFACE	91	140720	140727	140072	X		X		2032
TERMINAL INTERFACE	92	140730	140737	140073	X		X		2033
TERMINAL INTERFACE	93	140740	140747	140074	X		X		2034
TERMINAL INTERFACE	94	140750	140757	140075	X		X		2035
TERMINAL INTERFACE	95	140760	140767	140076	X		X		2036
TERMINAL INTERFACE	96	140770	140777	140077	X		X		2037
TERMINAL INTERFACE	97	141000	141007	140100	X		X		2040
TERMINAL INTERFACE	98	141010	141017	140101	X		X		2041

HARDWARE DEVICE NAME		FIRST DEVNO	LAST DEVNO	IDENT -CODE	INT.LEVEL 10	11	12	13	SINTRAN-III LOG. DEVNO
TERMINAL INTERFACE	99	141020	141027	140102	X		X		2042
TERMINAL INTERFACE	100	141030	141037	140103	X		X		2043
TERMINAL INTERFACE	101	141040	141047	140104	X		X		2044
TERMINAL INTERFACE	102	141050	141057	140105	X		X		2045
TERMINAL INTERFACE	103	141060	141067	140106	X		X		2046
TERMINAL INTERFACE	104	141070	141077	140107	X		X		2047
TERMINAL INTERFACE	105	141100	141107	140110	X		X		2050
TERMINAL INTERFACE	106	141110	141117	140111	X		X		2051
TERMINAL INTERFACE	107	141120	141127	140112	X		X		2052
TERMINAL INTERFACE	108	141130	141137	140113	X		X		2053
TERMINAL INTERFACE	109	141140	141147	140114	X		X		2054
TERMINAL INTERFACE	110	141150	141157	140115	X		X		2055
TERMINAL INTERFACE	111	141160	141167	140116	X		X		2056
TERMINAL INTERFACE	112	141170	141177	140117	X		X		2057
TERMINAL INTERFACE	113	141200	141207	140120	X		X		2060
TERMINAL INTERFACE	114	141210	141217	140121	X		X		2061
TERMINAL INTERFACE	115	141220	141227	140122	X		X		2062
TERMINAL INTERFACE	116	141230	141237	140123	X		X		2063
TERMINAL INTERFACE	117	141240	141247	140124	X		X		2064
TERMINAL INTERFACE	118	141250	141257	140125	X		X		2065
TERMINAL INTERFACE	119	141260	141267	140126	X		X		2066
TERMINAL INTERFACE	120	141270	141277	140127	X		X		2067
TERMINAL INTERFACE	121	141300	141307	140130	X		X		2070
TERMINAL INTERFACE	122	141310	141317	140131	X		X		2071
TERMINAL INTERFACE	123	141320	141327	140132	X		X		2072
TERMINAL INTERFACE	124	141330	141337	140133	X		X		2073
TERMINAL INTERFACE	125	141340	141347	140134	X		X		2074
TERMINAL INTERFACE	126	141350	141357	140135	X		X		2075
TERMINAL INTERFACE	127	141360	141367	140136	X		X		2076
TERMINAL INTERFACE	128	141370	141377	140137	X		X		2077
TEST CARD		760	767	100	X	X	X	X	
UNIVERSAL DMA	1	140050	140057	140010		X			2100
UNIVERSAL DMA	2	140060	140067	140011		X			2101
UNIVERSAL DMA	3	140070	140077	140012		X			2102
UNIVERSAL DMA	4	140100	140107	140013		X			2103
UNIVERSAL DMA	5	140110	140117	140014		X			2104
UNIVERSAL DMA	6	140120	140127	140015		X			2105
UNIVERSAL DMA	7	140130	140137	140016		X			2106
UNIVERSAL DMA	8	140140	140147	140017		X			2107
UNIVERSAL DMA	9	140150	140157	140020		X			2110
UNIVERSAL DMA	10	140160	140167	140021		X			2111
UNIVERSAL DMA	11	140170	140177	140022		X			2112
UNIVERSAL DMA	12	140200	140207	140023		X			2113
UNIVERSAL DMA	13	140210	140217	140024		X			2114
UNIVERSAL DMA	14	140220	140227	140025		X			2115
UNIVERSAL DMA	15	140230	140237	140026		X			2116
UNIVERSAL DMA	16	140240	140247	140027		X			2117
UNIVERSAL DMA, Nord-10	1	1400	1407	24		X			400
UNIVERSAL DMA, Nord-10	2	1410	1417	25		X			401
UNIVERSAL DMA, Nord-10	3	1420	1427	26		X			402
UNIVERSAL DMA, Nord-10	4	1430	1437	27		X			403
UNIVERSAL DMA, Nord-10	5	1440	1447	30		X			404
UNIVERSAL DMA, Nord-10	6	1450	1457	31		X			405
UNIVERSAL DMA, Nord-10	7	1460	1467	32		X			406

HARDWARE DEVICE NAME		FIRST DEVNO	LAST DEVNO	IDENT -CODE	INT.LEVEL 10	11	12	13	SINTRAN-III LOG. DEVNO
UNIVERSAL DMA, Nord-10	8	1470	1477	33		X			413
UNIVERSAL DMA, Nord-10	9	1500	1507	34		X			414
UNIVERSAL DMA, Nord-10	10	1510	1517	35		X			415
VERSATEC DMA	1	600	607	4		X			22
VERSATEC DMA	2	1600	1607	14		X			23
VERSATEC PIO	1	600	607	4	X				22
VERSATEC PIO	2	1600	1607	14	X				23
VICOM	1	141460	141467	140146		X			2100
VICOM	2	141470	141477	140147		X			2101
VICOM	3	141500	141507	140150		X			2102
VICOM	4	141510	141517	140151		X			2103
VICOM	5	141520	141527	140152		X			2104
VICOM	6	141530	141537	140153		X			2105
VICOM	7	141540	141547	140154		X			2106
VICOM	8	141550	141557	140155		X			2107
VICOM	9	141560	141567	140156		X			2110
VICOM	10	141570	141577	140157		X			2111
VICOM	11	141600	141607	140160		X			2112
VICOM	12	141610	141617	140161		X			2113
VICOM	13	141620	141627	140162		X			2114
VICOM	14	141630	141637	140163		X			2115
VICOM	15	141640	141647	140164		X			2116
VICOM	16	141650	141657	140165		X			2117
WATCH DOG		1034	1034						

Chapter 2

Power Supply

POWER SUPPLY

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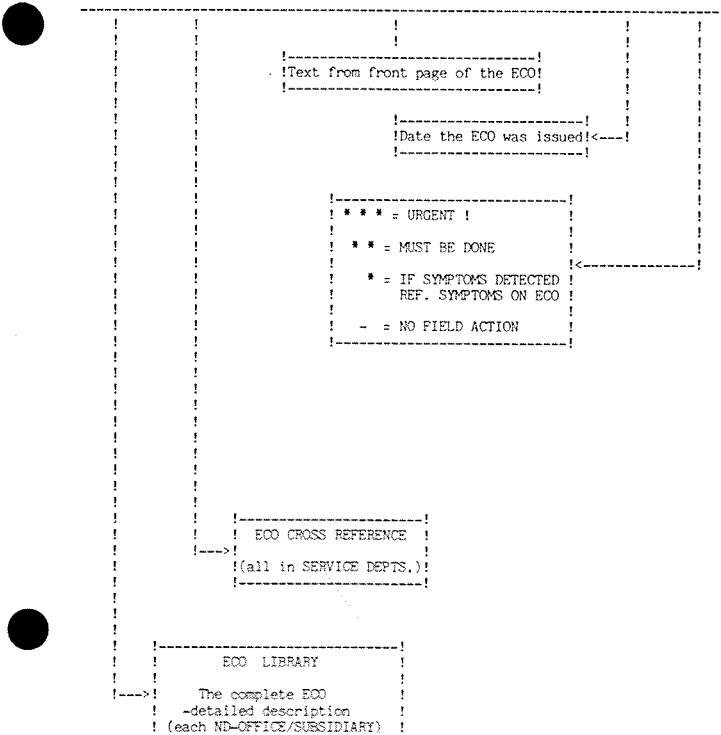
EXPLANATION



ND ECO NO.	VENDOR	Volume-1 SHORT DESCRIPTION	DATE ISSUED	
POWER-001	EMI	When the 12V margin is activated, the alarm is raised.	840123	*
POWER-002	T.SEEM	Ref. ECO:100-340 and ECO:100-341. Provides more accurate power fail adjustment independant of changing CPU.	840322	* *

ND TECH. TIP No.:04 Issued by TF August 09. 1982
STAND-BY POWER SUPPLY

SEEM S 6011 Stand-by Power Supply

SEEM S 601 is a prerelease, but has to be used due to the lack of other stand-by Power.

Symptom: Power fail does not work properly.

Modification: The start cable between the control cable and the stand-by Power has to be modified. Cut wire no. 4 and 7 (see fig. 1).

All other stand-by Power: Cut wire no. 4 (see fig. 2)

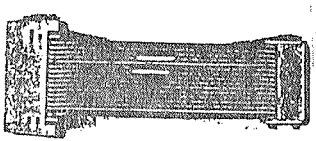


FIG. 1

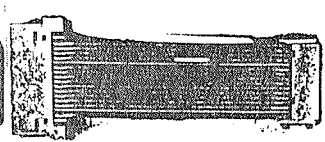


FIG. 2

Chapter 3

Test Programs

TEST PROGRAMS

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TEST PROGRAMS FOR ND-100
ND-10523 C

	PROGRAM		RESP.	DATE	FLOPPY
	100-ERROR-2339	B	TAE	79.05.15	PART 1
	CACHE-2063	D	TAE	81.02.01	PART 3
NEW==>	CONFIGURATION	C	TAE	84.05.14	PART 2
	DIMS-1453	G	SP	83.10.01	PART 2
NEW==>	DISC-TEMA	G	SP	84.05.17	PART 2
	DSERV-1395	A	SP	74.04.16	PART 4
	ECCTEST-2224	B	SP	79.12.05	PART 4
	FL-LOOPS-1996	A	SRK	76.09.23	PART 2
	FLOP-FORM-1990	B	SRK	82.01.15	PART 2
	FLOPPY-FU-1986	G	SRK	83.11.01	PART 2
	FLOPPY-RAN-1988	B	SRK	82.01.15	PART 2
NEW==>	FLOPPY-STREAM	A	SRK	84.05.15	PART 1
	HDLC-MEGALINK	B	TAE	83.02.01	PART 3
	INSTRUCTION	B	TAE	83.11.14	PART 1
	LP-TEST-1878	D	KINE	83.11.01	PART 3
	MEMORY	C	TAE	83.02.01	PART 3
	MOVER-1863	C	TAE	77.04.29	PART 3
	MULTI-1820	P	TAE	82.01.15	PART 2
	PAGING	B	TAE	82.01.15	PART 3
	PARAL-BYTE-1942	C	SP	79.11.08	PART 4
	PASCAN-2226	A	SP	78.06.11	PART 4
	PFAIL-1355	G	TAE	82.01.15	PART 3
	RTC-12-1902	B	TAE	79.05.15	PART 4
	SMALL-RAND-2448	A	SP	81.02.01	PART 3
	STC-RUNNER-2410	B	ANY	80.07.11	PART 1
	STC-TEST-2411	E	ANY	80.10.30	PART 1
NEW==>	SUPER-RAND-2222	E	SP	84.03.30	PART 2
	SYNC-MODEM	A	ANY	83.11.01	PART 3
	TANB-MAG-1559	H	ANY	83.02.01	PART 4
	TECOD-1451	E	SP	80.07.03	PART 4
	TERMINAL-ASYNC	D	SP	83.11.01	PART 2
	TET2200	A	TAE	81.06.01	PART 4
	TNCT-2039	B	TAE	83.02.01	PART 4
NEW==>	UNIVERSAL-DMA	B	ANY	84.01.15	PART 4
	VERSATEST-2297	C	SP	83.02.01	PART 4
	WINCH-RAND	A	SP	83.11.01	PART 1

TEST PROGRAMS FOR NORD 10/12
ND-10522 B

PROGRAM		RESP.	DATE	FLOPPY
1158-SIMPL-2219	A	SP	78.05.31	PART 1
BIG-RAND-1876	C	SP	78.05.30	PART 1
CACHE-2063	D	TAE	81.02.01	PART 3
CARDR-1642	A	SP	75.04.17	PART 1
CONFIGURATION	B	TAE	83.11.01	PART 2
DIMS-1453	G	SP	83.11.01	PART 2
DISC-TEMA	F	SP	83.11.01	PART 2
DRUMS-1297	A	SP	74.01.15	PART 1
DSERV-1395	A	SP	74.04.16	PART 4
ECCTEST-2224	B	SP	79.12.05	PART 4
ERRCOR-2112	A	SP	77.06.09	PART 1
ES-PICT-2216	A	SP	78.05.30	PART 1
EXTEN-ONE-1519	B	SP	77.09.15	PART 1
FL-LOOPS-1996	A	SRK	76.09.23	PART 2
FLOATING-1529	D	SP	79.05.15	PART 1
FLOP-FORM-1990	B	SRK	82.01.15	PART 2
FLOPPY-FU-1986	G	SRK	83.11.01	PART 2
FLOPPY-RAN-1988	B	SRK	82.01.15	PART 2
FOUR-CH-1418	E	SP	80.12.15	PART 1
HDLC-MEGALINK	B	TAE	83.02.01	PART 3
HPMAG-1523	C	SP	76.03.31	PART 1
INTER-T-2233	A	SP	79.01.12	PART 1
LP-TEST-1878	D	KINE	83.11.01	PART 3
MEMORY	C	TAE	83.02.01	PART 3
MOVER-1863	C	TAE	77.04.29	PART 3
MULTI-1820	P	TAE	82.01.15	PART 2
ONE-CHECK-1192	A	SP	73.08.01	PART 1
PAGING	B	TAE	82.01.15	PART 3
PARAL-BYTE-1942	C	SP	79.11.08	PART 4
PASCAN-2226	A	SP	78.06.11	PART 4
PFAIL-12-1940	B	SP	77.05.02	PART 1
PFAIL-1355	G	TAE	82.01.15	PART 3
PROCES-PAN-1865	A	SP	75.10.16	PART 1
RQCHK-1543	D	SP	82.01.15	PART 1
RTC-12-1902	B	TAE	79.05.15	PART 4

TEST PROGRAMS FOR NORD 10/12
ND-10522 B

PROGRAM		RESP.	DATE	FLOPPY
SMALL-RAND-2448	A	SP	81.02.01	PART 3
SUPER-RAND-2222	D	SP	83.11.01	PART 2
SYNC-MODEM	A	ANY	83.11.01	PART 3
T-32B-FLOA-1860	B	SP	80.02.28	PART 1
TANB-MAG-1559	H	ANY	83.02.01	PART 4
TCODR-1299	A	SP	74.04.17	PART 1
TECOD-1451	E	SP	80.07.03	PART 4
TERMINAL-ASYNC	D	SP	83.11.01	PART 2
TESTMONO-1534	A	SP	74.11.15	PART 1
TET2200	A	TAE	81.06.01	PART 4
THREE-CH-1528	D	SP	80.10.08	PART 1
TNCT-2039	B	TAE	83.02.01	PART 4
TREAL-1399	B	TAE	76.02.10	PART 1
TREPU-1269	C	SP	79.11.08	PART 1
TSTAD-1870	B	SP	76.08.04	PART 1
TWO-CHECK-1190	A	SP	73.08.01	PART 1
UNIVERSAL-DMA	C	ANY	83.11.01	PART 4
VERSATEST-2297	C	SP	83.02.01	PART 4

TEST PROGRAMS FOR ND-500
ND-10321 D

PROGRAM		RESP.	DATE	FLOPPY
PREEF	D	TAE	82.03.04	ND-10321 D
ARITH	C	TAE	81.12.24	ND-10321 D
ADDIT	A	TAE	81.12.24	ND-10321 D
TRAPT	D	TAE	82.03.04	ND-10321 D
EXTRA	C	TAE	81.12.24	ND-10321 D
GMOFF	C	TAE	81.12.24	ND-10321 D
GMENT	C	TAE	81.12.24	ND-10321 D
COMTE	C	TAE	81.12.24	ND-10321 D
SLICE	C	TAE	81.12.24	ND-10321 D
MPEST	C	TAE	81.12.24	ND-10321 D
STMIC	C	TAE	81.12.24	ND-10321 D
HAREM	C	TAE	81.12.24	ND-10321 D
MEMIC	C	TAE	81.12.24	ND-10321 D

TEST PROGRAMS FOR NORD-50
ND-10112 C

PROGRAM		RESP.	DATE	FLOPPY
DFTEST-2465	A		81.03.01	ND-10112 C
FTEST-2466	A		81.02.02	ND-10112 C
HAMB-MET-2464	A		81.03.01	ND-10112 C
IRMD-2469	A		81.03.01	ND-10112 C
ITEST-2467	A		81.03.01	ND-10112 C
JTID-2468	A		81.03.01	ND-10112 C
N50INITIALIZE	A		81.03.01	ND-10112 C
N50-T-SYS-1893	A		76.01.01	ND-10112 C
N50TEST-BATCH	A		81.03.01	ND-10112 C
N50TESTP-ASCOL	A		81.03.01	ND-10112 C
SEKUND-2463	A		81.03.01	ND-10112 C
TCOR-DATA-2470	A		81.03.01	ND-10112 C
TCOR-NGO-2462	A		81.03.01	ND-10112 C
TINST-50-1840	A		75.10.22	ND-10112 C
TMEM-50-1841	A		75.10.22	ND-10112 C
TREG-50-1842	A		75.10.22	ND-10112 C
ND50-MEMORY	A	JB	83.06.17	ND-10112 C

KNOWN BUT NOT CORRECTED ERRORS IN TEST-PROGRAMS.

ISSUED: 8 MAY 1983

When other errors than the ones listed here are found, please report to : Tore Ledel Sivertzen, Technical Support, ND-Norway.

	PROGRAM NAME	DESCRIPTION
	DISC-TEMA-D	FUNCTION will destroy reallocated tracks on the last cylinder (More than half of the reallocation area used.).
NEW==>		The error message Impossible to clear PID Bit 13 will appear without no reason in the beginning of a command. This is often due to a previous ESCAPE.
	HDLC-MEGALINK-B	LOOP-TEST between two MEGALINKs in the same machine. This does not function when running at 983kbaud.
NEW==>	LP-TEST-D	In COLUMN-TEST the input of the second parameter (TO) is by an error expected to be Octal.
NEW==>		Device nos. 164, 174 and 434 will become 160, 170 and 430. PLACE the program and do the following patch: 17711/004367 0 Then start the program with !.
	T-32B-FLOA-1860B	NORD-10 with 1023-1K-PROM. The program will give an error-message in the floating-division test no. 9 (FDV 09). This is due to different rounding.
	TREPU-1269C	Only Reader or only Punch. The program expects that both Reader and Punch interface are present in the machine. If only Punch is present Place the program and patch: 23/135057 0 If only Reader: 24/135057 0 Then start program with !

TEST PROGRAMS

TABLE OF CONTENTS

Date: 840731

SOFTWARE SYSTEM REPORTS for Testprograms for ND-100 Prodcode: 10523C

REPORT-NO	DATE WRITTEN	REA-SON	SUBJECT:
2	840613	I	FLOPPY-STREAM-A Known but not corrected errors.
1	840613	I	DISC-TEMA-G Known but not corrected errors.

NORSK DATA A.S	SOFTWARE SYSTEM REPORT
DATE: 840613	PRODUCT NAME: Testprograms for ND-100 PRODUCT CODE: 10523C REPORT NO: 1
REASON (I/M/E/F/N): I	PROGRAM: DISC-TEMA-G
SUBJECT: DISC-TEMA-G Known but not corrected errors.	
SYMPTOM:	
DESCRIPTION:	

1. PROGRAM STATUS, Marginal recovery.
   The amount for marginal recovery is wrong. The number should be binary shifted 2 bits to the left.

Patch:	Address	Old value	New value
	014317/	156570	156566

2. READING PARAMETERS, AMOUNT.
   When the program asks for amount, the default value may be greater than the upper limit. If then the default value is given, the program accepts it and anything could happen.

Patch:	Address	Old value	New value
	050460/	130003	130403

3. FUNCTION on DISC-140MB.
   In the Status Bit Test, bit 5 and 6 fail, because of a too short delay.

Patch:	Address	Old value	New value
	036640/	1700776	170774

4. FUNCTION on DISC-450MB.
   In the Status Bit Test, bit 6 fails.

Patch:	Address	Old value	New value
	041707/	010000	030000

NORSK DATA A.S SOFTWARE SYSTEM REPORT	
DATE: 840613	PRODUCT NAME: Testprograms for ND-100 PRODUCT CODE: 10523C REPORT NO: 2
REASON (I/M/E/F/N): I	PROGRAM: FLOPPY-STREAM-A
SUBJECT: FLOPPY-STREAM-A Known but not corrected errors.	
SYMPTOM:	
DESCRIPTION:	

1. Reading of floppy format.

   At start and restart of the program, the floppy format found is always 0. The floppy format may be read correctly by using the command >INFO READ-FORMAT

2. Status printout for STATUS 2.

   The status 2 is equal to status 1 error code, but in controller status, status 2 is correct. Use the command >INFO READ-EXTENDED-STATUS where status 2 is correct.

3. Sector amount on double sided diskettes.

   Max and default amount of sectors on double sided diskettes is too large. The logical sector address is one track too high for max address. To correct this, use this patch :

patch :	Address	Old value	New value
	034004/	000233	000232

4. Reading of extended status for floppy.

   If a logical address larger than the floppy is used before executing the command, the error 30 : Track out of range, will appear when reading extended status in the command :

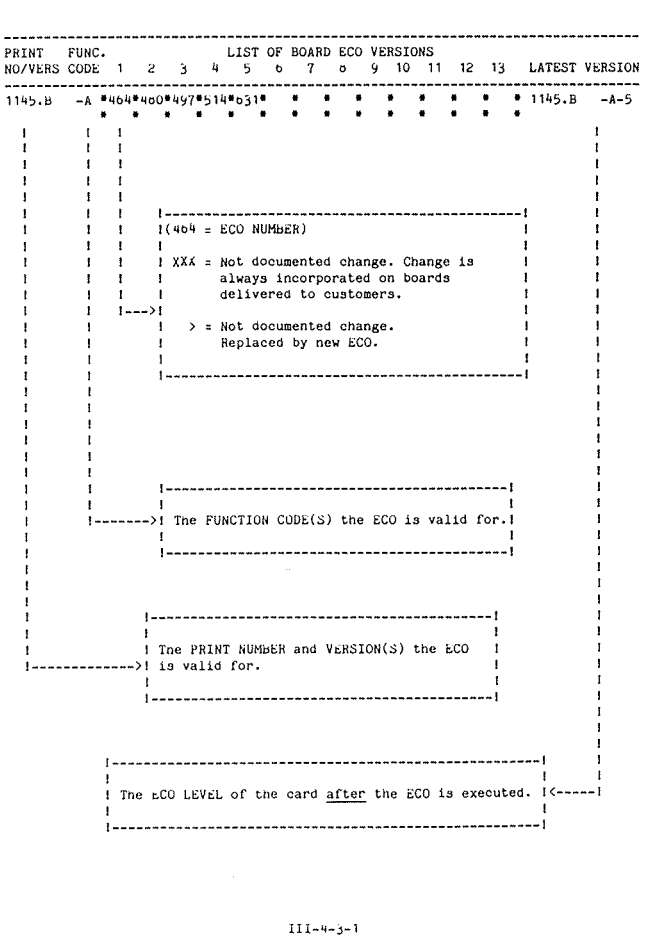
   >INFO READ-EXTENDED-STATUS

5. Logical page address.

Any logical page address printed out for floppy is wrong.

In commands >CHECK-FLOPPY/CARTRIDGE
>INFO TRANSLATE-TO-LOGICAL-ADDRESS

EXPLANATION



PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
1001-	-A	*001*189*	*	*	*	*	*	*	*	*	*	*	*	*	1001- -A-2
-II	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1001-II -A-0
1002-	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1002- -A-0
1003-	-A	*002*003*226*	*	*	*	*	*	*	*	*	*	*	*	*	1003- -A-3
-II	-A	*003*226*	*	*	*	*	*	*	*	*	*	*	*	*	1003-II -A-2
-III	-A	*114*202*226*	*	*	*	*	*	*	*	*	*	*	*	*	1003-III -A-3
1004-	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1004- -A-0
1005-	-A	*004*109*149*396*	*	*	*	*	*	*	*	*	*	*	*	*	1005- -A-4
	-B	*004*109*149*254*396*	*	*	*	*	*	*	*	*	*	*	*	*	1005- -B-5
	-C	*004*109*149*353*396*	*	*	*	*	*	*	*	*	*	*	*	*	1005- -C-5
	-D	*004*109*149*254*353*396*	*	*	*	*	*	*	*	*	*	*	*	*	1005- -D-6
-II	-A	*116*149*210*396*	*	*	*	*	*	*	*	*	*	*	*	*	1005-II -A-4
	-B	*116*149*210*254*396*	*	*	*	*	*	*	*	*	*	*	*	*	1005-II -B-5
	-C	*116*149*210*353*396*	*	*	*	*	*	*	*	*	*	*	*	*	1005-II -C-5
	-D	*116*149*210*254*353*396*	*	*	*	*	*	*	*	*	*	*	*	*	1005-II -D-6
-III	-A	*396 *	*	*	*	*	*	*	*	*	*	*	*	*	1005-III -A-1
	-B	*254*396*	*	*	*	*	*	*	*	*	*	*	*	*	1005-III -B-2
	-C	*353*396*	*	*	*	*	*	*	*	*	*	*	*	*	1005-III -C-2
	-D	*254*353*396*	*	*	*	*	*	*	*	*	*	*	*	*	1005-III -D-3
-IV	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1005-IV -A-0
	-B	*254*	*	*	*	*	*	*	*	*	*	*	*	*	1005-IV -B-1
	-C	*353*	*	*	*	*	*	*	*	*	*	*	*	*	1005-IV -C-1
	-D	*254*353*	*	*	*	*	*	*	*	*	*	*	*	*	1005-IV -D-2
-V	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1005-V -A-0
	-B	*254*	*	*	*	*	*	*	*	*	*	*	*	*	1005-V -B-1
	-C	*353*	*	*	*	*	*	*	*	*	*	*	*	*	1005-V -C-1
	-D	*254*353*	*	*	*	*	*	*	*	*	*	*	*	*	1005-V -D-2
1006-	-A	*006*075*	*	*	*	*	*	*	*	*	*	*	*	*	1006- -A-2
-II	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1006-II -A-0
-III	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1006-III -A-0
-IV	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1006-IV -A-0
1007-	-A	*006*007*008*212*	*	*	*	*	*	*	*	*	*	*	*	*	1007- -A-4
	-S	*006*007*008*212*403*	*	*	*	*	*	*	*	*	*	*	*	*	1007- -S-5
-II	-A	*008*212*	*	*	*	*	*	*	*	*	*	*	*	*	1007-II -A-2
	-S	*008*212*403*	*	*	*	*	*	*	*	*	*	*	*	*	1007-II -S-3
-III	-A	*173*178*212*	*	*	*	*	*	*	*	*	*	*	*	*	1007-III -A-3
	-S	*173*178*212*403*	*	*	*	*	*	*	*	*	*	*	*	*	1007-III -S-4
-IV	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1007-IV -A-0
	-S	*403*	*	*	*	*	*	*	*	*	*	*	*	*	1007-IV -S-1
-V	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1007-V -A-0
	-S	*403*	*	*	*	*	*	*	*	*	*	*	*	*	1007-V -S-1
1008-	-A	*009*257*	*	*	*	*	*	*	*	*	*	*	*	*	1008- -A-2
-II	-A	*257*	*	*	*	*	*	*	*	*	*	*	*	*	1008-II -A-1
1009-	-A	*010*126*	*	*	*	*	*	*	*	*	*	*	*	*	1009- -A-2
1010-	-A	*011*012*195*	*	*	*	*	*	*	*	*	*	*	*	*	1010- -A-3
-II	-A	*012*014*195*	*	*	*	*	*	*	*	*	*	*	*	*	1010-II -A-3
-III	-A	*014*195*	*	*	*	*	*	*	*	*	*	*	*	*	1010-III -A-2
-IV	-A	*195*	*	*	*	*	*	*	*	*	*	*	*	*	1010-IV -A-1
-V	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1010-V -A-0
-VI	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1010-VI -A-0
1011-	-A	*013*	*	*	*	*	*	*	*	*	*	*	*	*	1011- -A-1
	-B	*013*015*	*	*	*	*	*	*	*	*	*	*	*	*	1011- -B-2
-II	-A	*204*	*	*	*	*	*	*	*	*	*	*	*	*	1011-II -A-1
	-B	*015*204*	*	*	*	*	*	*	*	*	*	*	*	*	1011-II -B-2
1012-	-A	*016*059*	*	*	*	*	*	*	*	*	*	*	*	*	1012- -A-2
	-B	*016*059*	*	*	*	*	*	*	*	*	*	*	*	*	1012- -B-2
-II	-A	*059*099*	*	*	*	*	*	*	*	*	*	*	*	*	1012-II -A-2

NORD-10 ECO CROSS REFRENCE
DATE: 850130

PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
	-B	*059*099*	*	*	*	*	*	*	*	*	*	*	*	*	1012-II -B-2
1013-	-A	*017*018*144*	*	*	*	*	*	*	*	*	*	*	*	*	1013- -A-3
	-B	*017*018*144*381*	*	*	*	*	*	*	*	*	*	*	*	*	1013- -B-4
-II	-A	*018*144*	*	*	*	*	*	*	*	*	*	*	*	*	1013-II -A-2
	-B	*018*144*381*	*	*	*	*	*	*	*	*	*	*	*	*	1013-II -B-3
-III	-A	*144*197*	*	*	*	*	*	*	*	*	*	*	*	*	1013-III -A-2
	-B	*144*197*381*	*	*	*	*	*	*	*	*	*	*	*	*	1013-III -B-3
-IV	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1013-IV -A-0
	-B	*381*	*	*	*	*	*	*	*	*	*	*	*	*	1013-IV -B-1
-V	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1013-V -A-0
	-B	*381*	*	*	*	*	*	*	*	*	*	*	*	*	1013-V -B-1
1014-	-A	*019*	*	*	*	*	*	*	*	*	*	*	*	*	1014- -A-1
-II	-A	*019*	*	*	*	*	*	*	*	*	*	*	*	*	1014-II -A-1
-III	-A	*126*	*	*	*	*	*	*	*	*	*	*	*	*	1014-III -A-1
-IV	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1014-IV -A-0
1015-	-A	*020*105*132*471*	*	*	*	*	*	*	*	*	*	*	*	*	1015- -A-4
-II	-A	*105*260*471*	*	*	*	*	*	*	*	*	*	*	*	*	1015-II -A-3
-III	-A	*471*	*	*	*	*	*	*	*	*	*	*	*	*	1015-III -A-1
-IV	-A	*471*	*	*	*	*	*	*	*	*	*	*	*	*	1015-IV -A-1
.E	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1015.E -A-0
1016-	-A	*021*146*293*	*	*	*	*	*	*	*	*	*	*	*	*	1016- -A-3
-II	-A	*293*	*	*	*	*	*	*	*	*	*	*	*	*	1016-II -A-1
-III	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1016-III -A-0
1017-	-A	*022*058*151*344*470*	*	*	*	*	*	*	*	*	*	*	*	*	1017- -A-5
-II	-A	*344*470*	*	*	*	*	*	*	*	*	*	*	*	*	1017-II -A-2
-III	-A	*344*470*	*	*	*	*	*	*	*	*	*	*	*	*	1017-III -A-2
1018-	-A	*023*088*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018- -A-3
	-B	*023*088*280*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018- -B-4
	-C	*023*088*280*366*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018- -C-5
-II	-A	*024*053*076*088*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-II -A-5
	-B	*024*053*076*088*280*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-II -B-6
	-C	*024*053*076*088*280*366*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-II -C-7
-III	-A	*077*088*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-III -A-3
	-B	*077*088*280*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-III -B-4
	-C	*077*088*280*366*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-III -C-5
-V	-A	*172*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-V -A-2
	-B	*172*280*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-V -B-3
	-C	*172*280*366*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-V -C-4
-VI	-A	*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-VI -A-1
	-B	*280*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-VI -B-2
	-C	*280*366*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-VI -C-3
	-D	*280*366*616*665*	*	*	*	*	*	*	*	*	*	*	*	*	1018-VI -D-4
VII	-A	*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-VII -A-1
	-B	*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-VII -B-1
	-C	*366*616*	*	*	*	*	*	*	*	*	*	*	*	*	1018-VII -C-2
	-D	*366*616*665*	*	*	*	*	*	*	*	*	*	*	*	*	1018-VII -D-3
1019-	-A	*025*026*104*170*	*	*	*	*	*	*	*	*	*	*	*	*	1019- -A-4
	-B	*025*026*104*170*224*	*	*	*	*	*	*	*	*	*	*	*	*	1019- -B-5
	-C	*025*026*104*170*491*	*	*	*	*	*	*	*	*	*	*	*	*	1019- -C-5
-II	-A	*170*220*	*	*	*	*	*	*	*	*	*	*	*	*	1019-II -A-2
	-B	*170*220*224*	*	*	*	*	*	*	*	*	*	*	*	*	1019-II -B-3
	-C	*170*220*491*	*	*	*	*	*	*	*	*	*	*	*	*	1019-II -C-3
-III	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1019-III -A-0
	-B	*224*	*	*	*	*	*	*	*	*	*	*	*	*	1019-III -B-1
	-C	*491*	*	*	*	*	*	*	*	*	*	*	*	*	1019-III -C-1
-IV	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1019-IV -A-0
	-B	*224*	*	*	*	*	*	*	*	*	*	*	*	*	1019-IV -B-1

PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
	-C	*491*	*	*	*	*	*	*	*	*	*	*	*	*	1019-IV -C-1
1020-	-A	*027*028*100*163*181*327*413*582*617*									*	*	*	*	1020- -A-9
	-B	*027*028*100*163*181*245*327*413*582*617*									*	*	*	*	1020- -B-10
-II	-A	*028*082*100*112*163*181*327*413*582*617*									*	*	*	*	1020-II -A-10
	-B	*028*082*100*112*163*181*245*327*413*582*617*									*	*	*	*	1020-II -B-11
-III	-A	*163*181*327*413*582*617*					*	*	*	*	*	*	*	*	1020-III -A-6
	-B	*163*181*245*327*413*582*617*					*	*	*	*	*	*	*	*	1020-III -B-7
-IV	-A	*327*413*582*617*					*	*	*	*	*	*	*	*	1020-IV -A-4
	-B	*245*327*413*582*617*					*	*	*	*	*	*	*	*	1020-IV -B-5
1021-	-A	*057*102*139*			*	*	*	*	*	*	*	*	*	*	1021- -A-3
	-B	*057*102*139*321*			*	*	*	*	*	*	*	*	*	*	1021- -B-4
-II	-A	*139*	*	*	*	*	*	*	*	*	*	*	*	*	1021-II -A-1
	-B	*139*321*	*	*	*	*	*	*	*	*	*	*	*	*	1021-II -B-2
-III	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1021-III -A-0
	-B	*321*	*	*	*	*	*	*	*	*	*	*	*	*	1021-III -B-1
-IV	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1021-IV -A-0
	-B	*321*	*	*	*	*	*	*	*	*	*	*	*	*	1021-IV -B-1
1022-	-A	*029*051*081*107*311*376*461*					*	*	*	*	*	*	*	*	1022- -A-7
	-B	*029*051*081*107*285*311*376*461*					*	*	*	*	*	*	*	*	1022- -B-8
-II	-A	*107*311*376*461*			*	*	*	*	*	*	*	*	*	*	1022-II -A-4
	-B	*107*285*311*376*461*			*	*	*	*	*	*	*	*	*	*	1022-II -B-5
-III	-A	*107*311*376*461*			*	*	*	*	*	*	*	*	*	*	1022-III -A-4
	-B	*107*285*311*376*461*			*	*	*	*	*	*	*	*	*	*	1022-III -B-5
-IV	-A	*101*107*311*376*461*			*	*	*	*	*	*	*	*	*	*	1022-IV -A-5
	-B	*101*107*285*311*376*461*			*	*	*	*	*	*	*	*	*	*	1022-IV -B-6
-V	-A	*107*133*311*376*461*			*	*	*	*	*	*	*	*	*	*	1022-V -A-5
	-B	*107*133*285*311*376*461*			*	*	*	*	*	*	*	*	*	*	1022-V -B-6
-VI	-A	*107*311*376*461*			*	*	*	*	*	*	*	*	*	*	1022-VI -A-4
	-B	*107*285*311*376*461*			*	*	*	*	*	*	*	*	*	*	1022-VI -B-5
.G	-A	*461*	*	*	*	*	*	*	*	*	*	*	*	*	1022.G -A-1
	-B	*285*461*	*	*	*	*	*	*	*	*	*	*	*	*	1022.G -B-2
1023-	-A	*030*	*	*	*	*	*	*	*	*	*	*	*	*	1023- -A-1
	-B	*030*360*	*	*	*	*	*	*	*	*	*	*	*	*	1023- -B-2
	-C	*030*380*	*	*	*	*	*	*	*	*	*	*	*	*	1023- -C-2
	-T	*030*449*	*	*	*	*	*	*	*	*	*	*	*	*	1023- -T-2
-II	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1023-II -A-0
	-B	*360*	*	*	*	*	*	*	*	*	*	*	*	*	1023-II -B-1
	-C	*380*	*	*	*	*	*	*	*	*	*	*	*	*	1023-II -C-1
	-T	*449*	*	*	*	*	*	*	*	*	*	*	*	*	1023-II -T-1
1024-	-A	*031*113*115*370*					*	*	*	*	*	*	*	*	1024- -A-4
-II	-A	*113*115*370*					*	*	*	*	*	*	*	*	1024-II -A-3
-IV	-A	*370*					*	*	*	*	*	*	*	*	1024-IV -A-1
.G	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1024.G -A-0
1025-	-A	*032*033*054*060*141*142*218*255*642*									*	*	*	*	1025- -A-8
-II	-A	*033*054*060*141*142*196*218*255*642*									*	*	*	*	1025-II -A-9
-III	-A	*060*141*142*196*218*255*642*							*	*	*	*	*	*	1025-III -A-7
-IV	-A	*141*252*255*643*					*	*	*	*	*	*	*	*	1025-IV -A-4
-V	-A	*644*	*	*	*	*	*	*	*	*	*	*	*	*	1025-V -A-1
1026-	-A	*034*066*087*180*					*	*	*	*	*	*	*	*	1026- -A-4
	-B	*034*066*067*087*180*					*	*	*	*	*	*	*	*	1026- -B-5
	-C	*034*066*087*180*294*					*	*	*	*	*	*	*	*	1026- -C-5
	-D	*034*066*084*087*180*					*	*	*	*	*	*	*	*	1026- -D-5
-II	-A	*066*087*180*			*	*	*	*	*	*	*	*	*	*	1026-II -A-3
	-B	*066*067*087*180*			*	*	*	*	*	*	*	*	*	*	1026-II -B-4
	-C	*066*087*180*294*			*	*	*	*	*	*	*	*	*	*	1026-II -C-4
	-D	*066*084*087*180*			*	*	*	*	*	*	*	*	*	*	1026-II -D-4
-III	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1026-III -A-0

PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
	-B	*067*	*	*	*	*	*	*	*	*	*	*	*	*	1026-III -B-1
	-C	*294*	*	*	*	*	*	*	*	*	*	*	*	*	1026-III -C-1
	-D	*084*	*	*	*	*	*	*	*	*	*	*	*	*	1026-III -D-1
-IV	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1026-IV -A-0
	-B	*067*	*	*	*	*	*	*	*	*	*	*	*	*	1026-IV -B-1
	-C	*294*	*	*	*	*	*	*	*	*	*	*	*	*	1026-IV -C-1
	-D	*084*	*	*	*	*	*	*	*	*	*	*	*	*	1026-IV -D-1
1027-	-A	*035*036*037*064*092*214*261*297*329*									*	*	*	*	1027- -A-9
	-B	*035*036*037*038*064*092*214*261*297*									*	*	*	*	1027- -B-9
-II	-A	*036*037*064*092*261*297*329*								*	*	*	*	*	1027-II -A-7
	-B	*036*037*038*064*092*261*297*329*								*	*	*	*	*	1027-II -B-8
-III	-A	*037*064*092*261*297*329*								*	*	*	*	*	1027-III -A-6
	-B	*037*038*064*092*261*297*329*								*	*	*	*	*	1027-III -B-7
-IV	-A	*064*117*182*214*261*297*329*								*	*	*	*	*	1027-IV -A-7
	-B	*064*117*182*214*261*297*329*586*								*	*	*	*	*	1027-IV -B-8
-V	-A	*261*297*329*								*	*	*	*	*	1027-V -A-3
	-B	*261*297*329*586*								*	*	*	*	*	1027-V -B-4
-VI	-A	*261*297*329*								*	*	*	*	*	1027-VI -A-3
	-B	*261*297*329*586*								*	*	*	*	*	1027-VI -B-4
-VII	-A	*261*297*329*								*	*	*	*	*	1027-VII -A-3
	-B	*261*297*329*586*								*	*	*	*	*	1027-VII -B-4
-VIII	-A	*329*								*	*	*	*	*	1027-VIII-A-1
	-B	*329*586*								*	*	*	*	*	1027-VIII-B-2
1028-	-A	*039*052*055*063*122*								*	*	*	*	*	1028- -A-5
-II	-A	*052*055*122*								*	*	*	*	*	1028-II -A-3
1029-	-A	*040*041*129*217*223*234*								*	*	*	*	*	1029- -A-6
-II	-A	*083*121*130*217*223*234*								*	*	*	*	*	1029-II -A-6
-III	-A	*083*121*130*183*217*223*234*								*	*	*	*	*	1029-III -A-7
-IV	-A	*083*121*130*183*217*223*234*								*	*	*	*	*	1029-IV -A-7
-V	-A	* *								*	*	*	*	*	1029-V -A-0
1030-	-A	*042*043*062*085*086*238*								*	*	*	*	*	1030- -A-6
-II	-A	*043*086*091*120*238*								*	*	*	*	*	1030-II -A-5
1031-	-A	*044*	*	*	*	*	*	*	*	*	*	*	*	*	1031- -A-1
-II	-A	*119*	*	*	*	*	*	*	*	*	*	*	*	*	1031-II -A-1
-III	-A	*198*	*	*	*	*	*	*	*	*	*	*	*	*	1031-III -A-1
-IV	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1031-IV -A-0
1032-	-A	*116*235*	*	*	*	*	*	*	*	*	*	*	*	*	1032- -A-2
-II	-A	*116*235*	*	*	*	*	*	*	*	*	*	*	*	*	1032-II -A-2
-IV	-A	*262*	*	*	*	*	*	*	*	*	*	*	*	*	1032-IV -A-1
-V	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1032-V -A-0
1033-	-A	*045*046*061*105*216*331*								*	*	*	*	*	1033- -A-6
-II	-A	*046*216*331*	*	*	*	*	*	*	*	*	*	*	*	*	1033-II -A-3
-III	-A	*179*200*215*216*331*								*	*	*	*	*	1033-III -A-5
	-T	*179*200*215*216*331*418*								*	*	*	*	*	1033-III -T-6
-IV	-A	*331*	*	*	*	*	*	*	*	*	*	*	*	*	1033-IV -A-1
	-T	*331*418*	*	*	*	*	*	*	*	*	*	*	*	*	1033-IV -T-2
1034-	-A	*110*174*	*	*	*	*	*	*	*	*	*	*	*	*	1034- -A-2
-II	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1034-II -A-0
-III	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1034-III -A-0
1035-	-A	*047*048*056*103*131*207*241*								*	*	*	*	*	1035- -A-7
-II	-A	*048*056*103*124*131*171*207*241*								*	*	*	*	*	1035-II -A-6
1036-	-A	*069*070*074*095*								*	*	*	*	*	1036- -A-4
-II	-A	*095*237*	*	*	*	*	*	*	*	*	*	*	*	*	1036-II -A-2
-III	-A	*237*	*	*	*	*	*	*	*	*	*	*	*	*	1036-III -A-1
-IV	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1036-IV -A-0
1037-	-A	*071*072*073*089*090*106*159*161*213*225*354*369*												*	1037- -A-12
-II	-A	*089*106*159*161*213*225*322*354*369*											*	*	1037-II -A-9

PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
-III	-A	*225*	322*	354*	369*	*	*	*	*	*	*	*	*	*	1037-III -A-4
-IV	-A	*225*	322*	354*	369*	*	*	*	*	*	*	*	*	*	1037-IV -A-4
-V	-A	*322*	354*	369*	*	*	*	*	*	*	*	*	*	*	1037-V -A-3
-VI	-A	*354*	369*	*	*	*	*	*	*	*	*	*	*	*	1037-VI -A-2
-VII	-A	*393*	*	*	*	*	*	*	*	*	*	*	*	*	1037-VII -A-1
1038-	-A	*049*	068*	145*	153*	160*	166*	266*	*	*	*	*	*	*	1038- -A-7
-II	-A	*094*	145*	153*	160*	166*	266*	*	*	*	*	*	*	*	1038-II -A-6
-III	-A	*266*	*	*	*	*	*	*	*	*	*	*	*	*	1038-III -A-1
-IV	-A	*266*	*	*	*	*	*	*	*	*	*	*	*	*	1038-IV -A-1
1039-	-A	*050*	093*	154*	155*	201*	*	*	*	*	*	*	*	*	1039- -A-5
-II	-A	*093*	154*	155*	201*	*	*	*	*	*	*	*	*	*	1039-II -A-4
-III	-A	*201*	*	*	*	*	*	*	*	*	*	*	*	*	1039-III -A-1
-IV	-A	*201*	*	*	*	*	*	*	*	*	*	*	*	*	1039-IV -A-1
-V	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1039-V -A-0
1040-II	-A	*140*	148*	289*	301*	*	*	*	*	*	*	*	*	*	1040-II -A-4
-IV	-A	*289*	290*	301*	*	*	*	*	*	*	*	*	*	*	1040-IV -A-3
-V	-A	*487*	*	*	*	*	*	*	*	*	*	*	*	*	1040-V -A-1
.F	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1040.F -A-0
1041-	-A	*156*	*	*	*	*	*	*	*	*	*	*	*	*	1041- -A-1
	-B	*156*	247*	*	*	*	*	*	*	*	*	*	*	*	1041- -B-2
-III	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1041-III -A-0
	-B	*247*	*	*	*	*	*	*	*	*	*	*	*	*	1041-III -B-1
1042-	-A	*157*	248*	303*	*	*	*	*	*	*	*	*	*	*	1042- -A-3
	-B	*157*	246*	248*	303*	*	*	*	*	*	*	*	*	*	1042- -B-4
-II	-A	*248*	303*	*	*	*	*	*	*	*	*	*	*	*	1042-II -A-2
	-B	*246*	248*	303*	*	*	*	*	*	*	*	*	*	*	1042-II -B-3
-III	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1042-III -A-0
	-B	*248*	*	*	*	*	*	*	*	*	*	*	*	*	1042-III -B-1
1043-	-A	*078*	097*	447*	*	*	*	*	*	*	*	*	*	*	1043- -A-3
-II	-A	*096*	097*	447*	*	*	*	*	*	*	*	*	*	*	1043-II -A-3
-III	-A	*447*	*	*	*	*	*	*	*	*	*	*	*	*	1043-III -A-1
-IV	-A	*447*	*	*	*	*	*	*	*	*	*	*	*	*	1043-IV -A-1
.D	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1043.D -A-0
.F	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1043.F -A-0
1045-	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1045- -A-0
-II	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1045-II -A-0
1046-	-A	*079*	080*	127*	135*	158*	326*	408*	*	*	*	*	*	*	1046- -A-7
	-B	*079*	080*	127*	135*	158*	244*	326*	408*	*	*	*	*	*	1046- -B-6
	-C	*079*	080*	127*	135*	158*	249*	326*	408*	*	*	*	*	*	1046- -C-6
-II	-A	*326*	406*	*	*	*	*	*	*	*	*	*	*	*	1046-II -A-2
	-B	*244*	326*	406*	*	*	*	*	*	*	*	*	*	*	1046-II -B-3
	-C	*249*	326*	408*	*	*	*	*	*	*	*	*	*	*	1046-II -C-3
-III	-A	*256*	326*	408*	*	*	*	*	*	*	*	*	*	*	1046-III -A-3
	-B	*244*	256*	326*	408*	*	*	*	*	*	*	*	*	*	1046-III -B-4
	-C	*249*	256*	326*	406*	*	*	*	*	*	*	*	*	*	1046-III -C-4
-IV	-A	*326*	406*	*	*	*	*	*	*	*	*	*	*	*	1046-IV -A-2
	-B	*244*	326*	408*	*	*	*	*	*	*	*	*	*	*	1046-IV -B-3
	-C	*249*	326*	408*	*	*	*	*	*	*	*	*	*	*	1046-IV -C-3
-V	-A	*408*	*	*	*	*	*	*	*	*	*	*	*	*	1046-V -A-1
.F	-A	*021*	035*	*	*	*	*	*	*	*	*	*	*	*	1046.F -A-2
1047-	-A	*111*	*	*	*	*	*	*	*	*	*	*	*	*	1047- -A-1
	-B	*111*	594*	632*	*	*	*	*	*	*	*	*	*	*	1047- -B-3
-III	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1047-III -A-0
	-B	*594*	632*	*	*	*	*	*	*	*	*	*	*	*	1047-III -B-2
1048-	-A	*123*	228*	229*	230*	493*	*	*	*	*	*	*	*	*	1048- -A-3
-II	-A	*493*	*	*	*	*	*	*	*	*	*	*	*	*	1048-II -A-1
-III	-A	*493*	*	*	*	*	*	*	*	*	*	*	*	*	1048-III -A-1

NORD-10 ECO CROSS REFRENCE
DATE: 850130

PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
-IV	-A	*493*	*	*	*	*	*	*	*	*	*	*	*	*	1048-IV -A-1
.F	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1048.F -A-0
1049-	-A	*227*231*507*	*	*	*	*	*	*	*	*	*	*	*	*	1049- -A-3
-II	-A	*507*	*	*	*	*	*	*	*	*	*	*	*	*	1049-II -A-1
.C	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1049.C -A-0
1050-	-A	*134*296*630*	*	*	*	*	*	*	*	*	*	*	*	*	1050- -A-3
1051-	-A	*137*	*	*	*	*	*	*	*	*	*	*	*	*	1051- -A-1
-II	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1051-II -A-0
1052-	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1052- -A-0
1053-	-A	*136*	*	*	*	*	*	*	*	*	*	*	*	*	1053- -A-1
-II	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1053-II -A-0
1054-II	-A	*147*164*165*221*222*233*	*	*	*	*	*	*	*	*	*	*	*	*	1054-II -A-6
-IV	-A	*164*209*221*222*233*	*	*	*	*	*	*	*	*	*	*	*	*	1054-IV -A-5
-VI	-A	*253*	*	*	*	*	*	*	*	*	*	*	*	*	1054-VI -A-1
-V	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1054-V -A-0
1055-	-A	*167*184*185*219*240*	*	*	*	*	*	*	*	*	*	*	*	*	1055- -A-5
-II	-A	*219*240*	*	*	*	*	*	*	*	*	*	*	*	*	1055-II -A-2
-III	-A	*219*240*242*	*	*	*	*	*	*	*	*	*	*	*	*	1055-III -A-3
-IV	-A	*240*	*	*	*	*	*	*	*	*	*	*	*	*	1055-IV -A-1
-V	-A	*240*	*	*	*	*	*	*	*	*	*	*	*	*	1055-V -A-1
-VI	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1055-VI -A-0
1056-	-A	*211*347*414*	*	*	*	*	*	*	*	*	*	*	*	*	1056- -A-3
	-B	*211*346*347*414*	*	*	*	*	*	*	*	*	*	*	*	*	1056- -B-4
-II	-A	*347*414*	*	*	*	*	*	*	*	*	*	*	*	*	1056-II -A-2
	-B	*346*347*414*	*	*	*	*	*	*	*	*	*	*	*	*	1056-II -B-3
1057-	-A	*206*	*	*	*	*	*	*	*	*	*	*	*	*	1057- -A-1
-III	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1057-III -A-0
1058-	-A	*169*424*466*	*	*	*	*	*	*	*	*	*	*	*	*	1058- -A-3
-II	-A	*169*424*466*	*	*	*	*	*	*	*	*	*	*	*	*	1058-II -A-3
-III	-A	*424*466*	*	*	*	*	*	*	*	*	*	*	*	*	1058-III -A-2
1060-II	-A	*167*205*206*239*259*262*308*345*383*	*	*	*	*	*	*	*	*	*	*	*	*	1060-II -A-9
-III	-A	*205*206*239*259*308*345*383*	*	*	*	*	*	*	*	*	*	*	*	*	1060-III -A-7
-IV	-A	*205*206*239*256*259*262*308*345*383*	*	*	*	*	*	*	*	*	*	*	*	*	1060-IV -A-9
-V	-A	*259*262*308*383*	*	*	*	*	*	*	*	*	*	*	*	*	1060-V -A-4
-VI	-A	*383*	*	*	*	*	*	*	*	*	*	*	*	*	1060-VI -A-1
-VII	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1060-VII -A-0
1061-	-A	*176*190*	*	*	*	*	*	*	*	*	*	*	*	*	1061- -A-2
-III	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1061-III -A-0
1062-	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1062- -A-0
1063-	-A	*191*192*230*	*	*	*	*	*	*	*	*	*	*	*	*	1063- -A-3
-III	-A	*204*230*	*	*	*	*	*	*	*	*	*	*	*	*	1063-III -A-2
-V	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1063-V -A-0
1064-	-A	*177*194*	*	*	*	*	*	*	*	*	*	*	*	*	1064- -A-2
-II	-A	*194*203*	*	*	*	*	*	*	*	*	*	*	*	*	1064-II -A-2
-IV	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1064-IV -A-0
1065-	-A	*193*	*	*	*	*	*	*	*	*	*	*	*	*	1065- -A-1
1066-	-A	*203*204*203*206*305*307*	*	*	*	*	*	*	*	*	*	*	*	*	1066- -A-6
-II	-A	*203*204*203*206*305*307*	*	*	*	*	*	*	*	*	*	*	*	*	1066-II -A-6
-III	-A	*203*206*305*307*	*	*	*	*	*	*	*	*	*	*	*	*	1066-III -A-4
-IV	-A	*305*307*	*	*	*	*	*	*	*	*	*	*	*	*	1066-IV -A-2
1067-	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1067- -A-0
-II	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1067-II -A-0
1068-	-A	*250*251*	*	*	*	*	*	*	*	*	*	*	*	*	1068- -A-2
1070.	-A	*324*406*	*	*	*	*	*	*	*	*	*	*	*	*	1070. -A-2
.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1070.B -A-0
1071.	-A	*489*	*	*	*	*	*	*	*	*	*	*	*	*	1071. -A-1
.B	-A	*489*	*	*	*	*	*	*	*	*	*	*	*	*	1071.B -A-1

PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
.C	-A	*489*	*	*	*	*	*	*	*	*	*	*	*	*	1071.C -A-1
.D	-A	*489*	*	*	*	*	*	*	*	*	*	*	*	*	1071.D -A-1
.E	-A	*489*	*	*	*	*	*	*	*	*	*	*	*	*	1071.E -A-1
.F	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1071.F -A-0
1072-	-A	*295*	*	*	*	*	*	*	*	*	*	*	*	*	1072- -A-1
-II	-A	*295*	*	*	*	*	*	*	*	*	*	*	*	*	1072-II -A-1
-III	-A	*295*	*	*	*	*	*	*	*	*	*	*	*	*	1072-III -A-1
-IV	-A	*333*	*	*	*	*	*	*	*	*	*	*	*	*	1072-IV -A-1
-V	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1072-V -A-0
1073-	-A	*407*	*	*	*	*	*	*	*	*	*	*	*	*	1073- -A-1
-II	-A	*407*	*	*	*	*	*	*	*	*	*	*	*	*	1073-II -A-1
-III	-A	*407*	*	*	*	*	*	*	*	*	*	*	*	*	1073-III -A-1
.D	-A	*488*490*	*	*	*	*	*	*	*	*	*	*	*	*	1073.D -A-2
.E	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1073.E -A-0
1074-III	-A	*401*438*	*	*	*	*	*	*	*	*	*	*	*	*	1074-III -A-2
.D	-A	*438*	*	*	*	*	*	*	*	*	*	*	*	*	1074.D -A-1
.E	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1074.E -A-0
1075-	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1075- -A-0
-II	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1075-II -A-0
1076-III	-A	*303*	*	*	*	*	*	*	*	*	*	*	*	*	1076-III -A-1
-IV	-A	*303*	*	*	*	*	*	*	*	*	*	*	*	*	1076-IV -A-1
-V	-A	*303*	*	*	*	*	*	*	*	*	*	*	*	*	1076-V -A-1
-VI	-A	*303*	*	*	*	*	*	*	*	*	*	*	*	*	1076-VI -A-1
-VII	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1076-VII -A-0
1077-	-A	*299*650*	*	*	*	*	*	*	*	*	*	*	*	*	1077- -A-2
-II	-A	*355*650*	*	*	*	*	*	*	*	*	*	*	*	*	1077-II -A-2
-III	-A	*299*302*304*355*650*	*	*	*	*	*	*	*	*	*	*	*	*	1077-III -A-3
-IV	-A	*299*302*304*355*650*	*	*	*	*	*	*	*	*	*	*	*	*	1077-IV -A-3
-V	-A	*355*650*	*	*	*	*	*	*	*	*	*	*	*	*	1077-V -A-2
1078-	-A	*334*529*	*	*	*	*	*	*	*	*	*	*	*	*	1078- -A-2
-II	-A	*334*348*356*529*	*	*	*	*	*	*	*	*	*	*	*	*	1078-II -A-4
-III	-A	*300*334*348*356*529*	*	*	*	*	*	*	*	*	*	*	*	*	1078-III -A-5
-IV	-A	*300*334*348*356*529*	*	*	*	*	*	*	*	*	*	*	*	*	1078-IV -A-5
-V	-A	*300*334*348*356*529*	*	*	*	*	*	*	*	*	*	*	*	*	1078-V -A-5
-VI	-A	*348*356*368*388*529*	*	*	*	*	*	*	*	*	*	*	*	*	1078-VI -A-5
-VII	-A	*356*368*388*429*529*	*	*	*	*	*	*	*	*	*	*	*	*	1078-VII -A-5
.H	-A	*527*529*	*	*	*	*	*	*	*	*	*	*	*	*	1078.H -A-2
.J	-A	*529*	*	*	*	*	*	*	*	*	*	*	*	*	1078.J -A-1
1079-II	-A	*357*	*	*	*	*	*	*	*	*	*	*	*	*	1079-II -A-1
-III	-A	*357*	*	*	*	*	*	*	*	*	*	*	*	*	1079-III -A-1
-IV	-A	*357*	*	*	*	*	*	*	*	*	*	*	*	*	1079-IV -A-1
-V	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1079-V -A-0
1080-III	-A	*395*	*	*	*	*	*	*	*	*	*	*	*	*	1080-III -A-1
-IV	-A	*395*	*	*	*	*	*	*	*	*	*	*	*	*	1080-IV -A-1
-V	-A	*395*	*	*	*	*	*	*	*	*	*	*	*	*	1080-V -A-1
.F	-A	*474*	*	*	*	*	*	*	*	*	*	*	*	*	1080.F -A-1
1081-	-A	*281*292*305*367*	*	*	*	*	*	*	*	*	*	*	*	*	1081- -A-3
-II	-A	*292*305*367*	*	*	*	*	*	*	*	*	*	*	*	*	1081-II -A-3
-III	-A	*367* *	*	*	*	*	*	*	*	*	*	*	*	*	1081-III -A-1
1083-	-A	*269*313*386*	*	*	*	*	*	*	*	*	*	*	*	*	1083- -A-3
	-B	*269*313*386*398*	*	*	*	*	*	*	*	*	*	*	*	*	1083- -B-3
-II	-A	*313*386*	*	*	*	*	*	*	*	*	*	*	*	*	1083-II -A-3
	-B	*313*386*398*	*	*	*	*	*	*	*	*	*	*	*	*	1083-II -B-3
-III	-A	*386*	*	*	*	*	*	*	*	*	*	*	*	*	1083-III -A-1
	-B	*386*398*	*	*	*	*	*	*	*	*	*	*	*	*	1083-III -B-1
.D	-A	*528*	*	*	*	*	*	*	*	*	*	*	*	*	1083.D -A-1
	-B	*398*528*	*	*	*	*	*	*	*	*	*	*	*	*	1083.D -B-1

PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
.E	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1083.E -A-0
	-B	*398*	*	*	*	*	*	*	*	*	*	*	*	*	1083.E -B-1
1085-	-A	*374*	*	*	*	*	*	*	*	*	*	*	*	*	1085- -A-1
	-B	*374*485*	*	*	*	*	*	*	*	*	*	*	*	*	1085- -B-2
-II	-A	*267*276*374*	*	*	*	*	*	*	*	*	*	*	*	*	1085-II -A-3
	-B	*267*276*374*485*	*	*	*	*	*	*	*	*	*	*	*	*	1085-II -B-4
-III	-A	*276*374*	*	*	*	*	*	*	*	*	*	*	*	*	1085-III -A-2
	-B	*278*374*485*	*	*	*	*	*	*	*	*	*	*	*	*	1085-III -B-3
-IV	-A	*374*	*	*	*	*	*	*	*	*	*	*	*	*	1085-IV -A-1
	-B	*374*485*	*	*	*	*	*	*	*	*	*	*	*	*	1085-IV -B-2
.E	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1085.E -A-0
	-B	*485*	*	*	*	*	*	*	*	*	*	*	*	*	1085.E -B-1
1087-	-A	*271*	*	*	*	*	*	*	*	*	*	*	*	*	1087- -A-1
-II	-A	*277*340*	*	*	*	*	*	*	*	*	*	*	*	*	1087-II -A-2
-III	-A	*340*	*	*	*	*	*	*	*	*	*	*	*	*	1087-III -A-1
-IV	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1087-IV -A-0
1089-	-A	*266*270*310*312*341*	*	*	*	*	*	*	*	*	*	*	*	*	1089- -A-5
	-B	*266*270*310*312*341*433*	*	*	*	*	*	*	*	*	*	*	*	*	1089- -B-6
-II	-A	*266*276*310*312*339*341*	*	*	*	*	*	*	*	*	*	*	*	*	1089-II -A-6
	-B	*268*276*310*312*339*341*433*	*	*	*	*	*	*	*	*	*	*	*	*	1089-II -B-7
-III	-A	*310*312*339*341*375*	*	*	*	*	*	*	*	*	*	*	*	*	1089-III -A-5
	-B	*310*312*339*341*375*433*	*	*	*	*	*	*	*	*	*	*	*	*	1089-III -B-6
-IV	-A	*339*341*375*	*	*	*	*	*	*	*	*	*	*	*	*	1089-IV -A-3
	-B	*339*341*375*433*	*	*	*	*	*	*	*	*	*	*	*	*	1089-IV -B-4
-V	-A	*375*	*	*	*	*	*	*	*	*	*	*	*	*	1089-V -A-1
	-B	*375*433*	*	*	*	*	*	*	*	*	*	*	*	*	1089-V -B-2
1090-	-A	*272*274*288*314*392*419*	*	*	*	*	*	*	*	*	*	*	*	*	1090- -A-6
-II	-A	*274*288*314*330*392*419*	*	*	*	*	*	*	*	*	*	*	*	*	1090-II -A-6
-III	-A	*288*314*392*419*	*	*	*	*	*	*	*	*	*	*	*	*	1090-III -A-4
-IV	-A	*314*392*419*	*	*	*	*	*	*	*	*	*	*	*	*	1090-IV -A-3
-V	-A	*314*384*392*419*	*	*	*	*	*	*	*	*	*	*	*	*	1090-V -A-4
.F	-A	*463*	*	*	*	*	*	*	*	*	*	*	*	*	1090.F -A-1
.G	-A	*517*	*	*	*	*	*	*	*	*	*	*	*	*	1090.G -A-1
.H	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1090.H -A-0
1092-III	-A	*301*306*362*365*	*	*	*	*	*	*	*	*	*	*	*	*	1092-III -A-4
-IV	-A	*301*306*362*365*	*	*	*	*	*	*	*	*	*	*	*	*	1092-IV -A-4
-V	-A	*301*306*362*365*	*	*	*	*	*	*	*	*	*	*	*	*	1092-V -A-4
-VI	-A	*309*	*	*	*	*	*	*	*	*	*	*	*	*	1092-VI -A-1
-VII	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1092-VII -A-0
1093.A	-A	*359*	*	*	*	*	*	*	*	*	*	*	*	*	1093.A -A-1
	-D	*359*	*	*	*	*	*	*	*	*	*	*	*	*	1093.A -D-2
.B	-A	*318*359*	*	*	*	*	*	*	*	*	*	*	*	*	1093.B -A-2
	-D	*318*359*	*	*	*	*	*	*	*	*	*	*	*	*	1093.B -D-3
.C	-A	*359*	*	*	*	*	*	*	*	*	*	*	*	*	1093.C -A-1
	-D	*359*	*	*	*	*	*	*	*	*	*	*	*	*	1093.C -D-2
.E	-B	*453*454*516*	*	*	*	*	*	*	*	*	*	*	*	*	1093.E -B-3
	-C	*453*454*513*516*	*	*	*	*	*	*	*	*	*	*	*	*	1093.E -C-4
	-D	*453*454*516*	*	*	*	*	*	*	*	*	*	*	*	*	1093.E -D-4
.F	-B	*516*	*	*	*	*	*	*	*	*	*	*	*	*	1093.F -B-1
	-C	*513*516*	*	*	*	*	*	*	*	*	*	*	*	*	1093.F -C-2
	-D	*516*	*	*	*	*	*	*	*	*	*	*	*	*	1093.F -D-2
.G	-B	*	*	*	*	*	*	*	*	*	*	*	*	*	1093.G -B-0
	-C	*513*	*	*	*	*	*	*	*	*	*	*	*	*	1093.G -C-1
	-D	*	*	*	*	*	*	*	*	*	*	*	*	*	1093.G -D-1
1094-II	-A	*315*320*325*330*459*481*500*	*	*	*	*	*	*	*	*	*	*	*	*	1094-II -A-7
	-B	*315*320*325*459*481*500*	*	*	*	*	*	*	*	*	*	*	*	*	1094-II -B-6
-III	-A	*273*275*307*315*320*325*330*459*481*500*	*	*	*	*	*	*	*	*	*	*	*	*	1094-III -A-10

PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
	-B	*273*275*307*315*320*325*459*481*500*									*	*	*	*	1094-III -B-9
-IV	-A	*275*307*315*320*325*336*459*481*500*									*	*	*	*	1094-IV -A-9
	-B	*275*307*315*320*325*459*481*500*									*	*	*	*	1094-IV -B-8
-V	-A	*336*459*481*500*			*	*	*	*	*	*	*	*	*	*	1094-V -A-4
	-B	*459*481*500*			*	*	*	*	*	*	*	*	*	*	1094-V -B-3
.F	-A	*336*481*500*			*	*	*	*	*	*	*	*	*	*	1094.F -A-3
	-B	*481*500*			*	*	*	*	*	*	*	*	*	*	1094.F -B-2
1095.A	-A	*279*291*328*364*409*431*456*618*									*	*	*	*	1095.A -A-8
	-B	*279*291*328*350*364*409*431*456*618*									*	*	*	*	1095.A -B-9
	-C	*279*291*328*364*409*31*455*456 *618*									*	*	*	*	1095.A -C-9
	-D	*279*291*328*409*431*456*618*									*	*	*	*	1095.A -D-7
	-E	*279*291*328*409*431*456*585*618*									*	*	*	*	1095.A -E-8
.B	-A	*279*291*328*364*409*431*456*618*									*	*	*	*	1095.B -A-8
	-B	*279*291*328*350*364*409*431*456*618*									*	*	*	*	1095.B -B-9
	-C	*279*291*328*364*409*431*455*456*618*									*	*	*	*	1095.B -C-9
	-D	*279*291*328*409*431*456*618*									*	*	*	*	1095.B -D-7
	-E	*279*291*328*409*431*456*585*618*									*	*	*	*	1095.B -E-8
.C	-A	*279*291*328*364*409*431*456*618*									*	*	*	*	1095.C -A-8
	-B	*279*291*328*350*364*409*431*456*618*									*	*	*	*	1095.C -B-9
	-C	*279*291*328*364*409*431*450*456*618*									*	*	*	*	1095.C -C-9
	-D	*279*291*328*409*431*456*618*									*	*	*	*	1095.C -D-7
	-E	*279*291*328*409*431*456*585*618*									*	*	*	*	1095.C -E-8
.D	-A	*279*328*364*409*431*456*618*									*	*	*	*	1095.D -A-7
	-B	*279*328*350*364*409*431*456*618*									*	*	*	*	1095.D -B-6
	-C	*279*328*364*409*431*455*456*618*									*	*	*	*	1095.D -C-8
	-D	*279*328*409*431*456*618*			*	*	*	*	*	*	*	*	*	*	1095.D -D-6
	-E	*279*328*409*431*456*585*618*									*	*	*	*	1095.D -E-7
.E	-A	*328*364*409*431*456*618*			*	*	*	*	*	*	*	*	*	*	1095.E -A-6
	-B	*328*350*364*409*431*456*618*									*	*	*	*	1095.E -B-7
	-C	*328*364*409*431*455*456*618*									*	*	*	*	1095.E -C-7
	-D	*328*409*431*456*618*			*	*	*	*	*	*	*	*	*	*	1095.E -D-5
	-E	*328*409*431*456*585*618*									*	*	*	*	1095.E -E-6
.F	-A	*409*431*456*618*			*	*	*	*	*	*	*	*	*	*	1095.F -A-4
	-B	*350*409*431*456*618*									*	*	*	*	1095.F -B-5
	-C	*409*431*455*456*618*									*	*	*	*	1095.F -C-5
	-D	*409*431*456*584*618*									*	*	*	*	1095.F -D-5
	-E	*409*431*456*585*618*									*	*	*	*	1095.F -E-6
.G	-A	*456*618*			*	*	*	*	*	*	*	*	*	*	1095.G -A-2
	-B	*350*456*618*			*	*	*	*	*	*	*	*	*	*	1095.G -B-3
	-C	*455*456*618*			*	*	*	*	*	*	*	*	*	*	1095.G -C-3
	-D	*456*584*618*			*	*	*	*	*	*	*	*	*	*	1095.G -D-3
	-E	*456*585*618*			*	*	*	*	*	*	*	*	*	*	1095.G -E-3
.H	-A	*593*618*			*	*	*	*	*	*	*	*	*	*	1095.H -A-2
	-B	*350*593*618*			*	*	*	*	*	*	*	*	*	*	1095.G -B-3
	-C	*455*593*618*			*	*	*	*	*	*	*	*	*	*	1095.H -C-3
	-D	*584*593*618*			*	*	*	*	*	*	*	*	*	*	1095.H -D-3
	-E	*585*593*618*			*	*	*	*	*	*	*	*	*	*	1095.H -E-3
1090.B	-A	*316*524*			*	*	*	*	*	*	*	*	*	*	1090.B -A-2
	-B	*316*524*			*	*	*	*	*	*	*	*	*	*	1090.B -B-2
.C	-A	*524*			*	*	*	*	*	*	*	*	*	*	1090.C -A-1
	-B	*524*			*	*	*	*	*	*	*	*	*	*	1090.C -B-1
.D	-A	*			*	*	*	*	*	*	*	*	*	*	1090.D -A-0
	-B	*			*	*	*	*	*	*	*	*	*	*	1090.D -B-0
1097-	-A	*243*267*410*			*	*	*	*	*	*	*	*	*	*	1097- -A-3
-II	-A	*243*267*410*			*	*	*	*	*	*	*	*	*	*	1097-II -A-3
-III	-A	*267*410*			*	*	*	*	*	*	*	*	*	*	1097-III -A-2
-IV	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1097-IV -A-0

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PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
1098-	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1098- -A-0
1099-	-A	*330*352*	*	*	*	*	*	*	*	*	*	*	*	*	1099- -A-2
1101.B	-A	*319*342*349*420*432*458*521*599*623*653*664*										*	*	*	1101.B -A-11
.C	-A	*342*349*420*432*458*521*599*623*653*664*										*	*	*	1101.C -A-10
.D	-A	*349*420*432*458*521*599*623*653*664*									*	*	*	*	1101.D -A-9
.E	-A	*420*432*458*521*599*623*653*664*								*	*	*	*	*	1101.E -A-8
.F	-A	*458*521*599*623*653*664*							*	*	*	*	*	*	1101.F -A-6
1102-	-A	*587*651*	*	*	*	*	*	*	*	*	*	*	*	*	1102- -A-2
1103-	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1103- -A-0
1104.A	-A	*337*	*	*	*	*	*	*	*	*	*	*	*	*	1104.A -A-1
.B	-A	*337*	*	*	*	*	*	*	*	*	*	*	*	*	1104.B -A-1
1105.	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1105. -A-0
.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1105.B -A-0
1107.	-A	*494*	*	*	*	*	*	*	*	*	*	*	*	*	1107. -A-1
.B	-A	*494*	*	*	*	*	*	*	*	*	*	*	*	*	1107.B -A-1
.C	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1107.C -A-0
1108.B	-A	*378*450*	*	*	*	*	*	*	*	*	*	*	*	*	1108.B -A-2
.C	-A	*378*450*	*	*	*	*	*	*	*	*	*	*	*	*	1108.C -A-2
.D	-A	*627*	*	*	*	*	*	*	*	*	*	*	*	*	1108.D -A-1
1106.B	-B	*378*450*666*	*	*	*	*	*	*	*	*	*	*	*	*	1106.B -B-3
.C	-B	*378*450*666*	*	*	*	*	*	*	*	*	*	*	*	*	1108.C -B-3
.D	-B	*627*666*	*	*	*	*	*	*	*	*	*	*	*	*	1108.D -B-2
1109.A	-A	*356*	*	*	*	*	*	*	*	*	*	*	*	*	1109.A -A-1
.B	-A	*356*	*	*	*	*	*	*	*	*	*	*	*	*	1109.B -A-1
.C	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1109.C -A-0
1111.B	-A	*372*394*397*544*													1111.B -A-4
.C	-A	*379*394*397*544*													1111.C -A-4
.D	-A	*544*	*	*	*	*	*	*	*	*	*	*	*	*	1111.D -A-1
.E	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1111.E -A-0
1112.	-A	*448*520*	*	*	*	*	*	*	*	*	*	*	*	*	1112. -A-2
	-B	*448*	*	*	*	*	*	*	*	*	*	*	*	*	1112. -B-1
.B	-A	*448*520*	*	*	*	*	*	*	*	*	*	*	*	*	1112.B -A-2
	-B	*448*	*	*	*	*	*	*	*	*	*	*	*	*	1112.B -B-1
.C	-A	*448*520*	*	*	*	*	*	*	*	*	*	*	*	*	1112.C -A-2
	-b	*	*	*	*	*	*	*	*	*	*	*	*	*	1112.C -B-0
.E	-A	*607*	*	*	*	*	*	*	*	*	*	*	*	*	1112.E -A-1
	-B	*607*	*	*	*	*	*	*	*	*	*	*	*	*	1112.E -B-1
1113.	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1113. -A-0
1114.C	-A	*442*452*	*	*	*	*	*	*	*	*	*	*	*	*	1114.C -A-2
.D	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1114.D -A-0
1115.D	-A	*444*445*557*	*	*	*	*	*	*	*	*	*	*	*	*	1115.D -A-3
.E	-A	*444*445*557*	*	*	*	*	*	*	*	*	*	*	*	*	1115.E -A-3
.F	-A	*557*	*	*	*	*	*	*	*	*	*	*	*	*	1115.F -A-1
1116.B	-A	*373*377*	*	*	*	*	*	*	*	*	*	*	*	*	1116.B -A-2
.C	-A	*377*	*	*	*	*	*	*	*	*	*	*	*	*	1116.C -A-1
.D	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1116.D -A-0
1119.B	-A	*440*	*	*	*	*	*	*	*	*	*	*	*	*	1119.B -A-1
.C	-A	*440*	*	*	*	*	*	*	*	*	*	*	*	*	1119.C -A-1
.D	-A	*440*	*	*	*	*	*	*	*	*	*	*	*	*	1119.D -A-1
.E	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1119.E -A-0
.F	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1119.F -A-0
1120.B	-A	*640*	*	*	*	*	*	*	*	*	*	*	*	*	1120.B -A-1
.C	-A	*640*	*	*	*	*	*	*	*	*	*	*	*	*	1120.C -A-1
1121.C	-A	*439*	*	*	*	*	*	*	*	*	*	*	*	*	1121.C -A-1
.D	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1121.D -A-0
1122.A	-A	*411*434*462*619*													1122.A -A-4
.B	-A	*411*434*462*619*													1122.B -A-4

PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
.C	-A	*462*619*	*	*	*	*	*	*	*	*	*	*	*	*	1122.C -A-2
.D	-A	*462*619*	*	*	*	*	*	*	*	*	*	*	*	*	1122.D -A-2
1123.B	-A	*425*428*	*	*	*	*	*	*	*	*	*	*	*	*	1123.B -A-2
.C	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1123.C -A-0
.D	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1123.D -A-0
1124.B	-A	*426*506*	*	*	*	*	*	*	*	*	*	*	*	*	1124.B -A-2
.C	-A	*473*506*	*	*	*	*	*	*	*	*	*	*	*	*	1124.C -A-2
.D	-A	*506* *	*	*	*	*	*	*	*	*	*	*	*	*	1124.D -A-1
.E	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1124.E -A-0
1125.B	-A	*415*441*	*	*	*	*	*	*	*	*	*	*	*	*	1125.B -A-2
.C	-A	*412*415*422*441*	*	*	*	*	*	*	*	*	*	*	*	*	1125.C -A-4
.D	-A	*441* *	*	*	*	*	*	*	*	*	*	*	*	*	1125.D -A-1
.E	-A	*441*	*	*	*	*	*	*	*	*	*	*	*	*	1125.E -A-1
1126.B	-A	*629*	*	*	*	*	*	*	*	*	*	*	*	*	1126.B -A-1
.C	-A	*404*421*629*	*	*	*	*	*	*	*	*	*	*	*	*	1126.C -A-3
.D	-A	*629*	*	*	*	*	*	*	*	*	*	*	*	*	1126.D -A-1
1127.B	-A	*416*423*443*457*460*624*654*	*	*	*	*	*	*	*	*	*	*	*	*	1127.B -A-7
.C	-A	*416*423*443*457*460*624*654*	*	*	*	*	*	*	*	*	*	*	*	*	1127.C -A-7
.D	-A	*443*457*460*486*624*654*	*	*	*	*	*	*	*	*	*	*	*	*	1127.D -A-6
.E	-A	*486*624*654*	*	*	*	*	*	*	*	*	*	*	*	*	1127.E -A-3
.F	-A	*486*624*654*	*	*	*	*	*	*	*	*	*	*	*	*	1127.F -A-3
.G	-A	*624*654*	*	*	*	*	*	*	*	*	*	*	*	*	1127.G -A-2
.H	-A	*624*654*	*	*	*	*	*	*	*	*	*	*	*	*	1127.H -A-2
1129.C	-A	*482*562*	*	*	*	*	*	*	*	*	*	*	*	*	1129.C -A-2
.D	-A	*562* *	*	*	*	*	*	*	*	*	*	*	*	*	1129.D -A-1
1130.C	-A	*451*546*551*576*	*	*	*	*	*	*	*	*	*	*	*	*	1130.C -A-4
.D	-A	*451*546*551*576*	*	*	*	*	*	*	*	*	*	*	*	*	1130.D -A-4
.E	-A	*576* *	*	*	*	*	*	*	*	*	*	*	*	*	1130.E -A-1
1132.D	-A	*498*	*	*	*	*	*	*	*	*	*	*	*	*	1132.D -A-1
1133.C	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1133.C -A-0
1134.E	-A	*536*	*	*	*	*	*	*	*	*	*	*	*	*	1134.E -A-1
.F	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1134.F -A-0
1135.C	-A	*519*549*563*641*	*	*	*	*	*	*	*	*	*	*	*	*	1135.C -A-4
.D	-A	*549*563*641*	*	*	*	*	*	*	*	*	*	*	*	*	1135.D -A-3
.E	-A	*563*641*	*	*	*	*	*	*	*	*	*	*	*	*	1135.E -A-2
1136.B	-A	*472*	*	*	*	*	*	*	*	*	*	*	*	*	1136.B -A-1
.C	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1136.C -A-0
1137.B	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1137.B -A-0
1138.B	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1138.B -A-0
1139.B	-A	*504*508*	*	*	*	*	*	*	*	*	*	*	*	*	1139.B -A-2
1140.B	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1140.B -A-0
1141.D	-A	*469*484*495*510*	*	*	*	*	*	*	*	*	*	*	*	*	1141.D -A-4
.F	-A	*510*561*	*	*	*	*	*	*	*	*	*	*	*	*	1141.F -A-2
.G	-A	*495*510*	*	*	*	*	*	*	*	*	*	*	*	*	1141.G -A-2
.H	-A	*510* *	*	*	*	*	*	*	*	*	*	*	*	*	1141.H -A-1
1142.C	-A	*466*476*499*525*625*634*	*	*	*	*	*	*	*	*	*	*	*	*	1142.C -A-6
.D	-A	*499*525*625*634*	*	*	*	*	*	*	*	*	*	*	*	*	1142.D -A-4
.E	-A	*500*625*634*	*	*	*	*	*	*	*	*	*	*	*	*	1142.E -A-3
1143.C	-A	*465*476*515*526*	*	*	*	*	*	*	*	*	*	*	*	*	1143.C -A-4
.D	-A	*476*515*526*	*	*	*	*	*	*	*	*	*	*	*	*	1143.D -A-3
.E	-A	*589*	*	*	*	*	*	*	*	*	*	*	*	*	1143.E -A-1
1144.C	-A	*477*496*505*574*579*610*	*	*	*	*	*	*	*	*	*	*	*	*	1144.C -A-6
.D	-A	*496*505*574*579*581*610*	*	*	*	*	*	*	*	*	*	*	*	*	1144.D -A-6
.F	-A	*556*579*610*	*	*	*	*	*	*	*	*	*	*	*	*	1144.F -A-3
1145.B	-A	*464*480*497*514*631*	*	*	*	*	*	*	*	*	*	*	*	*	1145.B -A-5
.C	-A	*480*497*631*	*	*	*	*	*	*	*	*	*	*	*	*	1145.C -A-3
1146.B	-A	*467*479*501*554*595*	*	*	*	*	*	*	*	*	*	*	*	*	1146.B -A-5

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PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION	
.C	-A	*479*	*501*	*554*	*595*	*	*	*	*	*	*	*	*	*	1146.C	-A-4
.D	-A	*554*	*595*	*604*	*	*	*	*	*	*	*	*	*	*	1146.D	-A-3
1147.C	-A	*540*	*564*	*	*	*	*	*	*	*	*	*	*	*	1147.C	-A-2
.D	-A	*540*	*564*	*	*	*	*	*	*	*	*	*	*	*	1147.D	-A-2
.E	-A	*564*	*592*	*	*	*	*	*	*	*	*	*	*	*	1147.E	-A-2
1148.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1148.B	-A-0
.C	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1148.C	-A-0
1151.B	-A	*483*	*511*	*578*	*	*	*	*	*	*	*	*	*	*	1151.B	-A-3
.C	-A	*511*	*578*	*	*	*	*	*	*	*	*	*	*	*	1151.C	-A-2
.D	-A	*511*	*578*	*	*	*	*	*	*	*	*	*	*	*	1151.D	-A-2
.E	-A	*578*	*609*	*	*	*	*	*	*	*	*	*	*	*	1151.E	-A-2
1152.B	-A	*602*	*620*	*	*	*	*	*	*	*	*	*	*	*	1152.B	-A-2
1153.D	-A	*558*	*596*	*661*	*	*	*	*	*	*	*	*	*	*	1153.D	-A-3
1154.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1154.B	-A-0
	-B	*605*	*	*	*	*	*	*	*	*	*	*	*	*	1154.B	-B-1
1155.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1155.B	-A-0
.C	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1155.C	-A-0
1156.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1156.B	-A-0
	-B	*611*	*	*	*	*	*	*	*	*	*	*	*	*	1156.B	-B-1
.C	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1156.C	-A-0
	-B	*611*	*	*	*	*	*	*	*	*	*	*	*	*	1156.C	-B-1
1157.	-A	*475*	*502*	*	*	*	*	*	*	*	*	*	*	*	1157.	-A-2
1158.C	-A	*509*	*	*	*	*	*	*	*	*	*	*	*	*	1158.C	-A-1
.D	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1158.D	-A-0
1159.	-A	*503*	*547*	*	*	*	*	*	*	*	*	*	*	*	1159.	-A-2
.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1159.B	-A-0
1160.C	-A	*530*	*	*	*	*	*	*	*	*	*	*	*	*	1160.C	-A-1
.D	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1160.D	-A-0
1161.C	-A	*531*	*539*	*559*	*566*	*597*	*	*	*	*	*	*	*	*	1161.C	-A-5
.D	-A	*539*	*559*	*566*	*597*	*	*	*	*	*	*	*	*	*	1161.D	-A-4
.E	-A	*559*	*597*	*601*	*648*	*	*	*	*	*	*	*	*	*	1161.E	-A-4
1162.C	-A	*569*	*614*	*	*	*	*	*	*	*	*	*	*	*	1162.C	-A-2
.D	-A	*569*	*614*	*	*	*	*	*	*	*	*	*	*	*	1162.D	-A-2
1163.D	-A	*533*	*538*	*550*	*	*	*	*	*	*	*	*	*	*	1163.D	-A-3
.E	-A	*538*	*550*	*	*	*	*	*	*	*	*	*	*	*	1163.E	-A-2
.F	-A	*550*	*	*	*	*	*	*	*	*	*	*	*	*	1163.F	-A-1
.G	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1163.G	-A-0
1164.C	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1164.C	-A-0
1165.B	-A	*532*	*537*	*560*	*615*	*	*	*	*	*	*	*	*	*	1165.B	-A-4
.C	-A	*560*	*600*	*615*	*	*	*	*	*	*	*	*	*	*	1165.C	-A-3
1166.C	-A	*638*	*	*	*	*	*	*	*	*	*	*	*	*	1166.C	-A-1
1167.D	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1167.D	-A-0
.D	-B	*	*	*	*	*	*	*	*	*	*	*	*	*	1167.D	-B-0
.D	-C	*535*	*	*	*	*	*	*	*	*	*	*	*	*	1167.D	-C-1
1168.	-A	*598*	*663*	*	*	*	*	*	*	*	*	*	*	*	1168.	-A-2
	-B	*598*	*628*	*663*	*	*	*	*	*	*	*	*	*	*	1168.	-B-3
1169.B	-A	*548*	*655*	*	*	*	*	*	*	*	*	*	*	*	1169.B	-A-2
	-B	*541*	*548*	*655*	*	*	*	*	*	*	*	*	*	*	1169.B	-B-3
.C	-A	*548*	*655*	*	*	*	*	*	*	*	*	*	*	*	1169.C	-A-2
	-B	*541*	*548*	*655*	*	*	*	*	*	*	*	*	*	*	1169.C	-B-3
.D	-A	*655*	*	*	*	*	*	*	*	*	*	*	*	*	1169.D	-A-1
	-B	*541*	*655*	*	*	*	*	*	*	*	*	*	*	*	1169.D	-B-2
1170.C	-A	*553*	*571*	*608*	*	*	*	*	*	*	*	*	*	*	1170.C	-A-3
	-B	*553*	*571*	*608*	*659*	*	*	*	*	*	*	*	*	*	1170.C	-B-4
1171.B	-A	*577*	*	*	*	*	*	*	*	*	*	*	*	*	1171.B	-A-1
1172.C	-A	*545*	*552*	*572*	*639*	*652*	*	*	*	*	*	*	*	*	1172.C	-A-5
	-B	*545*	*552*	*572*	*637*	*639*	*652*	*	*	*	*	*	*	*	1172.C	-B-6

PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
1172.E	-A	*552*572*639*652*			*	*	*	*	*	*	*	*	*	*	1172.E -A-4
	-B	*552*572*637*639*652*			*	*	*	*	*	*	*	*	*	*	1172.E -B-5
1173.B	-A	*656*	*	*	*	*	*	*	*	*	*	*	*	*	1173.B -A-1
	-B	*542*656*			*	*	*	*	*	*	*	*	*	*	1173.B -B-2
	-C	*646*656*			*	*	*	*	*	*	*	*	*	*	1173.B -C-2
1173.C	-A	*656*	*		*	*	*	*	*	*	*	*	*	*	1173.C -A-1
	-B	*542*656*			*	*	*	*	*	*	*	*	*	*	1173.C -B-2
	-C	*646*656*			*	*	*	*	*	*	*	*	*	*	1173.C -C-2
1174.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1174.B -A-0
1175.C	-A	*570*613*			*	*	*	*	*	*	*	*	*	*	1175.C -A-2
1176.C	-A	*622*657*			*	*	*	*	*	*	*	*	*	*	1176.C -A-2
1177.B	-A	*649*	*		*	*	*	*	*	*	*	*	*	*	1177.B -A-1
1181.B	-A	*566*633*			*	*	*	*	*	*	*	*	*	*	1181.B -A-2
1181.B	-B	*566*633*645*			*	*	*	*	*	*	*	*	*	*	1181.B -B-3
1182.A	-A	*658*662*			*	*	*	*	*	*	*	*	*	*	1182.A -A-2
1183.	-A	*567*580*612*647*			*	*	*	*	*	*	*	*	*	*	1183. -A-4
.B	-A	*567*580*612*647*			*	*	*	*	*	*	*	*	*	*	1183.B -A-4
1184.	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1184. -A-0
1185.	-A	*590*	*	*	*	*	*	*	*	*	*	*	*	*	1185. -A-1

*** THE ENGINEERING CHANGE ORDERS FOR 12XX CARDS ARE NAMED: ECO-NO. 12-XXX ***

1210.A	-A	*016*019*022*			*	*	*	*	*	*	*	*	*	*	1210.A -A-3
.B	-A	*016*019*022*			*	*	*	*	*	*	*	*	*	*	1210.B -A-3
.C	-A	*016*019*022*026*			*	*	*	*	*	*	*	*	*	*	1210.C -A-4
.D	-A	*019*022*026*			*	*	*	*	*	*	*	*	*	*	1210.D -A-3
.E	-A	*026*	*		*	*	*	*	*	*	*	*	*	*	1210.E -A-1
.F	-A	*029*	*		*	*	*	*	*	*	*	*	*	*	1210.F -A-1
.G	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1210.G -A-0
1211.B	-A	*024*031*			*	*	*	*	*	*	*	*	*	*	1211.B -A-2
.C	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1211.C -A-0
1213.B	-A	*025*027*			*	*	*	*	*	*	*	*	*	*	1213.B -A-2
.C	-A	*027*030*			*	*	*	*	*	*	*	*	*	*	1213.C -A-2
.D	-A	*030*	*		*	*	*	*	*	*	*	*	*	*	1213.D -A-1
.E	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1213.E -A-0

*** THE ENGINEERING CHANGE ORDERS FOR 19XX CARDS ARE NAMED: ECO-NO. 19-XXX ***

1905.-	-A	*636*	*	*	*	*	*	*	*	*	*	*	*	*	1905. -A-1
1946.C	-A	*660*667*			*	*	*	*	*	*	*	*	*	*	1946. -A-1

FUNCTION CODE DEFINITIONS

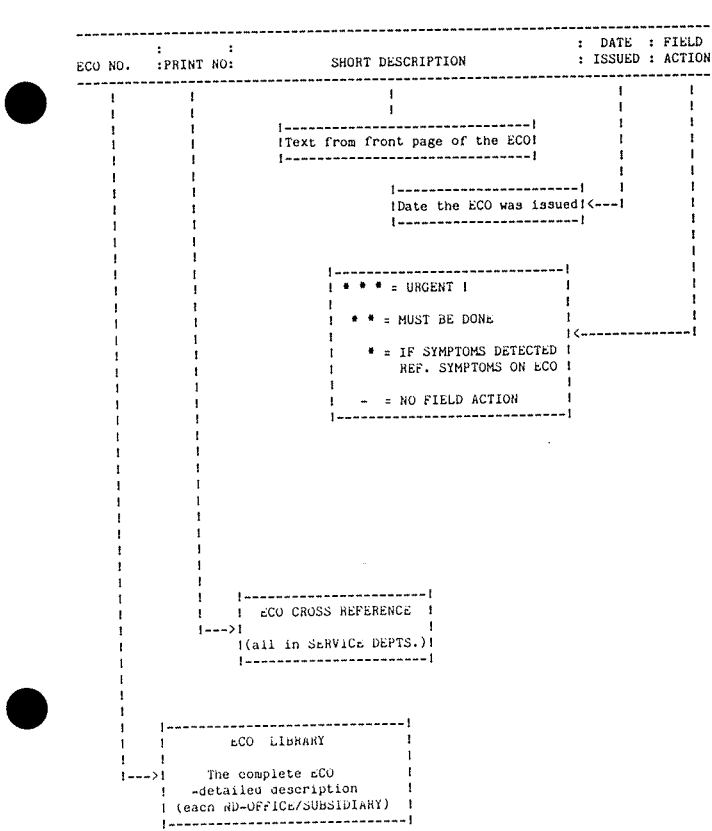
1005	B	USED WITH 64K CRATE	ECO 254
	C	USED WITH LONG CABLES	ECO 353
	D	COMBINATION OF B&C	ECO 254-353
1007	S	N-10/S ONLY	ECO 403
1011	B	CAMAC CONNECTED TO CPU RACK	
1012	B	IC 8B REMOVED (POS 4)	
1013	B	USED IN DRUM IF	ECO 381
1018	B	READ 5-6-7 CHNLS	ECO 280
	C	INHBT LIGTH CHECK 4-7	ECO 366
	D	FOR INTERFACING S-71-SA IN PDP-11 (INFOTEXT)	ECO 665
1019	B	IF THERE ARE 1056 CARD IN THE CRATE	
	C	EXTERNAL BLOCKING POSSIBILITY	ECO 491
1020	B	INPUT DATA USED AS BUSY	ECO 245
1021	B	USED WITH N-12	ECO 321
1022	B	USED IN CATSY IF	ECO 285
1023	B	N-12/N-42	ECO 360
	C	32-BITS FLOATING	ECO 380
	T	7404 CHANGED TO 74S04	ECO 449
1026	B	DP-2410	ECO 067
	C	LOGABOX	ECO 294
	D	CENTRONICS	ECO 084
1027	B	CAMAC CONNECTED TO CPU RACK	ECO 038
1033	T	USED IN NORD-10/S	ECO 402
1037	B	USED WITH HAWK DISK	ECO 322
1041	B	WITH 7050 TO IBM	ECO 247
1042	B	WITH 7051 TO IBM	ECO 246
1046	B	TEKTRONIX	ECO 244
	C	RS-232-C	ECO 249
1047	B	USED WITH DATA-PRINTER ND-433	ECO 594
1056	B	TRACKER BALL	ECO 346
1073	B	PROGRAMMED BUS SWITCH	ECO 335
	C	EXTERNAL BLOCKING POSSIBILITY	ECO 492
1083	B	CHANNEL INHIBIT	ECO 398
1085	B	LONG MPM CABLES	ECO 485
1089	B	INCREASE REFR. 32K	ECO 433
1093	A	PRINT A-D	
	B	PRINT E...	
	C	BAD BMB TIMING, PRINT E...	ECO 513
	D	USED IN BUS RECEIVER (POS. 2 AND 5)	
1094	A	INTEL MEMORY PACKAGE	ECO 330
	B	TEXAS MEMORY PACKAGE	WITHOUT ECO 330
1095	B	CONVERT ND 255 TO ND 010(CONSOL INTERFACE)	
	C	65,7 BAUD NTB	ECO 455
	D	BUSY USED	ECO 304 REMOVED
	E	BUSY ON CURRENT LOOP	ECO 565
1096	B	IMPROVEMENT	ECO 523
1099	B	USING 2 X 32K CRATES CORE MEM.	ECO 330
	C	LONG CABLES	ECO 352
	D	COMBINATION OF B&C	ECO 330-352

FUNCTION CODE DEFINITIONS

1106	B	FOR INTERFACING VIDEOSETTER PHOTOCOMP.	ECO 666
1112	A	CALCOMP 900	
	B	CALCOMP 500	
1154	B	PHOENIX DISK	ECO 605
1156	B	PHOENIX DISK	ECO 611
1167	B	32 BITS FLOATING	
	C	COMMERSIAL INST. SET	
1168	B	USED WITH 1170 BOARD	ECO 628
1169	B	STANDARD 20 MA CURRENT LOOP	ECO 541
1170	B	CONFIGURATIONS THAT REQUIRE MORE THAN ONE CARD (SWITCH FOR DEV.NO AND IDENT)	ECO 659
1172	B	CONFIGURATIONS WITH ND-850 IN NORD-10 I/O CROLE	ECO 637
1173	B	SPECIAL USE	ECO 542
1173	C	SPECIAL USE	ECO 646
1181	B	COMPUTER LINK TERMINATION	ECO 645
1211	B	LONG MPM CABLES	ECO 485

FUNCTION CODE S: BOARD WILL ONLY WORK ON N10/S
FUNCTION CODE T: CHANGE DETECTED ON N10/S, BUT BOARD WILL ALSO WORK ON STANDARD N10

EXPLANATION



ECO NO.	PRINT NO:	SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
10-473	1124	Print error.	780126	
10-474	1080	Print error.	780126	
10-475	1157	Add pullup-resistor to ease testing in card-tester.	780126	
10-476	1143	Error on arrangement drawing.	780126	
10-477	1144	Print error.	780126	
10-478	1142	Print error.	780126	
10-479	1146	Error on arrangement drawing.	780126	
10-480	1145	Add pullup-resistors to ease testing in card-tester.	780126	
10-481	1094	To get the "CE" within margin specs'.	780202	
10-482	1129	Print error.	780202	
10-483	1151	Design changes.	780202	
10-484	1141	Design changes.	780202	
10-485	1085 1211	Reflections in long multiport memory cables due to bad or missing termination may give double AR or DR pulses.	780202	
10-486	1127	Print error.	780224	
10-487	1040	Print error.	780224	
10-488	1073	Print error.	780224	
10-489	1071	Noise on N-10 / N-50 Data Bus	780303	
10-490	1073	Print error.	780307	
10-491	1019	External blocking of I/O-bus to CAMAC and OEM equipment.	780322	
10-492	1073	External blocking of I/O-bus to CAMAC and OEM equipment.	780322	
10-493	1048	MT Formatter hang-up after Power-fail	780322	
10-494	1107	No connection through print gives bad connection to pin on formatting switch.	780322	
10-495	1141	To give greater flexibility in selection of data rates in direct communication using HDLC interfaces.	780406	
10-496	1144	Print errors. Too hard termination on BDR etc.	780413	
10-497	1145	Arrangement error.	780413	
10-498	1132	Decrease current drain on -12V. Use electrolytic capacitors with better voltage rating at +12V.	780413	
10-499	1142	Change colour of LED's from red to yellow on signals which do not indicate error.	780413	
10-500	1094	To reduce ripple on -5V.	780413	
10-501	1146	Increase TIMO with 50%. Improve handling of testinterrupt.	780413	
10-502	1157	Arrangement error.	780413	
10-503	1159	Decrease current drain on -12V. Use electrolytic capacitors with better voltage rating at +12V.	780413	
10-504	1139	All possible kinds of errors.	780420	
10-505	1144	1. More termination on BAR and BDR. 2. Delay end of DATLOCK. 3. False TIMOUT caused Memory out of range.	780420	
10-506	1124	Overflow (SB12) when reading a record with recordlength=wordcount in odd-byte modus.	780419	
10-507	1049	Overflow (SB12) when reading a record with recordlength=wordcount in odd-byte modus.	780518	
10-508	1139	Print error.	780518	

ECO NO.	PRINT NO:	SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
10-509	1156	1156 DR11-C corrected to satisfy ND standard programming specification for clearing of RTF-flip-flop, and one print error corrected.	780522	
10-510	1141	Practive dangerous to security. Possible unstabile flip-flop output. Noise reduction.	780525	
10-511	1151	Marginal timing. Noise reduction.	780525	
10-512	6017	Print error. Terminating resistors lack +5V connection.	780522	
10-513	1093	Marginal Timing on Bus Memory Brancher.	780522	
10-514	1145	Print made in CSB-Italy is not equal with print made in ME-USA.	780525	
10-515	1143	Data Ready pulse too short.	780615	
10-516 B	1093	Print error.	780615	
10-517	1090	Print error.	780615	
10-518	BW	Write protect is not used on Falcon Disk, it is just pinned through for compatibility with hawk disc. For disabling when power fail, "terminator monitor" has to be used.	780619	
10-519	1135	Superdisk controller, in test mode, generates an unpredictable data pattern. This change will make the pattern stable.	780619	
10-520	1112	"Ready" from Calcomp 900-series gives problems on 1112/900-card. 1112/900A,B,C.	780619	
10-521	1101	Too short address set-up time on MPX ADDR.	780626	
10-522	BW	DMA address extension.	780626	
10-523	1090	Improvement of worst case timing on MPX ADR set up.	780626	
10-524	1090	To cross 64K boundaries with 1153 installed.	780626	
10-525	1142	1. Fail Safe doesn't work properly. 2. Noise on trailing edge of IREQ-0.	780626	
10-526	1143	1. Possible incorrect state of REN-FF at power up. 2. Noise on P1-0.	780626	
10-527	1076	Print errors.	780706	
10-528	1083	Print errors.	780706	
10-529	1076	Wrong frequency on test-oscillator.	780725	
10-530	1160	Too big peak current at power on. Print error.	780727	
10-531	1161	Design error.	780727	
10-532	1165	Too short Data Ready.	780727	
10-533	1163	Short between +5V and GND. Misplaced decoupling capacitor.	780727	
10-534	1023	1. Inclusion of microprogrammed memory test in 32-bit floating point microprogram. 2. Improvement of accurancy in least significant bit for floating point divide (32-bits.). 3. Inclusion of mass storage load extended address range.	780807	
10-535	1167	Incorrect microprogram (COMMIC 1) for 'Commercial Instruction Set'.	780807	
10-536	1134	1. "Master Clear-Load" does not function correctly on super disk controller because the second block address register is not reset by Master Clear. 2. Print error.	780807	

ECO NO.	PRINT NO:	SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
10-537	1165	Design error.	780808	
10-538	1103	Neccessary delay to run N50 with static memory.	780816	
10-539	1161	Possible MOM on 32 bits MUX.	780927	
10-540	1147	Too short drop of DATA TERMINAL READY after timeout.	780901	
10-541	1169	116y used as a standard 20 mA terminal interface or connected to local telex lines (teleprinter).	780901	
10-542	1173	Special connections to card 1173.	780901	
10-544	1111	Marginal timing in LOAD sequence in card 1111 Floppy Disc Control	780906	
10-545	1172	Function errors.	781004	
10-546	1130	Print error.	781023	
10-547	1159	Print error. Arrangement error. Logic diagram errors.	781101	
10-548	1169	Print error.	781108	
10-549	1135	Marginal timing on read data versus read clocks. Add pull up on unused input.	781117	
10-550	1163	Debug facility on large memory systems.	781117	
10-551	1130	No access to VFU. LP6 has to be connected to LP9. Print error.	781117	
10-552	1172	Functional error.	781201	
10-553	1170	Incorrect connect of +5V to resistor network.	781205	
10-554	1140	Error in interrupt handling.	781205	
10-556	1144	Marginal timing on DATLOCK.	790118	
10-557	1115	One-shot 10C is trigged by noise on some cards.	790112	
10-558	1153	Incorrect operation when using external CORE ADDRESS REGISTER.	790104	
10-559	1161	Memory ou of range on 32 bits MUX when running two N-50s.	781220	
10-560 C	1165	Power-up should set MEN-flipflop correctly: Must be done together with ECO:10-591	800425	* *
10-561	1141	Print error.	781221	
10-562	1129	Marginal timing for write format on 10Mbyte disk interface.	790123	
10-564	1147	Make card testable on card tester.	790215	
10-566	1181	Problems when connected to modem.	790227	
10-567	1103	Print error.	790227	
10-568	1161	Possible MOR on 32 bits Mux.	790301	
10-569	1102	Print error.	790316	
10-570	1175	Print error, missing connections. Possible MOR. Too short timeout.	790317	
10-571	1170	Incorrect connect of +5V to resistor network.	790524	
10-572	1172	DMA ACTIVE-0 goes high before COMPLETE-0 goes high	790131	
10-574	1144	Design improvement.	790321	
10-575	0021	Print error.	790306	
10-576 B	1130	The printer must have a "print" character to empty the buffer.	790329	
10-577	1171	Print error.	790420	
10-578	1151	Noise on ground.	790405	

ECO NO.		PRINT NO:	SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
10-579		1144	Marginal timing, bad shapes on signals.	790509	
10-580		1103	Necessary delay to run N50 with stat. mem.	790807	
10-581		1144	Wrong implementing of ECO-477.	790914	
10-582	B	1020	To avoid interrupt enable flip-flop cleared.	830503	*
10-583	B	1135	Initiate clear to the ECC op flip-flop X5.	810427	
10-584		1095	Only valid when BUSY on term. 80 is used. The card must be marked with function code D.	790905	
10-585	B	1095	Convert from ND-253 to ND-258.	790905	
10-586		1027	Necessary modification due to Camac.	790905	
10-587	B	1102	Wrong data to Versatec plotter.	800321	
10-588	B	1142	Grounding of address bit 20 and 21. In connection with interleave.	810612	*
10-589		1143	Print error detected by card test.	790921	
10-590		1105	Short power / ground.	790822	
10-591		6021	Memory hang-up after Power up. Must be done together with ECO:10-560	790824	* *
10-592		1147	No connection to 19C12. 17B13 connected for an unused output.	790905	
10-593		1095	Print error. Missing connection on signal BA0-6.	790905	
10-594	D	1047	This ECO makes it possible to use 12 VFU cn.on D.Print.	810326	*
10-595		1146	To mix 26LS31 with MC/DC 3487 and 26LS32 with MC/DS3486.	790910	
10-596		1153	To mix 26LS31 with MC/DC 3487.	790910	
10-597		1101	To mix 26LS31 with MC/DC 3487.	790910	
10-598		1100	To mix 26LS31 with MC/DS 3486.	790906	
10-599		1101	Parity error.	790926	*
10-600		1105	N-50 Test System failing (MEMORY TESTS) Demands ECO:10-601 done.	791024	* *
10-601		1101	N-50 Test System failing (MEMORY TESTS) Demands ECO:10-600 done.	791024	* *
10-602		1152	Remote load frame not detected.	791020	
10-604		1146		791002	
10-605		1154	Necessary change for PHOENIX disc.	791108	*
10-606		BW	If alternativ pagetable is used (status bit 0).	791122	*
10-607		1112	Does not work. Print error.	800115	
10-608		1170	One chip to much. Short between +5V and GND.	791126	
10-609		1151	Unused inputs on 74LS51 may cause failure. No indication so far.	800115	
10-610		1144	Several testprograms fails with many memory modules in one bank.	800129	* * *
10-611		1150	The Phoenix disc has 18 equal sectors, plus a short 19th sector, which gives errors in testprograms.	800124	* *
10-612		1103	Necessary delay to run N-50 with static memory.	800220	* *
10-613		1175	Memory out of range on N-50 through multiplexer.	800220	* *
10-614	B	1162	Memory out of range on N-50. Too short address ready s.	800312	* *
10-615		1105	Memory out of range on N-50. Too short address ready s.	800220	* *

ECO NO.	PRINT NO:	SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
10-616	1016	Marginal timing on SPROCKET if the tape has "Leading Sprocket".	800318	*
10-617	1020	Increase the current in both input and output loops.	800318	*
10-618	1095	Increase the current in both input and output loops.	800318	*
10-619 B	1122	Increase the current in both input and output loops.	821112	*
10-620	1152	Remote Load does not work.	800617	*
10-621	1046	Print errors. Missing connections to capacitors. May cause illegal interrupts.	800606	
10-622	1170	No connection of INIDENT-OUTIDENT and INGRANT-OUTGRANT.	800606	
10-623	1101	Gives M.O.H. on systems with memory multiplexers. Extend timeout on DMA.	810216	
10-624	1127	Gives IOX-error on systems with memory multiplexers.	810216	
10-625	1142	Rubbish data received due to desabling of databus. Symptom is that REQ lamp on 1142 is turned off after successfull access. FATAL for channels using more than one port in parallell (= 32 bits) (i.e. N-50, N-500).	801119	* *
10-626	ND 5227 550	Missing INHIBITo signal to 33-66Mb and ECC-disk controller during Power Fail.	810302	*
10-627	322001	Missing fuseholder & fuse, and mounting clip for rectifier.	801206	
10-628	1166	Gives continous interrupts when connected to 1170 (EXTERNAL INTERRUPT). Has to be done only when connected to 1170 board. The card must be marked w/function code B.	810317	
10-629	1126	Cache-test fails on marginal high voltage.	810129	*
10-630	1050	IOX error in level 12, and/or false interrupt when running SINTRAN.	810204	*
10-631	1145	To prevent memory hangup after powerfail. Necessary when memory are located in different cabinets.	810310	*
10-632	1047	Makes it possible to use 96 characters option on ND433 Lineprinter. This ECO shall only be done on card with function code B (i.e. ECO 10-594 has been done).	810516	
10-633	1161	Glitches may generate spikes on INPUT.	810523	
10-634	1142	Modification for use of big memory for ND-100/ND-500 combinations - max. size 4Mb. New UPPER LIMIT : 80.	810507	*
10-635	1046	Missing connection between 11E7 and GND.	810915	
10-636	1905 (ND 252)	Retransmission in NORD-NET using current loop intercomputer link. Especially notable in NORD-10 - ND-100 communication.	810926	
10-637 B	1172	IOX ERROR/FALSE INTERRUPT LEVEL (DEC): 11. Only in configurations with ND-850 in ND-10 I/O crate connected to ND-100 via Euroline Adapter. NB: The card must be marked with function code B.	811007	
10-638	1166	Occasionally the Clock Counter contents is destroyed.	810911	*

ECO NO.	PRINT NO:	SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
10-639	1172	Marginal resetting of DMA-request could cause one extra faulty DMA transfer per COMPLETE/REQUEST handshake cycle. Symptoms will be unexpected number of transfers/corrupted data.	811014	*
10-640	1120	Floating Point Divide(48-bit floating pt.) fails sporadically, depending on swapping activity. Caused by last word of operand in location 0 of page.	811221	*
10-641 B	1135	Disc content may be destroied during ECC operation.	820625	* * *
10-642	1025	Floating Point Divide(48-bit floating pt.) fails sporadically depending on swapping activity. Caused by last word of operand in location 0 of page	820121	*
10-643	1025	Floating Point Divide(48-bit floating pt.) fails sporadically depending on swapping activity. Caused by last word of operand in location 0 of page.	820120	*
10-644	1025	Floating Point Divide(48-bit floating pt.) fails sporadically depending on swapping activity. Caused by last word of operand in location 0 of page.	820120	*
10-645 B	1161	When using long cable and computer link termination may be necessary. After modification the card should be marked with function code B which means only for computer link(not for modem).	821216	*
10-646	1173	a)Detection of busy standby telex line. b)Changes for programmable switching from telex standby to computer(if Televerket, the norwegian PTT, agress). NOTE:The card must be marked with function code C.	820127	
10-647	1163	Necessary delay to run NORD-50 with static memory.	820204	* *
10-648 B	1161	Improvement of address set-up time to "Shared Memory". Print error.	820309	* *
10-649	1177	Print and drawing error. Missing Resistor net.	820211	
10-650	1077	Timeout too short for a Return to Zero seek on SMD (gives status bit 6)	820224	*
10-651	1102	Noise on NOPAP-1 and ONLIN-0 signals between Versatec and interface.	820610	*
10-652	1172	Application program dependent error message after ND-850 hangup / non corresponding core Address Register and word connt.	820610	* *
10-653	1161	Gives MOR on systems with memory multiplexers. Extend timeout on DMA.	820921	*
10-654	1127	Gives IOX-error on systems with memory multiplexers.	820921	*
10-655	1169	Print error (missing pullups).	820715	
10-656	1173	Too short time when switching from CPU to stanby telex.	821125	*

ECO NO.	PRINT NO:	SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
10-057	1176	Input hang-up from highspeed NCT controller.	830210	* *
10-058	1182	Data transfer error due to error in arrangement drawing.	830808	
10-059 C	1170	Some configurations as SINGER require more than one EXT. INT. 1170 card. The card has no switchselection for dev.no. and ident. After modification the card should be marked with function code B.	840126	
10-060	1948	Noise on 5V and GND on memory chips and register chips containing colour information.	831027	*
10-061	1153	Fatal if used against MPM-4 port with ECO:100-368(ECO level P or higher). Cable according to attached cable list must be installed.(Part No.:322844).	840125	*
10-062	1182	GPIB remote box does not work.	840125	
10-063	1166	Noise on output control lines from 1172 will produce glitches on differential signals.	840222	* *
10-064	1101	Noise on MIOXE, MDRY and MMCL due to lack of termination. May cause errors like "Core address register error" or wrong data to Versatec print/plot.	840614	*
10-065	1016	Modification for using Tape Reader Interface for interfacing S-71-SA in PDP-11 (INFOTEXT). NOTE! The card must be marked with function code D.	840614	
10-066 B	1100	Modification for using 1100, Remote Byte for interfacing Videosetter Photocomposer. NOTE!The card must be marked with function code B.	841011	
10-067	1948	"Hangup" in CTC terminal when running in current loop or RS232 due to low noise margin on HIGH SPEED input signal. May turn the HSPD 1 signal on.	850100	*

ND TECH. TIP No.:03. Issued by LB. July 26. 1982
NORD-10/S

Big MPM Data 1143

Background:

With some Big MPM data cards it is sometimes impossible to run the memory test program Multi or SINTRAN correctly without first running test program T32K-MOS or MPM Maintenance. For that reason several Big MPM Data cards are returned to the service workshop as defective, but no faults are found.
Solution:

This problem occures only when the card is put in the crate with power on. Neither MULTI nor SINTRAN clear the ECCR register. Bit 0 or 1 in this register is used for test purpose only to test if error correction is working properly. Master Clear is not connected to this crate, so the only way to clear this register is either by software or powerfail. If these bits in the ECCR register is set, they will force an error correction without any parityerrors and are therefore fatal for both MULTI and the system. If bit 3 in ECCR is set, error correction is not working at all.
Conclusion:

The easiest way to solve this problem will be in software. It will probably be implemented on H and later vers. of Sintran and MULTI vers.P. Until then,use T32K-MOS,MPM-MAINTENANCE's clear routine or turn power off/on after replacing BIG-MPN Data card (1143).

ND TECH. TIP No.:10. Issued by LB. May 10. 1984
NORD-10

INTERFACE PRIORITY IN ND-100 AND NORD-10

The following interfacepriority is recommended in ND-100 and NORD-10:

1. Communication DMA interfaces (HDLC, MEGALINK)
2. ND-500 interface
3. Unbuffered DMA interfaces (Mag.tape. Universal DMA etc.)
4. Buffered DMA interfaces (ECC disk, floppy DMA etc.)
5. Sync. modem interfaces
6. Other I/O interfaces (terminals, printers etc.)

ND TECH. TIP No.:13. Issued by LB. October 11. 1984
NORD-10

DISC-TEMA vers.G is not working properly on N-10 ECC DISK CONTROLLER. To run DISC-TEMA on this controller vers.F or older must be used. Later versions of this program will not be updated to run on this controller type.

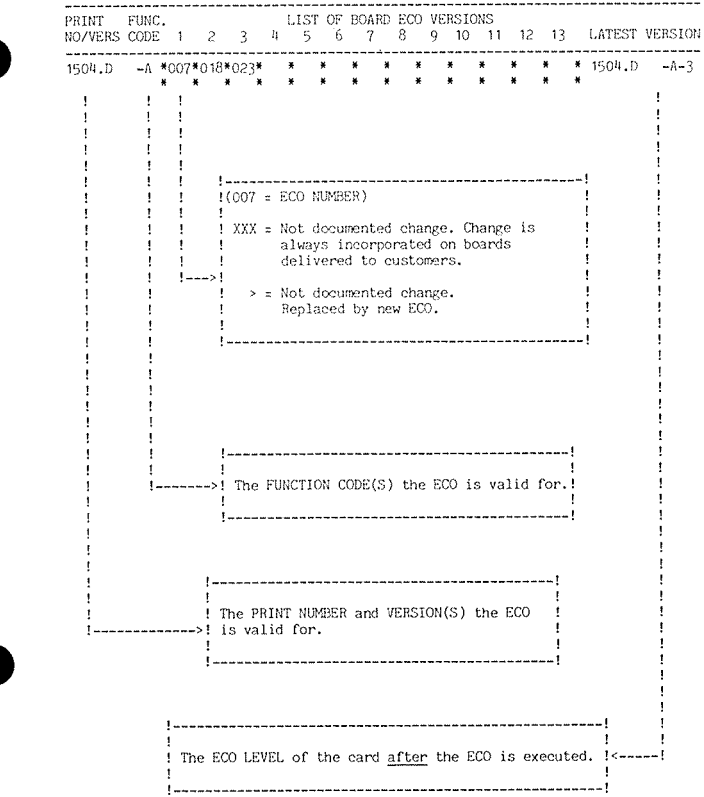
Chapter 5

NORD-50

NORD-50

Table of contents

EXPLANATION



PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
1500.	-A	*016*042*046*057*	*	*	*	*	*	*	*	*	*	*	*	*	1500. -A-4
1501.A	-A	* * * * *	*	*	*	*	*	*	*	*	*	*	*	*	1501.A -A-0
.B	-A	* * * * *	*	*	*	*	*	*	*	*	*	*	*	*	1501.B -A-0
.C	-A	* * * * *	*	*	*	*	*	*	*	*	*	*	*	*	1501.C -A-0
1502.A	-A	* * * * *	*	*	*	*	*	*	*	*	*	*	*	*	1502.A -A-0
.B	-A	* * * * *	*	*	*	*	*	*	*	*	*	*	*	*	1502.B -A-0
.C	-A	* * * * *	*	*	*	*	*	*	*	*	*	*	*	*	1502.C -A-0
1503.C	-A	*004* * * *	*	*	*	*	*	*	*	*	*	*	*	*	1503.C -A-1
.D	-A	* * * * *	*	*	*	*	*	*	*	*	*	*	*	*	1503.D -A-0
1504.D	-A	*007*018*023*	*	*	*	*	*	*	*	*	*	*	*	*	1504.D -A-3
.E	-A	*007*018*023*	*	*	*	*	*	*	*	*	*	*	*	*	1504.E -A-3
.F	-A	*023*026* *	*	*	*	*	*	*	*	*	*	*	*	*	1504.F -A-2
.G	-A	*023*026*	*	*	*	*	*	*	*	*	*	*	*	*	1504.G -A-2
.H	-A	*035* *	*	*	*	*	*	*	*	*	*	*	*	*	1504.H -A-1
.J	-A	* * *	*	*	*	*	*	*	*	*	*	*	*	*	1504.J -A-0
1505.A	-A	*010* *	*	*	*	*	*	*	*	*	*	*	*	*	1505.A -A-1
.B	-A	*010* *	*	*	*	*	*	*	*	*	*	*	*	*	1505.B -A-1
.C	-A	*010* *	*	*	*	*	*	*	*	*	*	*	*	*	1505.C -A-1
.D	-A	*010* *	*	*	*	*	*	*	*	*	*	*	*	*	1505.D -A-1
.E	-A	*010* *	*	*	*	*	*	*	*	*	*	*	*	*	1505.E -A-1
1506.A	-A	* * *	*	*	*	*	*	*	*	*	*	*	*	*	1506.A -A-0
.B	-A	* * *	*	*	*	*	*	*	*	*	*	*	*	*	1506.B -A-0
.C	-A	* * *	*	*	*	*	*	*	*	*	*	*	*	*	1506.C -A-0
.D	-A	* * *	*	*	*	*	*	*	*	*	*	*	*	*	1506.D -A-0
.E	-A	* * *	*	*	*	*	*	*	*	*	*	*	*	*	1506.E -A-0
.F	-A	* * *	*	*	*	*	*	*	*	*	*	*	*	*	1506.F -A-0
1507.C	-A	*052* *	*	*	*	*	*	*	*	*	*	*	*	*	1507.C -A-1
.D	-A	*034*040*052*	*	*	*	*	*	*	*	*	*	*	*	*	1507.D -A-3
.E	-A	*040*052*	*	*	*	*	*	*	*	*	*	*	*	*	1507.E -A-2
1508.B	-A	*011* *	*	*	*	*	*	*	*	*	*	*	*	*	1508.B -A-1
.C	-A	*011*	*	*	*	*	*	*	*	*	*	*	*	*	1508.C -A-1
1509.C	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1509.C -A-0
.D	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1509.D -A-0
.E	-A	* *	*	*	*	*	*	*	*	*	*	*	*	*	1509.E -A-0
1510.E	-A	*006*012*014*031*	*	*	*	*	*	*	*	*	*	*	*	*	1510.E -A-4
.F	-A	*031*036* *	*	*	*	*	*	*	*	*	*	*	*	*	1510.F -A-2
.G	-A	* * *	*	*	*	*	*	*	*	*	*	*	*	*	1510.G -A-0
1511.A	-A	* * *	*	*	*	*	*	*	*	*	*	*	*	*	1511.A -A-0
	-B	*045* *	*	*	*	*	*	*	*	*	*	*	*	*	1511.A -B-1
1512.A	-A	* * *	*	*	*	*	*	*	*	*	*	*	*	*	1512.A -A-0
.B	-A	* * *	*	*	*	*	*	*	*	*	*	*	*	*	1512.B -A-0
1513.E	-A	*005* *	*	*	*	*	*	*	*	*	*	*	*	*	1513.E -A-1
.F	-A	*028* *	*	*	*	*	*	*	*	*	*	*	*	*	1513.F -A-1

NORD-50 ECO CROSS REFERENCE
DATE: 831125

PRINT NO/VERS	FUNC. CODE	LIST OF BOARD ECO VERSIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	LATEST VERSION
1514.A	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1514.A -A-0
.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1514.B -A-0
.C	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1514.C -A-0
.D	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1514.D -A-0
1515.C	-A	*021*	*	*	*	*	*	*	*	*	*	*	*	*	1515.C -A-1
.D	-A	*021*	*	*	*	*	*	*	*	*	*	*	*	*	1515.D -A-1
.E	-A	*027*056*	*	*	*	*	*	*	*	*	*	*	*	*	1515.E -A-2
.F	-A	*056*	*	*	*	*	*	*	*	*	*	*	*	*	1515.F -A-1
1516.C	-A	*003*015*022*024*033*037*040*044*050*									*	*	*	*	1516.C -A-9
.D	-A	*022*024*033*037*040*044*050*									*	*	*	*	1516.D -A-7
.E	-A	*033*037*040*044*050*						*	*	*	*	*	*	*	1516.E -A-5
1517.A	-A	*038*	*	*	*	*	*	*	*	*	*	*	*	*	1517.A -A-1
1518.	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1518. -A-0
.C	-A	*053*055*	*	*	*	*	*	*	*	*	*	*	*	*	1518.C -A-2
1519.B	-A	*008*017*032*043*047*						*	*	*	*	*	*	*	1519.B -A-5
.C	-A	*032*043*047*			*	*	*	*	*	*	*	*	*	*	1519.C -A-3
1520.	-A	*048*051*054*			*	*	*	*	*	*	*	*	*	*	1520. -A-3
1521.B	-A	*025*	*	*	*	*	*	*	*	*	*	*	*	*	1521.B -A-1
1522.A	-A	*002*	*	*	*	*	*	*	*	*	*	*	*	*	1522.A -A-1
1523.C	-A	*001*	*	*	*	*	*	*	*	*	*	*	*	*	1523.C -A-1
.D	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1523.D -A-0
1524.A	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1524.A -A-0
.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1524.B -A-0
.C	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1524.C -A-0
.D	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1524.D -A-0
.E	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1524.E -A-0
1525.A	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1525.A -A-0
.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1525.B -A-0
.C	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1525.C -A-0
.D	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1525.D -A-0
1526.A	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1526.A -A-0
.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1526.B -A-0
.C	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1526.C -A-0
1531.A	-A	*029*	*	*	*	*	*	*	*	*	*	*	*	*	1531.A -A-1
1532.A	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1532.A -A-0
.B	-A	*	*	*	*	*	*	*	*	*	*	*	*	*	1532.B -A-0

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FUNCTION CODE DEFINITIONS FOR 15XX CARD

****

1511 B SPECIAL CARD IN POS. "C14" ECO 50-45

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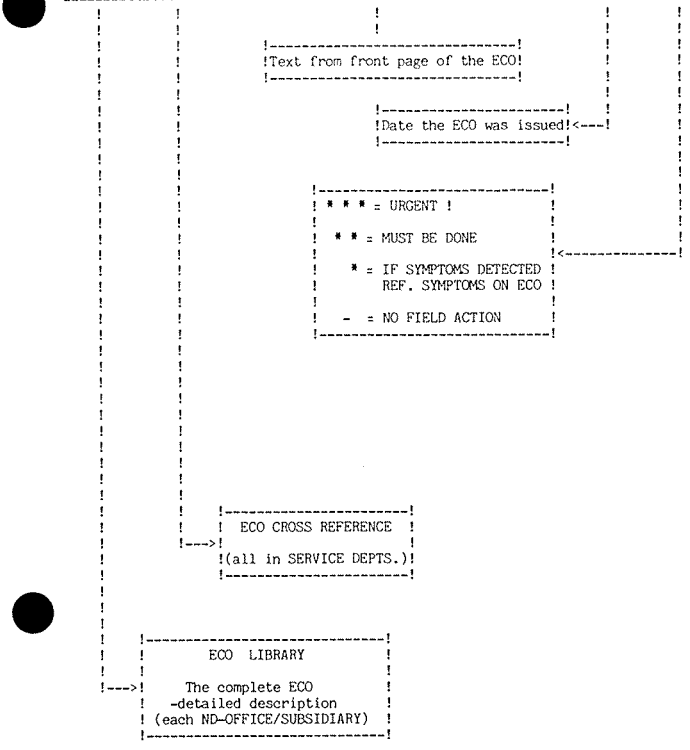
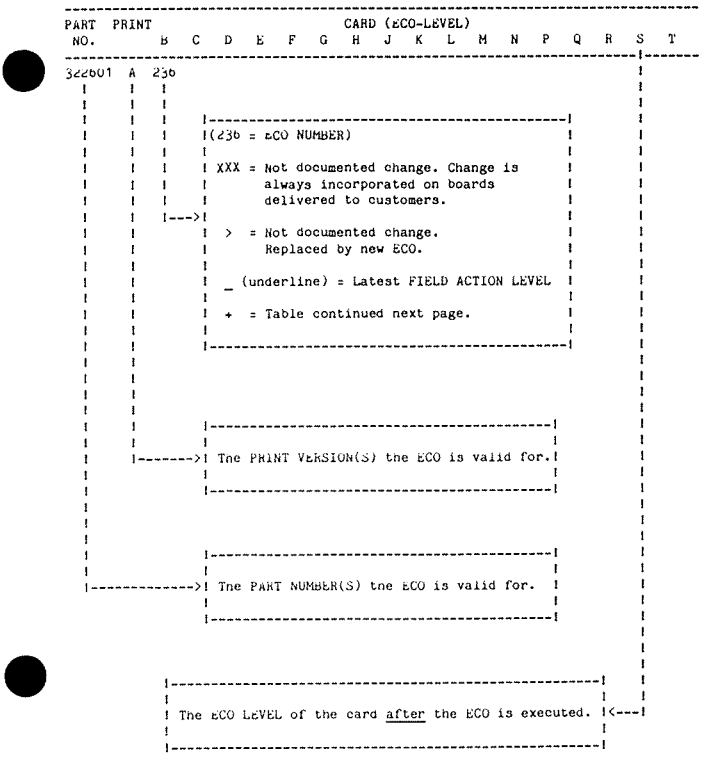
EXPLANATION



ECO NO.	PRINT NO:	SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
50-1	1523	Noise on signal SGLF1.	750918	
50-2	1522	Noise sensivity and noise generation of 74S182.	750918	
50-3	1516	PC-error on Floating Control 1516.C.	751022	
50-4	1503	PC-error on Arithmetic Buffer 1503.C.	751022	
50-5	1513	PC-error on Data Selector 1513.E.	751022	
50-6	1510	Marginal timing on indirect addressing in NORD-50.	751124	
50-7	1504	Marginal timing on parity error detection logic in NORD-50.	751124	
50-8	1519	Marginal timing on TIMING CONTROL 1519.	760120	
50-9		Misplaced decoupling capasitor on 1071.A, 1071.B & 1071C.	760126	
50-10	1505	Marginal timing - NORD-50.	760126	
50-11	1508	Marginal timing - NORD-50.	760126	
50-12	1510	Not valid any longer!	760209	
50-13	BACKW.	Not valid any longer!	760209	
50-14	1510	Marginal timing on count pulse to Program Counter.	760213	
50-15	1516	Speed-up of groups of instructions.	760325	
50-16	1500	Possibility for spikes on SP1 signal.	760325	
50-17	1519	Not valid any longer!	760329	
50-18	1504	Too early enabling of tri-state bus when reading back to NORD-10.	770711	
50-19		Master Clear in NORD-10 shall give STOP command to Nord-50. STOP command shall not give false interrupts.	760507	
50-20	BACKW.	Double length arithmetic right shift does not work for negative numbers. Bit 63 is forced to zero.	761028	
50-21	1515	Double length arithmetic right shift does not work for negative numbers. Bit 63 is forced to zero.	761028	
50-22	1516	Double length arithmetic right shift does not work for negative numbers. Bit 63 is forced to zero.	761028	
50-23	1504	Critical noise on modus signals M14 (data to/from NORD-10) and M15 (instructions from NORD-10) causes noise on Request to memory. This is sometimes decoded as two different requests.	761028	
50-24	1516	Marginal timing on Floating Register Skip (Double pres.)	770228	
50-25	1521	Too little space for some decoupling capacitors.	770624	
50-26	1504	The parity check enable window has to be delayed.	770810	
50-27	1515	Print error.	770906	
50-28	1513	Misplaced resistors on 1513.F arr.drawing	770906	
50-29	1531	The clear-input on IC 74174 has not pull-up resistor.	780222	
50-30		Noise on N-10/N-50 Data Bus.	780303	
50-31	1510	Marginal timing on count pulse to Program Counter.	781117	

ECO NO.	PRINT NO:	SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
50-32	1519	1. Change in timing due to static memory. 2. Increase in time out. 3. Design change.	781126	
50-33	1516	Marginal timing in floating operations.	781117	
50-34	1507	To achieve interrupt from N-50 on a special instruction RIO INT.	781101	
50-35	1504 BACKW.	After 5 years the NORD-50 is not able to simulate instructions via N-10 and refer data from N-50 memory.	781108	
50-36	1510	Print error.	781117	
50-37	1516	Noise between B and C rack.	790328	
50-38	1517	Noise between B and C rack.	790328	
50-39	BACKW.	Noise between B and C rack.	790328	
50-40	1516	Reduction on internal noise.	790514	
50-41	BACKW.	Logical left shift gives sign. bit 0.	790514	
50-42	1500	Replacement for ECO no. 50-16. Possible noise on SP1 signal.	790807	
50-43	1519	Marginal timing. NB! ECO 10-580 must be done in connection with this ECO. Replacement for ECO 50-32.	790807	
50-44	1516		790821	
50-45	1511	Arithmetic right shift in doble length gives constant 0 as sign after ECO 50-41.	800115	
50-46	1500	Wrong termination due to changes in Multiport.	800312	
50-47	1519	Marginal timing.	800222	
50-48	1520	The unofficial testprogram under SINTRAN "TEST-CLOCK" fails.	800514	
50-49 B	1507	To be able to use the two new N-50 instructions: CLEAR CLOCK and READ CLOCK.	801003	
50-50	1516	The 1516 Card FLOATING CONTROL shall be replaced with 1518 Card FLOATING CONTROL.	800528	
50-51	1520	EXTo signal is generated if bit 25 is set in instruction following a N-50 interrupt.	810130	
50-52	1507	N-50 clock is reset if Bit 26 is set in instruction following a N-50 interrupt.	810130	
50-53 B	1518	Floating Skip fails for a limited number of data combinations.	810113	
50-54 B	1520	This ECO will syncronize reading of the clock with the clockcycle to prevent clock from updating during a read cycle.	810915	
50-55	1518	There is a theoretical possibility that an external arithmetic instruction can disturb the next instruction if it is an external arithmetic instruction.	811014	
50-56	1515	Pick-up of noise sometimes gives wrong result in external arithm. instructions.	811014	
50-57	1500	Improvement of MULTIPLY and DIVIDE operations. Testprogram failing: N50-TEST-SYSTEM.	830526	*

EXPLANATION



PART NO.	PRINT	CARD (ECO-LEVEL) B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
000XX	(A)	259																
001XX	(A)	XXX 260																
006XX	(A)	WILL NOT BE UPDATED - REPLACED BY PROM 354XX (REF.ECO:100-426)																
007XX	(A)	302 403																
008XX	(A)																	
009XX	(A)																	
011XX	(A)																	
012XX	(A)	256																
013XX	(A)	030 031 047 067 068 069 071 078																
014XX	(A)	- 047 068 WILL NOT BE UPD.(REF.ECO:100-157)																
015XX	(A)	030 031 047 067 068 069 071 078 096 - 157 158 159																
016XX	(A)	- 047 - - - - - - 096 - 157 158																
017XX	(A)	030 031 047 - - - 071 - 096 113 157 158																
018XX	(A)	030 031 047 - - - 071 - 113 WILL NOT BE UPD.(REF.ECO:100-157)																
019XX	(A)	201																
020XX	(A)																	
021XX	(A)	XXX XXX XXX 275																
022XX	(A)	XXX XXX 275																
023XX	(A)																	
024XX	(A)	069 070 071 072 078 WILL NOT BE UPDATED																
025XX	(A)																	
026XX	(A)	069 070 071 072 078 096 112 - 124 125 161 162																
027XX	(A)	- - - - - - 096 - - - - 161																
028XX	(A)	- 070 071 - - 096 - 113 - - 161																
029XX	(A)	- - 071 072 WILL NOT BE UPDATED																
031XX	(A)																	
052XX	(A)	163																
053XX	(A)	163																
054XX	(A)	332																
055XX	(A)																	
056XX	(A)	240 365 431																
057XX	(A)																	
058XX	(A)																	
060XX	(A)																	
061XX	(A)																	
062XX	(A)																	
063XX	(A)	323																
064XX	(A)	322 388																
066XX	(A)	- - - - - - 321 410																
067XX	(A)																	
068XX	(A)																	
069XX	(A)																	
070XX	(A)																	
071XX	(A)																	
072XX	(A)																	

PART NO.	PRINT	CARD (ECO-LEVEL) B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
073XX	(A)	333																
074XX	(A)																	
075XX	(A)																	
085XX	(A)	273	301	375	490													
086XX	(A)	-	-	375														
087XX	(A)																	
088XX	(A)																	
089XX	(A)																	
090XX	(A)																	
091XX	(A)																	
092XX	(A)																	
093XX	(A)																	
094XX	(A)																	
095XX	(A)																	
308XX	(A)																	
309XX	(A)																	
315XX	(A)																	
316XX	(A)																	
317XX	(A)	429																
318XX	(A)																	
319XX	(A)																	
320XX	(A)																	
321XX	(A)																	
343XX	(A)	434																
344XX	(A)																	
345XX	(A)	434																
348XX	(A)																	
349XX	(A)	462	467															
354XX	(A)																	
363XX	(A)	461																

PART NO.	PRINT	CARD (ECO-LEVEL)																	
		B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	
322450	E	-	-	-	-	037			347										
322450	G	-	-	-	-	-	-	177	347										
322450	H	-	-	-	-	-	-	-	347										
322602	D	-	-	-	004	015	046	049	065	073	076	087	117	130	134	147	191	218	+
322602	E	-	-	-	-	014	046	049	065	073	076	087	117	130	134	147	191	218	+
322603	C	-	-	160	203	307	379	395											
322604	C	-	-	XXX	XXX	017	034	035	054	082	093	099	108	230	290	337	343		
322604	M	-	-	-	-	-	-	-	-	-	-	-	108	229	289	337	343		
322605	C	-	-	001	011	026	104	121	284	352									
322605	D	-	-	-	011	026	104	121	284	352									
322606	C	-	-	056	058	109	150	235	266	338	344	445	447						
322606	G	-	-	-	-	-	-	235	266	338	344	445	447						
322608	C	-	-	010	040	046	048	160	339										
322608	G	-	-	-	-	-	-	160	339										
322609	C	-	-	077	110	129													
322609	C	-	-	077	>	135	150	174											
322609	F	-	-	-	-	-	150	174											
322609	H	-	-	-	-	-	-	-											
322610	C	-	-	003	009	042	044	050	074	086	091	102	105	142	167	270	393	451	
322610	D	-	-	-	009	042	044	050	074	086	091	102	105	142	167	270	393	451	
322610	E	-	-	-	-	-	044	050	074	086	091	102	105	142	167	270	393	451	
322610	M	-	-	-	-	-	-	-	-	-	-	-	136	142	166	270	393	451	
322610	N	-	-	-	-	-	-	-	-	-	-	-	-	142	166	270	393	451	
322612	B	-	033	038	052	066	079	080	090	123	126	128	205	234	269	281	306		
322612	D	-	-	-	052	055	079	081	090	123	126	128	205	234	269	281	306		
322612	J	-	-	-	-	-	-	-	-	122	126	128	205	234	269	281	307		
322612	M	-	-	-	-	-	-	-	-	-	-	-	204	233	269	281	307		
322613	B	-	043	057	060	089	092	101	106	137	145	391							
322613	H	-	-	-	-	-	-	-	116	137	144	391							
322613	L	-	-	-	-	-	-	-	-	-	-	391							
322615	C	-	-	064	094	107	115	140	195	224	292	331	300	424	461				
322615	G	-	-	-	-	-	-	140	195	224	291	331	300	424	461				
322615	K	-	-	-	-	-	-	-	-	-	291	331	300	424	461				
322618	C	-	-	063	065	095	097	103	116	167	176	179	179	185	285				
322618	J	-	-	-	-	-	-	-	-	166	171	179	179	185	285				
322618	P	-	-	-	-	-	-	-	-	-	-	-	-	-	285				
322619	C	-	-	084	086	096	100	111	133	140	193	194	172	181	230	250	264	280	+
322619	H	-	-	-	-	-	-	-	133	140	193	195	173	182	230	250	264	280	+
322619	M	-	-	-	-	-	-	-	-	-	-	-	173	182	230	250	264	280	+
322619	P	-	-	-	-	-	-	-	-	-	-	-	-	-	230	250	264	280	+
322619	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	280	+

PART NO.	PRINT	CARD (ECO-LEVEL) U	V	W	X	Y	Z	BA	BB	BC	BD	BE	BF	BG	BH	BJ	BK	BL
322450	B																	
322450	G																	
322450	H																	
322602	D	340	403															
322602	E	340	403															
322603	C																	
322604	C																	
322604	M																	
322605	C																	
322605	D																	
322606	C																	
322606	G																	
322608	C																	
322608	G																	
322609	C																	
322609	F																	
322609	H																	
322610	C																	
322610	D																	
322610	E																	
322610	M																	
322610	N																	
322612	B																	
322612	D																	
322612	J																	
322612	M																	
322613	B																	
322613	H																	
322613	L																	
322615	C																	
322615	G																	
322615	K																	
322616	C																	
322616	J																	
322616	P																	
322619	C	314	390	409	410	427	472											
322619	H	314	390	409	410	427	472											
322619	M	314	390	409	410	427	472											
322619	P	314	390	409	410	427	472											
322619	R	314	390	408	410	427	472											

PART NO.	PRINT	CARD (ECO-LEVEL)																
		B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
322620	C	-	-	132	175	306	317	320	354									
322620	C	-	-	132	>	>	>	>	355	356	384							
322621	B	-	114	120	139	WILL NOT BE UPDATED - REPLACED BY 322628												
322622	C	-	-	119	141	151	164											
322622	C	-	-	119	141	>	165	180	193	381								
322622	G	-	-	-	-	-	-	180	194	381								
322622	J	-	-	-	-	-	-	-	-	381								
322623	B	-	149	197	319	330	425	460										
322623	D	-	-	-	319	330	425	460										
322624	B	-	127	210	251	311												
322626	C	-	-	216	241	316	417	455										
322627	C	-	-	169	189	207	310	400	441									
322627	E	-	-	-	-	207	318	400	441									
322627	F	-	-	-	-	-	318	399	441									
322628	B	-	138	146	152	256	294	309	374	413								
322629	C	-	-	200	300	396	426											
322630	C	-	-	006	012													
322630	D	-	-	-	012													
322631	C	-	-	007	013	027	104	121	284	352								
322631	D	-	-	-	013	027	104	121	284	352								
322633	C	-	-	-	016	041	044	050	074	088	091	102	105	143	188	279	393	452
322633	D	-	-	-	006	041	044	050	074	088	091	102	105	143	188	279	393	452
322633	E	-	-	-	-	-	044	050	074	088	091	102	105	143	188	279	393	452
322633	M	-	-	-	-	-	-	-	-	-	-	-	136	143	188	279	393	452
322633	N	-	-	-	-	-	-	-	-	-	-	-	-	143	188	279	393	452
322634	B	-	033	039	053	066	-	080	-	123	126	131	206	234	270	282	306	
322634	D	-	-	-	053	055	-	081	-	123	126	131	206	234	270	282	306	
322634	J	-	-	-	-	-	-	-	-	122	126	131	206	234	270	282	306	
322634	M	-	-	-	-	-	-	-	-	-	-	-	200	233	270	282	306	
322635	C	-	-	004	094	107	115	148	196	224	292	331	366	424	461			
322635	G	-	-	-	-	-	-	148	196	224	291	331	366	424	461			
322635	K	-	-	-	-	-	-	-	-	-	291	331	366	424	461			
322637	C	-	-	064	-	-	-	-	-									
322637	G	-	-	-	-	-	-	293	-	-								
322637	K	-	-	-	-	-	-	-	-	-	293	359						
322640	A	XXX	423	423														
322640	C	-	-															
322641	B	-	043	057	060	069	092	101	106	137	145	299	392					
322641	H	-	-	-	-	-	-	-	116	137	144	299	392					
322641	L	-	-	-	-	-	-	-	-	-	-	298	392					

PART NO.	PRINT	CARD (ECO-LEVEL)
322650	A	
322660	C	- - 190 211 222 237 243 246 474
322660	G	- - - - - - 245 246 474
322661	C	- - 183 199 201 214 219
322661	C	- - 183 199 201 > 220 225 242 248 249 253 262 277 283 334 370 +
322661	D	- - - 199 202 215 219
322661	D	- - - 199 202 > 221 226 242 248 249 252 262 277 283 334 370 +
322662	C	- - 184 198 212 223 236 239 247 263 296 326 368 385
322662	D	- - - 198 213 223 236 239 247 263 296 326 368 385
322663	B	- 271 274 276 295 305 313 329 341 349 358 362 373 380 382 412 440 +
322663	E	- - - - 303 305 313 329 341 349 358 362 373 380 382 412 440 +
322663	S	- - - - - - - - - - - - - - - - 440 +
322664	B	- 257 470
322665	C	- - 315
322666	A	
322667	D	- - - 401
322669	A	280 312 335 353 369 377 390 458
322670	A	
322671	B	- 404 430 446 456 464 466
322671	E	- - - - 456 464 466
322672	A	
322673	B	- 449 463 469 473 487
322673	C	- - 463 469 473 487
322674	B	- 450 457 465 471 489
322674	C	- - 466 465 471 489
322676	A	
322690	C	- - 059
322691	C	- - 061 170
322693	A	
322703	D	- - - - XXX 192
322700	A	XXX 244
322770	A	062
322780	A	WILL NOT BE UPDATED - REPLACED BY 324470 (REF.ECO:100-443)

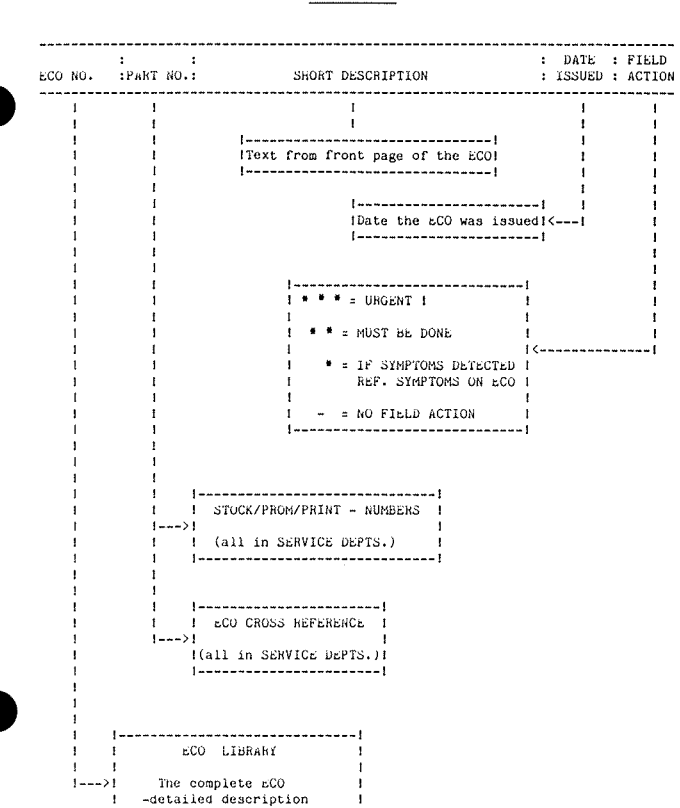
PART NO.	PRINT	CARD (ECO-LEVEL) U	V	W	X	Y	Z	BA	BB	BC	BD	BE	BF	BG	BH	BJ	BK	BL
322650	A																	
322660	C																	
322660	G																	
322661	C	376 389																
322661	D	376 389																
322662	C																	
322662	D																	
322663	B	484																
322663	E	484																
322663	S	484																
322664	B																	
322665	C																	
322666	A																	
322667	D																	
322669	A																	
322670	A																	
322671	B																	
322671	E																	
322672	A																	
322673	B																	
322673	C																	
322674	B																	
322674	C																	
322676	A																	
322690	C																	
322691	C																	
322693	A																	
322763	D																	
322766	A																	
322776	A																	
322786	A																	

PART NO.	PRINT	CARD (ECO-LEVEL) B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
322991	A																	
324001	E	-	-	-	-	297	345	357	387	433	459							
324002	D	-	-	-	394													
324003	B	-	414	421														
324004	B	-	325	346	350	361	415	438	454	466	488							
324004	E	-	-	-	-	361	415	438	454	466	488							
324004	G	-	-	-	-	-	-	438	454	466	488							
324005	B	-	327	402														
324006	C	-	-	397	435	442												
324006	D	-	-	-	435	442												
324007	A	328	419															
324007	B	-	419															
324008	C	-	-	444	446	482	485											
324009	A																	
324010	B	-																
324011	A	430																
324012	B	-	491															
324014	B	-	475	477	480													
324101	B	-	257	470														
324102	B	-	257	470														
324105	A	206	209	217	231	254	267	310	287	WILL NOT BE UPDATED								
324105	B	-	209	217	232	254	265	272	287	304	324	336	342	360	371	376	383	406 +
324105	E	-	-	-	-	254	266	272	288	304	324	336	342	360	371	376	383	406 +
324105	N	-	-	-	-	-	-	-	-	-	-	-	-	-	383	372	376	383	405 +
324106	C	-	-	164	196	212	223	236	239	247	263	296	326	366	386			
324106	D	-	-	-	196	213	223	236	239	247	263	296	326	366	386			
324106	K	-	-	-	-	-	-	-	-	-	263	296	326	366	386			
324107	B	-	325	346	351	361	416	439	>	479	488							
324107	E	-	-	-	-	361	416	439	>	479	488							
324107	G	-	-	-	-	-	-	439	>	479	488							
324108	A	328	420															
324108	B	-	420															
324110	C	-	-	444	446	482	485											

PART NO.	PRINT	CARD (ECO-LEVEL) U	V	W	X	Y	Z	BA	BB	BC	BD	BE	BF	BG	BH	BJ	BK	BL
322991	A																	
324001	E																	
324002	D																	
324003	B																	
324004	B																	
324004	E																	
324004	G																	
324005	B																	
324006	C																	
324006	D																	
324007	A																	
324007	B																	
324008	C																	
324009	A																	
324010	B																	
324011	A																	
324012	B																	
324014	B																	
324101	B																	
324102	B																	
324105	A																	
324105	B	411																
324105	E	411																
324105	N	407																
324106	C																	
324106	D																	
324106	K																	
324107	B																	
324107	E																	
324107	G																	
324108	A																	
324108	B																	
324110	C																	

PART NO.	PRINT	CARD (ECO-LEVEL) B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
324111	A	422 437 476																
324113	A																	
324116	C	-	-	463 469 473 487														
324117	C	-	-	468 465 471 489														
324118	A	422 476 478																
324119	A	430																
324404	B	-	227 432															
324406	A	226 255																
324406	C	-	-															
324407	B	-	346															
324409	B	-																
324410	D	-	-	-														
324457	A	364																
324467	B	-	453															
324470	A																	
324471	A																	
324472	B	-																
324473	B	-																
324477	B	-																
324478	A																	
324479	A																	
324480	A																	
324483	A																	
324493	D	-	-	-														

EXPLANATION



ECO NO.	PART NO.	SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-001	322605	Design error	790212	
100-002	322450	Memory Inhibit missing	790212	
100-003	322610	Malfunction	790212	
100-004	322602	Print errors	790212	
100-005	322606	Print errors	790213	
100-006	322630	Design error	790212	
100-007	322631	Design error	790212	
100-008	322633	Print error	790315	
100-009 B	322610	Print error	790212	
100-010 B	322608	Decoupling capacitors missing	821005	
		Change of termination resistors		
100-011 B	322605	Memory errors after Power Fail	821112	
100-012	322630	Memory errors after Power Fail	790320	
100-013	322631	Memory errors after Power Fail	790320	
100-014 B	322602	Refresh does not work during power fail	820505	
		Noise on clock		
100-015	322602	Refresh does not work during power fail	790315	
100-016	322633	Print errors	790321	
100-017 B	322604	Design improvements.	820915	
100-018		Print errors	790423	
100-019		BINT 11o is driving Low + Design error	790419	
100-020		Design error	790410	
100-022		Misc. errors	790507	
100-023		Misc. errors	790507	
100-026 B	322605	Error in Memory IC specs from some	830113	
		manufacturers		
100-027	322631	Error in Memory IC specs from some	790510	
		manufacturers		
100-028 B	322608	Too short address data set-up time before	821005	
		IOXE and IDENT		
100-029		Print errors	790530	
100-030 B		Error in SWAP-instruction	790529	
100-031 B		Errors in handling of internal interrupts	790523	
100-033 B	322612	Misc. errors.	830310	
	322634			
100-034 B	322604	Design improvements.	820915	
100-035 B	322604	Error in ECO:100-034. Error in arrang.-	820915	
		drawing		
100-036		Print error. Error in ECO 100-029	790823	
100-037	322450	Backwiring error	790824	
100-038 B	322612	Misc. errors.	830829	
100-039 B	322634	Misc. errors.	830829	
100-040 B	322608		821007	
100-041	322633	Error in 100-019	790827	
100-042 B	322610	Error in 100-020	790827	
100-043 B	322613	Design error. Address bits to register	801120	
	322641	file for programable baud rate interch.		
100-044 C	322610	Design err. Address bits to register file	810225	* *
	322633	for programable baud rate interchanged.		
100-045				
100-046 B	322608	Block switch does not work	821015	* *
100-047	322602	Commersial instruction set included in uP	790902	* *
100-048 D	322602	Wrong polarity on write-pulse to write-	830210	
		able control store,improvements to		
		current loop input.		
100-049 B	322602	Too heavy loading on signal (DRY).	830124	

ECO NO.	PART NO.	SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-050 B	322610	Corrections to print and arrangements	791001	
	322633	Corrections to print and arrangements	791001	
100-051				
100-052 B	322612	Chache-test program failing(used biterror)	830829	* *
100-053 B	322634	Calendar failing at MASTER CLEAR and POWER fail	830829	* *
100-054 D	322604	DIMS, TECOD and MCOPY failing	821112	
100-055 B	322612	Abnormal stop of SINTRAN, miscellanous	830829	
	322634	symptoms occur.Allow calendar to be read by program.		
100-056	322606	Arrangement error	791029	
100-057 B	322613	Missing information on arrangement-	801126	
	322641	drawing.		
100-058	322600	Sintran stops in ERRFATAL and indicates MEM. out of range from DMA-device	791030	
100-059	322690	OPCOM button on display panel does not work	790918	
100-060 B	322613	Hangup on terminals. Arrangementdrawing	801126	* *
	322641	errors.		
100-061	322691	Error in self-test	790920	
100-062	322776	Cut two corners to allow access to hidden screws	790920	
100-063 B	322637	NOT VALID. Replaced by Engineering Specification No.: 82-027.	820308	
100-064	322615	Invert polarity on thumb wheels	800219	
	322635	Invert polarity on thumb wheels	800219	
	322637	Invert polarity on thumb wheels	800219	
100-065 C	322602	Movers under SINTRAN will indicate data errors when swapping.	830124	* * *
100-066	322612	Abnormal stop of SINTRAN, miscellanous	791113	* *
	322634	symptoms occur		
100-067	013XX	SIMULA and PLANC do not work	791114	*
	015XX	SIMULA and PLANC do not work	791114	
100-068	013XX	SIMULA and PLANC do not work	791114	*
	015XX	SIMULA and PLANC do not work	791114	
100-069	013XX	Error in MOVB and MOVBF	791114	
	015XX	Error in MOVB and MOVBF	791114	
	024XX	Error in MOVB and MOVBF	791114	
	026XX	Error in MOVB and MOVBF	791114	
100-070	024XX	DNZ with answer 0 executes next	791129	* * *
	026XX	instructions incorrectly	791129	
	026XX	instructions incorrectly	791129	
100-071	013XX	MOVB/MOVBF causes illegal "pagefault"	791129	* *
	015XX	MOVB/MOVBF causes illegal "pagefault"	791129	
	017XX	MOVB/MOVBF causes illegal "pagefault"	791129	
	016XX	MOVB/MOVBF causes illegal "pagefault"	791129	
	024XX	MOVB/MOVBF causes illegal "pagefault"	791129	
	026XX	MOVB/MOVBF causes illegal "pagefault"	791129	
	026XX	MOVB/MOVBF causes illegal "pagefault"	791129	
	029XX	MOVB/MOVBF causes illegal "pagefault"	791129	
100-072	024XX	Execution - F32 - failing	791130	* *
	026XX	Execution - F32 - failing	791130	
	029XX	Execution - F32 - failing	791130	
100-073 B	322602	IOX-errors occuring, which are in fact no IOX-errors, but an abnormal termination of a granted refresh request.	830202	* *

ECO NO.	PART NO.	SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-074	322610	Configuration Investigator does not find	800122	
	322633	ident code when RS32-C mode and no		
		terminal connected. Stops printing in		
		SINTRAN.		
100-075		To avoid turning of the 5V voltage with	791220	
		the key switch in stand by position		
100-076 B	322602	On most N-100's the data from PES and PEA	830202	
		is not valid due to marginal timing when		
		locking those registers		
100-077	322609	THEPU fails. Necessary to add pull-up	800121	
		on upper byte of N-10 bus.		
100-078	015XX	IOX 303 will clear "Ready-for-transfer"	800206	*
	015XX	IOX 303 will clear "Ready-for-transfer"	800206	
	024XX	IOX 303 will clear "Ready-for-transfer"	800206	
	026XX	IOX 303 will clear "Ready-for-transfer"	800206	
100-079	322612	Uncontrolled stop or hangup of SINTRAN	800208	* * *
		when cache is enabled		
100-080	322612	SINTRAN stops during startup	800213	*
	322634	SINTRAN stops during startup	800213	
100-081	322612	SINTRAN fails during startup	800213	*
	322634			
100-082 B	322604	Testprograms give data error. Double	830113	* *
		DWC pulses.		
100-083	322616	Status and data error.	800304	
100-084 B	322619	Status and data error.	800324	
100-085 B	322616	Disc status error (bit 8 and 9).	800306	
100-086 C	322619	Disc status error.	800428	
100-087 B	322602	During contineous DMA-demand, the CPU is	830202	
		jammed without this ECO.		
100-088	322610	1 resistor misplaced, 1 resistor missing	800317	* *
	322633	1 resistor misplaced, 1 resistor missing	800317	
100-089 B	322613	Function is not identical to N10-11222/11147	801126	* *
	322641	Some test-prog. are failing in RS 232-C.		
100-090 B	322612	Cache not correct. cleared aft. Power Fail	800426	
100-091	322610	Increase the current in both input and	800325	*
	322633	output loops.	800325	
100-092 C	322613	Increase the current in both input and	810305	*
	322641	output loops.		
100-093 B	322604	False DEVDWC (decrement word count)	830113	* *
		pulses during formatting.		
100-094	322615	DMA-cycle timing improvement. Testprog.	800424	
	322635	HDLC-2-2370A sometimes stops when running	800424	
		Extended-Loop Test between two interfaces		
		and using MPM.		
100-095	322618	Phoenix disk may destr.data during vol.ch.	800411	* * *
100-096	015XX	N-100 u Prog. update in connection with	800411	
	016XX	introd. of 2K x 4 PROM-packages.		
	017XX			
	026XX			
	027XX			
	028XX			
100-097	322618	Data error. Status error, bit 6 & 9.	800421	* *
		Formatting error on Unit 2.		
100-098 B	322619	Data error. Missing pull-up. Improve	800512	* *
		noise margins on SB8, SB9, SB10.		
100-099 B	322604	Two sources to the internal bus at the	830113	
		same time.		

ECO NO.	PART NO.	Volume-1 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-100	322619	BIGFUNC failing (SB6). Missing clear on sector counter FF. Wrong polarity on Tantalum capacitor C3.	800512	* *
100-101 B	322613 322641	Conf. Inv. & SINTRAN fails now and then. This is caused by a spike on CWo, which cleares the Interrupt enable signal.	801128	
100-102	322610 322633	Conf. Inv. & SINTRAN fails now and then. This is caused by a spike on CWo, which cleares the Interrupt enable signal.	800519	
100-103	322618	GREMS and BIGFUNC give STATUS ERROR during formatting, STATUS = 054130, due to false DWRQ pulses.	800523	* *
100-104	322605 322631	Undefined errors may occur due to too short set-up time on flip-flop Ic.	800528	
100-105	322610 322633	Noise generated as both data drives and Identcode drivers are enabled during IDENT (Terminal part).	800620	
100-106 B	322613 322641	Noise generated as both data drivers and Identcode drivers are enabled during IDENT.	801128	
100-107 B	322615 322635	IDT HASP WORK STATION does not work. Impossible to write transmitter transfer control from microprogram.	800822	*
100-108 B	322604	Marginal timing between BMEM and GRANT (gives MOR). Wrong data in test-mode.	800827	* *
100-109 B	322606	Two sources to the internal bus at the same time. Marginal timing between BMEM and GRANT (Gives MOR).	800908	* *
100-110	322609	Bit 4 undefined from some N-10 cards (1010/1020). SINTRAN routines test on this bit (or of errors in status). INPUT kept too long after IOXE from some N-10 cards (Norcontrol), causing next memory access to fail.	800804	
100-111	322619	BIGFUNC gives memory address register error, due to false clear to upper/lower flip-flop.	800813	* *
100-112	026XX	32-bit floating underflow gives overflow in 50% of the cases.	800812	* *
100-113	017XX 016XX 020XX	Hazardous timing when REG-FILE is accessed in FAST-cycle and conditional branching following. Also hazardous condition when memory write without two "waits" following.	800818	* *
100-114	322621	Fatal.	800818	
100-115 B	322615 322635	1. Spikes generated on INPUT at 307 KBit/s. 2. Changes made to facilitate testing.	800918	
100-116 B	322610	GREMS failing on marginal low voltage during compare function. Status 54133. can be unit dependent.	801030	
100-117 B	322602	Overrun on disk on systems with BEX (Bus Expander).	801110	*
100-118 B	322613 322641	Noise generated as both data drivers and Identcode drivers are enabled during IDENT.	801128	

ECO NO.	PART NO.	Volume-1 SHORT DESCHIPTION	DATE ISSUED	FIELD ACTION
100-119 B	322622	Will create interrupt on level 12 whenever this level is active.	820514	
100-120	322621	Neccessary on all boards. Board will not function at all without these changes.	801104	
100-121 B	322605	Memory failing at addresses above 512K, due to missing decoupling capacitor. False light in yellow indicators.	801203	* * *
100-122	322612	Cache may fail due to arrangement drawing error.	801105	* *
100-123	322612	Dummy upgrading of version.	801105	
	322634	(Ref. ECO 100-122)		
100-124	026XX	32-bit floating divide never gives floating over-/under-flow.	801009	* *
100-125	026XX	32-bit floating divide gives too much overflow.	801015	* *
100-126	322612	Programs using cache and/or shadow are	801107	* * *
	322634	failing when many cards are put in one rack. Potential problems with 20 position racks.		
100-127	322624	Missing IDENT on level 13 & 11. Not BUSY during BLOCK. Two connections to innerlayer GND. Misplacem. of capacitor.	801107	
100-128	322612	Cache test and Sintran failing when there are many cards in the N-100-bus. Cache tables are filled with wrong pagenumber.	801111	* * *
100-129	322609	This error is only visible if 322609 is placed in a B-rack. Production test program for testing 322609 with 1041/1042 installed shows error.	801119	
100-130	322602	PES & PEA are not always valid with fast-option CPU. They should be unlocked on trailing edge of EPEAO.	801121	
100-131	322634	Dummy upgrading of version. (Ref. ECO 100-126)	801112	
100-132 B	322620	STC Testprog. fails if 74LS112 is FAIRCHILD. FAIRCHILD 74S112 is OK.	821201	* *
100-133 B	322619	Misplaced capacitor (wrong polarity).	810114	
100-134	322602	Marginal enabling of adress and/or data from CPU. ECO 100-117 has to be compleated first.	801124	*
100-135	322609	This error is only visible if 322609 is placed in a B-rack. Production test program for testing 322609 with 1041/1042 shows error. Bit 4 undefined.	801119	*
100-136	322610	Noise generated as both data drivers and Identcode drivers are enabled during IDENT (Terminal part). Misc. print errors.	801203	* *
100-137	322613	Characters are lost in the communication	801124	*
	322641	with the terminals connected to the channels far away from the C-plug. Reason is noise on MCL, to this part of card. It has effect only when V24 is used.		
100-138	322620	Fatal.	801216	* * *
100-139	322621	B-memory might lose refresh if B-DMA. Too big nysteresis on POWERSENSE in A-crate. MULTI blew up. No error message.	801107	* * *

ECO NO.	PART NO.	Volume-2 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-140	322619	BAPR too short in a loaded bus.	810122	*
100-141 B	322622	Design errors. Logic diagram error. Arrangement drawing error.	810226	* * *
100-142	322610	Floppy controller not stable on long cables.	810123	*
100-143	322633	Dummy upgrading of version (Ref. ECO 100-142).	810122	
100-144	322613 322641	Print error. Missing connection between capacitor C6 and GND. (Group A RS232-C channel 2.)	810218	*
100-145	322613 322641	Dummy upgrading of version. (Ref. ECO 100-144.)	810220	
100-146	322628	Arrangement drawing error.	810225	
100-147 B	322602	Modification to make it possible to install 4K micro-program (commercial option etc.).	810325	
100-148	322615 322635	Faster termination of DMA-cycles (to avoid trouble on long GRANT chains).	810324	
100-149	322623	Faster termination of DMA-cycles (to avoid trouble on long GRANT chains).	810323	
100-150	322606	Device clear not sufficiently OR-ed with master clear.	810324	
100-151 B	322622	Marginal IOX-timing. Print and Logic diagram error.	810610	* * *
100-152 B	322628	Memory error in B-rack after Power Fail. Detected by Multi. Cause: Missing refresh during Power off. Marginal set-up of FF generating LMCL.	830421	* *
100-153	322619	CONFI.INV. and GREMS give wrong identcode due to undefined upper byte on DB-bus when reading identcode.	810818	
100-154	322619	Print error. Prevents starting a DMA-cycle when a return to Zero Seek(M7-0) is executed.	810820	
100-155	322619	Prevents starting a DMA-cycle when a return to Zero Seek (M7-0) is executed.	810820	
100-156 B	322609	HAR 1399 TREAL fails. It is necessary to add pull-up on lower byte of the N-10 bus, due to redundant signal lines when reading status.	810716	*
100-157	015XX 016XX 017XX	The instruction set is extended with the PLANC-ENTR, INIT, LEAV and ELEAV-instr. The TRN IIE instr. has been corrected.	810724	
100-158	015XX 016XX 017XX	FAD a FSB is corrected so small + big equals big + small. Store * + 1 is no longer dangerous.	810724	*
100-159	015XX	The PLANC-instructions are made available only together with commercial instr. set.	810724	*
100-160	322603	Short circuit between MDR-0 and +5V. Card test failing.	810811	
100-161	026XX 027XX 026XX	The PLANC-routines INIT, ENTR, LEAV and ELEAV are implemented store * + 1 is no longer dangerous.	810724	*
100-162	026XX	The PLANC-instructions are made available only together with commercial instr. set.	810724	*

ECO NO.	PART NO.	Volume-2 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-163	052XX 053XX	The GECO-instruction is implemented.	810724	*
100-164	322622	Error in ECO:100-151. Noise on DBAPR-1.	810827	* * *
100-165	322622	Marginal IOX-timing. Noise on DBAPR-1. Print and Logic diagram error.	810827	* * *
100-166	322618	BUSYCL-0 is wrongly connected to 20D4. Card test failing.	810824	
100-167	322618	Dummy upgrading of version. (Ref. ECO:100-166 and ECO:100-085 Rev.B)	810824	
100-168	322606	Memory Out of Range (MOR) due to unnecessary latching of request signal. Makes the request handling similar to 3024.	810902	*
100-169 B	322627 324104	1. Too short set-up time on Data Input. 2. Makes it possible to simulate DMA-load.	811203	
100-170	322691	Reduce 9 Volt to 8,8 Volt to allow more types of displays.	810909	
100-171 B	322618	GREMS, BIG-FUNC and SUPER RANDOM may give status error bit 6 and 11 during write due to false DWRQ-0. This symtom has only been detected on Phoenix.	811007	* *
100-172	322619	Print error. Missing connection to R13.	810923	
100-173	322619	Dummy upgrading of version. (Ref. ECO:100-172)	810922	
100-174	322609	The card fails in DIG-IO test. The connect signal becomes too short due to the low capacitance.	810924	
100-175	322620	Test-program MINTAN fails in SINTRAN. Error in writing on tape. Double CPO clock: clock frequency, then OK. This option is disabled in test-mode	810930	*
100-176	322618	GREMS, BIG-FUNC and SUPER RANDOM may give status error bit 6 and 11 during write due to false DWRQ-0. This symptom has only been detected on Phoenix.	811007	* *
100-177	322650	Print errors in layer 1(solderingside) and layer 2(ground layer).	811014	
100-178	322610	GREMS failing (status bit 6 & 7). a)Spikes on 26H5 may cause wrong formatting. b)Noise on 10F3 and 11H2(X2-0): due to missing groundplane near edge of card.	811119	*
100-179	322618	ECC test may give status error and ECC count error due to async. start of ECC operation.	811029	* *
100-180 B	322622	Fatal system error: Impossible to terminate N500. (N500 INTERFACE must be placed before buffered DMA INTERFACE, because software timeout may occour when N500 uses DMA).	811203	* *
100-181	322619	GREMS failing(status bits 10 & 6). a)Too short DMAWE-0 due to unsymmetric clock. b)Too short timeout for MMD(Return to zero seek).	811130	*

ECO NO.	PART NO.	Volume-2 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-102	322019	GREMS failing(status bits 10 & 6). a)Too short DMAWE-0 due to unsymmetric clock. b)Too short timeout for MMD(Return to zero seek).Note:BIGFUNC 1024 up to version: I will give error in status bit 6 test & operation test after this ECO is done.	811130	*
100-103 B	322001	Design, print, Arrangement Drawing and Logical Diagram errors.	820215	
100-104 E	322002	Design error.	820624	* *
	324106			
100-105	322018	Spikes on PHb may give status error, bit 6 and 9.	820107	*
100-106 B	322010	Print error. Missing connection between R39-1 and 19F4.	820120	
100-107	322010	Dummy upgrading of version. (Ref. ECO:100-106).	811127	
100-108	322033	Dummy upgrading of version. (Ref. ECO:100-106).	811127	
100-109	322027	Misc. print error 15B4 and R34 are missing 5V.	811202	* *
	324104			
100-110	322000	Avoiding dummy cycles.	811216	
100-111	322002	In certain cases BMEM-0 may overload the 13F9 input and damage the circuit 13F.	820111	
100-112	322003	When Shugart formatter(SA 8000) is removed from Floppy-rack and replaced by 3027 card, and drive ND 310 is still used.	811210	*
100-113	322022	Noise on BMINH-0 causes N500 stop.(Error in ECO:100-141). Errormessage is: Impossible to terminate ND 500 without any stopreason.	811214	*
100-114	322022	Noise on BMINH-0 causes N500 stop. See ECO:100-113.	811217	*
100-115	322015	Following power-up, the interface will sometimes keep STOP on. This ECO causes The "CLOAD"-function to be removed from this module.	820112	*
100-116	322035	Dummy upgrading of version. (Ref. ECO:100-115)	820111	
100-117	322023	Following power-up, the interface will sometimes keep STOP on. This ECO causes the "CLOAD"-function to be removed from this module.	820112	*
100-118 C	322002	Memory out of range. Detected as noise	820624	
	324100	pulses on differential Data Ready signal		
		when running ND-500.		
100-119	322001	Double enabling on internal bus. Failing local cycles collides with PIO cycles on BUSC.	820128	

ECO NO.	PART NO.	Volume-3 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-200	322629	Noise on WCZERO-0. Marginal setting of interrupt enable flip-flops.	820204	
100-201 C	322661	Timeouts reported from ND-500.	820414	* * *
100-202 B	322661	Timeouts reported from ND-500:	820416	* * *
100-203 B	322603	Necessary changes for MPM4.	820524	
100-204 C	322612	Cache clear may fail after Master Clear. Print error.	820322	
100-205 C	322612	Cache clear may fail after Master Clear.	820330	
100-206	322634	Dummy upgrading of version. (Ref. ECO:100-204 and 100-205).	820211	
100-207 B	322627 324104	Prevent spikes from output of 14D when the select-input is changed.	820624	* *
100-208	324105	Design errors.	820305	
100-209	324105	False RTZ. Never SB8. False BREQ during M7:	820312	
100-210	322624	Extension of memory address area.	820312	*
100-211	322660	Powerfail on mulitple crate systems causes hangup if the poerfail occurs only on a part of the system.	820312	* *
100-212 B	322662 324106	Memory timeouts reported from ND-500. Improves noise margin on BMEM-0 signal. (Continuation of ECO:100-184 Rev. C).	820624	* *
100-213 C	322662 324106	Memory timeouts reported from ND-500. Improves noise margin on BMEM-0 singal.	820624	
100-214	322661	Refresh drop-outs during power-up sequence. MULTI reports parity error from memory after powerfail.	820316	* *
100-215	322661	Refresh drop-outs during power-up sequence. MULTI reports parity-error from memory after powerfail.	820316	* *
100-216	322626	Design errors.	820325	
100-217	324105	False SB9. Missing pull-up.	820325	*
100-218 B	322602	Increases timeout. Avoids MOH with MPM4. Necessary only with MPM4.	820427	*
100-219	322661	Error in ECO:100-214 and ECO:100-215.	820325	* *
100-220	322661	Refresh drop-outs during power-up sequence. MULTI reports parity-error from memory after powerfail.	820402	* *
100-221	322661	Refresh drop-outs during power-up sequence. MULTI reports parity-error from memory after powerfail.	820423	* *
100-222 B	322660	Handshake on XACC-0 necessary.	820420	*
100-223 C	322662 324106	Incorrect read-enabling of data.	820624	* *
100-224 B	322615 322635	Necessary change to disconnect X-21 lines according to X-21 specifications. X-21 will not work under SINTRAN B without this change.	820617	*
100-225	322661	Several improvements in bus arbiter.	820423	* *
100-226	322661	Several improvements in bus arbiter.	820430	* *
100-227	324404	Single-row resistorpack has no 5V SB connected.	820430	* *
100-228	324406	Indent, Ingrant and Incontrol is lacking in backwiring position 2.	820430	
100-229	322604	Arrangement and print error.	820507	
100-230	322604	Dummy upgrading of version. (Ref. ECO:100-229)	820426	

ECO NO.	PART NO.	Volume-3 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-231	324105	Selection between 14Mb or 21Mb disk is moved from card to cable.	820507	*
100-232	324105	Selection between 14Mb or 21Mb disk is moved from card to cable.	820511	*
100-233	322612	Print error. Impossible to lock	820511	*
	322634	OPCOM-button on op. panel.		
100-234	322612	Dummy upgrading of version.	820510	
	322634	(Ref. ECO:100-233)		
100-235	322606	Mag tape Test Progr. HAR 1559E failing due to spike on DWC-signal.	820519	*
100-236 B	322602	WRITE PARITY ERROR if enabled.	820624	
	324106			
100-237	322606	Memory timeouts reported when the ND-100 timeout is increased beyond the refresh time interval.	820527	
100-238	322619	Makes it possible to read less than one sector. (Necessary for spare track allocation, SINTRAN H-version). False setting of SB11.	820519	* *
100-239 B	322602	False grant-catches of unconnected ports.	820624	*
	324106			
100-240	056XX	READ-FORMAT command changed-possible to read format on all tracks. Retries on DELETED-RECORD removed. Fails under FLOCON from version F and up.	820610	*
100-241	322626	Remove false request on input.	820610	*
100-242 B	322601	False MPM4 interrupt. Status bit parity error not latched. Memory out of range.	820617	*
100-243	322606	Hang-up after Power Fail in Master Crate.	820610	*
100-244 B	322706	Arrangement drawing error.	820624	
100-245	322606	Hang up after Power Fail in parts of system.	820616	*
100-246	322606	Missing handshake on BDAP/BDRY.	820625	* *
100-247 B	322602	N500: Parity error on data channel.	820624	* *
	324106			
100-248	322601	Marginal writing in cache from MPM4.	820701	*
100-249	322601	Incorrect data read on 10X-cycles.	820706	*

ECO NO.	PART NO.	Volume-4 SHORT DESCHIPTION	DATE ISSUED	FIELD ACTION
100-250 B	322619	Dummy upgrading of version.	820709	
100-251	322624	Improvement on BAPR-0 shape.	820702	*
100-252	322001	Print error.	820706	
100-253	322001	Dummy upgrading of version. (Ref. ECO:100-252).	820707	
100-254 B	324105	Dual signal source.	820719	*
100-255	324406	Hang-up after power down in multiple cabinet system.	820715	*
100-256	012XX	Extension of Device numbers in prom for DMA-devices.	820722	
100-257 B	324101 322604 324102	Missing 5V connection to R22.	820827	
100-258	322620	Too short set-up time on BIOXE-0 on TRR ECCR-cycles.	820820	*
100-259 B	000XX	Additional decoding because of Megalink.	830215	
100-260	001XX	Changes neccessary because of new controller specifications.	820827	
100-261	019XX	Expansion to include HASP version.	820827	
100-262	322601	Error in Power Fail.	820902	* *
100-263	322602 324106	Several ND-500 error messages due to instructions/data ports running same cycle:	820902	* *
100-264	322619	BIGFUNC gives error in status bit 5 test in systems with long A-cables(daisy chain): due to cable relays: Too long delay from RTZ to ONCYL-0, finishing RTZ too early.	820902	*
100-265 B	324105	a) False DEVREQ. b) CDC FINCH should not have step pulses during RTZ. c) Too short missing clock detection.	820923	*
100-266	322606	TANDBERG-TEST may fail "load point test" responding with "Unit not busy after operation".	820921	*
100-267 B	324105	a)False DEVREQ. b)CDC FINCh should not have step pulses during RTZ. c)Too short missing clock detection.	820923	*
100-268	324105	a)False DEVREQ. b)CDC FINCH should not have step pulses during RTZ. c)Too short missing clock detection.	820910	*
100-269 B	322612	Necessary for "TEST & SET" instruction and for ND-100/CX upgrading	821021	*
100-270	322634	Dummy upgrading of version. (Ref. ECO:100-269).	820910	
100-271	322603	Restart from bus-device failing. Error detected by card-tester.	820910	*
100-272 C	324105	Cardtest requirement.	821213	
100-273	005XX	Change allows greater reentrant segments than 64K in Sintran III(may be introduced by Sintran III version 1).	820910	*
100-274	322603	CPU will not work together with MEMORY MANAGEMENT II(324004).	820921	*
100-275	021XX 022XX	Initial release.	820910	
100-276	322603	Memory out of range.	820921	* *

ECO NO.	PART NO.	Volume-4 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-277	322661	Error in Semaphor Cycle.	820930	
100-276 B	322610	FLOPPY RANDOM fails. Noise on WRAM. Problem seems only to occur when using IC 2148 as RAM.	821014	*
100-279	322633	Dummy upgrading of version. (Ref. ECO:100-278).	820930	
100-280	322669	a)Marginal writing in cache from MPM4. b)Incorrect data read on IOX-cycles. c)Error in Semaphor cycle.	821014	* *
100-281	322612	Continuation of ECO:100-269 revision B. (Necessary for "TEST & SET" instruction and for ND-100/CX upgrading.	821021	*
100-282	322634	Dummy upgrading of version. (Ref. ECO:100-281).	821019	
100-283	322661	Error in ECO:100-277. (Error in semaphor cycle).	821021	
100-284	322605	ND-100 is not reliable after powerfail due to gradually degeneration of DC/DC converter VP5.	821028	* *
100-285	322618	ND-100 is not reliable after powerfail due to gradually degeneration of DC/DC converter VP5.	821028	* *
100-286	322619	Nd-100 is not reliable after powerfail due to gradually degeneration of DC/DC converter VP5.	821028	* *
100-287	324105	Missing RTZ due to marginal timing	821028	*
100-288	324105	Missing RTZ due to marginal timing	821028	*
100-289	322604	Print error.	821110	
100-290	322604	Dummy upgrading of version. (Ref. ECO:100-289).	821110	
100-291	322615	Arrangement drawing error. Can give DEVICE EQUAL for other diveces.	821118	*
100-292	322615	Dummy upgrading of version. (Ref. ECO:100-291).	821118	
100-293	322637	Arrangement drawing error. Can give DEVICE EQUAL FOR other devices. No pass of GRANT.	821118	*
100-294	322626	Read IDENT on BEX goes wrong.	821118	*
100-295	322663	Memory out of range.(Error in ECO:100-276):	821125	*
100-296	322662 324100	a)Error in semaphore cycle if more than one port is active. b)Print error.	821125	*
100-297 C	324001	Upgrading of E-version.	821209	
100-298	322641	Print error.	821202	
100-299	322641	Dummy upgrading of version. (Ref. ECO:100-298).	821202	

ECO NO.	PART NO.	Volume-5 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-300	322029	Fails in test mode on DMA input. Glitch on WCZERO-0.	821202	*
100-301	005XX	SIBAS-500 fails with ND-100/CX and SINTRAN III/H. Error in MOVBW-instruction.	821202	*
100-302	007XX	Floppy bootstrap destroys page-tables when loading stand-alone programs. Fatal for MEMTOF when SINTRAN III has used extended address mode.	821202	* *
100-303	322063	Memory out of range.(Error in ECO:100-276).	821209	* *
100-304 B	324105	ECO:100-287 and 100-100-288 had unexpected: consequences.(Immediate completion of RTZ):	830203	*
100-305	322063	In certain cases BMEM-0 may overload the 13F9 input and damage the circuit 13F.	821209	
100-306	322020	Fatal when using STC formatter with KD card Part No.:433304205/305/405. Incorrect data is transfered during write to tape. This ECO allows the controller to function with all levels of KD card.	821209	*
100-307	322012	Arrangement drawing error. IC's 25H and 26H must be marked with 74LS85 TEXAS. Ref. ECO:100-079 for B and D print.	821215	
100-308	322012	Dummy upgrading of version. (Ref. ECO:100-307).	821215	
100-309	322020	CONFIGURATION INV. does not find devices in B-crate if no memory present.	821215	*
100-310	324105	Cardtest requirement.	821215	
100-311	322024	Error in ECO:100-251.	820103	*
100-312	322009	MPEST failing. Different memory errors is reported.	820103	*
100-313	322003	False interrupts.	820104	*
100-314	322019	Improvement of BAPR-0 shape, especially when the bus is heavy loaded.	820104	
100-315	322005	Improvement of BAPR-0 shape, especially when the bus is heavy loaded.	820104	
100-316	322026	Improvement of BAPR-0 shape, especially when the bus is heavy loaded.	820104	
100-317	322020	Improvement of BAPR-0 shape, especially when the bus is heavy loaded.	820104	
100-318	322027	Due to stringent demands on the Z80-CTC clocksignal, IC 15F (74LS37) is not able to meet these regarding high voltage.	830112	*
100-319 B	322023	Could cause noise when extender-card is installed.	830120	
100-320	322020	Can be fatal when using STC formatter with KD card Part No.:433304204/304. Applies to write in GCR.	830120	* *
100-321	006XX	Fatal errors on DMA-transfer and service request.	830210	* * *
100-322	004XX	Fatal error in DMA-transfer.	830210	* * *
100-323	003XX	6 more Device No. and Ident codes (GPIB 3 - 8). Must be done on systems with more than 2 GPIB - Controllers.	830210	
100-324 B	324105	1)Too small clock pulses for MAR. 2)Occasional snorting of +5V stand by.	830324	

ECO NO.	PART NO.	Volume-5 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-325	324004	1)Missing GND on B-plug. 2)Terminal Aa 30 grounded. 3)Missing capacitor. 4)Design-error in connection with Semaphor Request.	830223	
100-326	322662	Spike on GRANT when many ports installed.	830223	*
100-327	324006	Print and design errors.	830303	
100-328 B	324007	Print and design errors.	830519	
100-329	324008 322663	Page fault at level 3. Write recovery time is too short (below 5 nS) for the re-file (2149).	830303	*
100-330	322623	Memory out of range.	830303	* *
100-331	322615/ 322635	Memory out of range.	830303	* *
100-332	054XX	Expanding ND-500 device numbers to ND500.1,ND500.2,ND500.3,ND500.4,ND500.5.	830303	
100-333	073XX	Change in PIOC address decoding, necessary to run released versions of PIOC software.	830303	* * *
100-334	322661	a)Too hard off termination of XINPUT when long cables. b)Status bit 6 (MOR) might be reset if correctly. c)XAR too short when long cables. d)Increase timeout.	830324	*
100-335	322669	a)Too hard off termination of XINPUT when long cables. b)Status bit 6 (MOR) might be reset if correctly. c)XAR too short when long cables. d)Increase timeout.	830324	*
100-336	324105	Memory out of range.	830310	*
100-337	322604	Memory out of range.	830315	*
100-338	322606	Memory out of range.	830315	*
100-339	322606	Memory out of range.	830315	*
100-340 B	322602	Marginal detection of Powerfail. (Ref. ECO:100-341). If Power Supply of type "Tore Seem S-6003", a Power Fail kit P/N:322991 must be installed	840322	*
100-341 B	322663	Marginal detection of Powerfail. (Ref. ECO:100-340). If Power Supply of type "Tore Seem S-6003", a Power Fail kit P/N:322991 must be installed	840322	*
100-342	324105	DMA channel error(SB11).Glitches on WDC-0.	830324	*
100-343	322604	DMA Channel error(SB11).Glitches on WCZ-0.	830316	*
100-344	322606	DMA Channel error(SB11).Glitches on WCZ-0.	830316	*
100-345	324001	Memory Parity error.	830316	* * *
100-346	324004/ 324107	Cache Test-program gives cache output error. Reason: Too short write-pulse to cache.	830414	* *
100-347 B	322450	Withdrawn. (Ref. ND-Tecn. Tip No.:05).	840322	
100-348 B	324407	Withdrawn. (Ref. ND-Tech. Tip No.:05).	840322	
100-349 B	322663	Withdrawn.	830825	

ECO NO.	PART NO.	Volume-6 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-350 C	324004	1)Trouble with HIT when rewriting in cache levels. 2)Too narrow writepulses to shadow memory. Symptoms: Paging Test gives error message in test 1.	830616	* *
100-351 B	324107	Too many writepulses to shadow memory. Symptoms: Paging test gives error message in Test 1.	830519	* *
100-352	322605 322631	When changing to Riester 0511 DC/DC converter capacitor must be moved due to possibility of short circuit.	830425	*
100-353	322669	Error in Power Fail.	830519	*
100-354	322620	Allows all KD cards(STC Formatter) of Part No.:43304405/305/205 or higher to function during GCR write.	830524	* *
100-355 B	322620	Improvement of BAPR-6 shape, especially when the bus is heavy loaded.(Replacement for ECO:100-175, 306, 317, 320 and 354).	830628	
100-356	322620	Read Backward command does not stack data top to bottom in memory.	830524	* *
100-357	324001	a)Timing problem, data dependent. Spikes on D-1 bus when data=0. b)Logic error, wrong signal at interrupt controller pin23:	830526	* * *
100-358	322603	Some CPUs gives red light and some give page fault. Reason:CLK is too short in low position (below 35nS).	830602	*
100-359 B	322637	Print error.	830913	
100-360 B	324105	Underrun (heavy DMA-load on ND-100 bus) during write to disk, may overwrite next sector. RTZ may give completion at once. This will cause "NOT ON CYLINDER" error in testprograms. (Ref. ECO:100-411).	840202	* *
100-361	324004/ 324107	1)Too small delay on DACYCLE causes false pulses on CDRY. The CPU will behave uncontrolled. 2)Shape up of WCA.	830606	* *
100-362 B	322603	The CPU sometimes generate BMEM without GRANT in a DMA-cycle with memory out of range as result.	830616	* *
100-363 B	324105	Underrun (heavy DMA-load on ND-100 bus) during write to disk, may overwrite next sector. RTZ may give completion at once. This will cause "NOT ON CYLINDER" error in testprograms. (Ref. ECO:100-407).	840202	* *
100-364	324457	Due to noise on ground floppydisks are not working properly. FLOPPY-FORMAT program gives error code 5(CRC-error) when DMA controller.	830822	*
100-365	050XA	a)SINTRAN gives error message when changing format. b)The error messages given by the controller, if an error occures, during "stand alone load", is wrong. These two errors are corrected. In addition the test macros are improved.	830822	*

ECO NO.	PART NO.	Volume-6 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-366	322615	Danger for short circuit.	830707	
	322635			
100-367	322603	Termination on BMINH and XMINH.	830707	
100-368	322602	Changed termination on XMINH.	830707	
	324106			
100-369	322669	Last termination of XMINH. (Require ECO:100-335).	830714	
100-370	322601	Last termination of XMINH. (Require ECO:100-334).	830714	
100-371	324105	Improved over/underrun detection. Clock receiver (75108) may give unsymmetric clock. NOTE: If more than one DMA-device, this ECO must be done.	830816	*
100-372 B	324105	Improved over/underrun detection. Clock receiver (75108) may give unsymmetric clock. NOTE: If more than one DMA-device, this ECO must be done.	830825	*
100-373	322603	The internal clock goes too fast when using delayline PE-26192 (CPU cycletime 129nS) or VALON-DL-2102(132 - 137 nS). NOTE!Check that Revision B of ECO:100-349 is done.	830824	*
100-374	322626	Error in Power Fail.	830824	*
100-375	066XX/ 066XX	BCD-instruction SHDE fails when source is unsigned and destination signed.	830906	*
100-376	322601	Fatal if the N100 BUS CONTROLLER is used in the same crate as the MPM LINE DRIVER with ECO:100-367 implemented.	830831	*
100-377	322669	Fatal if the N100 BUS CONTROLLER is used in the same crate as the MPM LINE DRIVER with ECO:100-367 implemented.	830831	*
100-378	324105	a)Parity check (only), gives address mismatch. b)Arrangement drawing/silkscreen-error.	830914	*
100-379	322603	DMA channel error when used against MPM5 or as BUS MEMORY BRANCHER. (DMA BRANCH from I/O crate to memory).	830928	*
100-380	322603	Pagefaults detected with heavy DMA traffic due to marginal operation of ND-100 bus Arbiter. Marginal timing of EMM-0 signal causing match problems between MMS/ MMS 2 and CPU.	830929	*
100-381	322622	Marginal timing between BD-bus and BDRY-0. Failing in ND-500 test program COMTE.	830919	*
100-382	322603	Design error on EXECUTE-REGISTER instruction.	831005	* * *
100-383	324105	May give address mismatch.	831013	*
100-384	322620	MUX0 and MUX1 are swapped internally to correspond with the STC SLX-0 and SLX-1. Enables correct selection of error MUX bytes.	831019	* *
100-385	322602	Correction of ECO:100-320. Must be done if ECO:100-320 is done.	831019	*
100-386	324106	Dummy upgrading of version. (Ref. ECO:100-385).	831019	

ECO NO.	PART NO.	Volume-b SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-387 B	324001	Protect tabel page is changed from 128 to 512 bytes. BND-b gets pull-up to become PIOC/EXP software compatible.	840315	* *
100-388	064XX	A write to some devices could result in a strange output, due to wrong content in FIFO sequencer Prom.	831027	*
100-389	322661	Change necessary when used with long timeouts and the connected MPM4 has more than 8 ports.	831102	*
100-390	322669	Change necessary when used with long timeouts and the connected MPM4 has more than 8 ports.	831102	*
100-391 C	322613	SINTRAN stops in ERRFATAL on lev.14 with IIC=0.	831214	*
100-392 B	322641	SINTRAN stops in ERRFATAL on lev.14 with IIC=0.	831207	*
100-393 B	322610 322633	SINTRAN stops in ERRFATAL on lev.14 with IIC=0.	831207	*
100-394	324002	The changes are related to bus error detection, I/O device timing and PIOC/EXP compatibility	831207	* *
100-395	322603	Versions incl. level G makes linedriver position dependent,(always last slot in crate). This modification makes linedriver independent of slot-configuration.	840125	
100-396	322629	Testprogram S1172 fails in test 4C. Noise on IMAR.	831228	*
100-397	324006	Problems with ground in pos. 2D and 3D. Wrong polarity used on SDIR on 23C.	831228	
100-398	322619	Controller is reporting status error (bit 7) due to long A-cable.	831214	*
100-399	322627	Resistor R52 not connected to 14D7, due to error in Arrangement drawing.	831228	* *

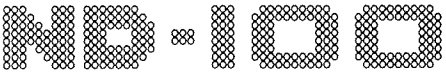
ECO NO.	PART NO.	Volume-7 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-400	322627	Dummy upgrading of version. (Ref. ECO:100-399).	831229	
100-401 B	322667	Necessary changes to obtain interrupt generation and DMA operation according to software specifications.	840202	* *
100-402	324005	SINTRAN stops in ERRFATAL on lev.14 with IIC=0.	840209	*
100-403	007XX	Initiation of memory bank-0 stops when floppy bootstrap program find 0 in memory. Will only cause problems if error in memory bank-0.	840110	*
100-404	322671	Design improvements.	831219	
100-405	324105	Arrangement drawing error.	831228	
100-406	324105	Dummy upgrading of version. (Ref. ECO:100-405).	831229	
100-407	324105	DMA over/underrun will clear BREQ which may give MOR. (New Rev.B of ECO:100-363).	840103	*
100-408	322619	Print error. Missing connection of C14. False setting of SB11.	831214	*
100-409	322619	Dummy upgrading of version. (Ref. ECO:100-408).	831214	
100-410	322619	Noise on signal CONT-1 due to missing groundplane in outer edges (old version of groundplane). Only seen in a batch of cards from "Gylling". NOTE: May give one (or more) word shifted data on disk. No status error.	831214	* * *
100-411	324105	DMA over/underrun will clear BREQ which may give MOR. (New Rev.B of ECO:100-360).	840104	*
100-412	322663	The machine does not work after Power Fail	840110	*
100-413	322626	Due to marginal timing both address and data drivers are enabled at the same time after TRR ECCR. Memory content may be corrupted if memory in I/O crate.	840110	* *
100-414 B	324003	Design errors.	840216	* *
100-415	324004	Missing ground.	840125	* *
100-416	324107	Dummy upgrading of version. (Ref. ECO:100-415).	840125	
100-417	322626	GPIB remote option will fail for device holding the EOI line.	840216	*
100-418	006XX	GPIB system fails.	840307	* *
100-419	324007	SINTRAN stops in ERRFATAL with IIC=0. Error in straps for NTB.	840605	*
100-420	324106	SINTRAN stops in ERRFATAL with IIC=0. Error in straps for NTB.	840605	*
100-421	324003	MASTER incorrectly selected.	840307	
100-422 B	324111	Request incorrect polarity.	841114	
	324116			
100-423	322640	Missing connection Ac32 - Ac 32. (Ref.: Engineering Specification No.:82-074).	840709	*
100-424 B	322615/	Withdrawn.	840823	
	322635			
100-425 B	322623	Withdrawn.	840823	

ECO NO.	PART NO.	Volume-7 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-426	006XX	Changing of pointer from receiver list to transmitter list in HASP communication is not fast enough. Now implemented in hardware microprogram for improved speed. Requires SINTRAN I with SSR No.:67.	840314	* * *
100-427	322619	Double RTZ pulse causes SINTRAN to hang during start up.	840315	*
100-428	322629	Too short setup time on CONT 0-7.	840621	* *
100-429	317XX	Signal timing on MDTACK and CASDIS is changed to avoid problems with some memory cycles getting too short.	840704	* *
100-430 B	324011/ 324119	Initial upgrading of A-version.	841114	
100-431	056XX	Formatting floppydisks take too long time, due to RETVS + problems during write on floppy, when using 8" slimline drives (Toshiba).	840404	*
100-432	324404	Connection on BINT 10 (Ca15) is missing between position 7 and 8. Fatal if I/O device with level 10 interrupt is used in position 7 and 8.	840404	*
100-433	324001	Upgrading of version if Rev. B of ECO:100-387 is done.	840315	* *
100-434	343XX/ 345XX	Hangup or data error while running backup-program WIN45-BACKUP/WIN23.(Streamer).	840709	*
100-435	324006	Print error.	840523	
100-436	322671	Improvements for cardtester.	840522	
100-437	324111	IDENT not passed on.	840523	*
100-438	324004	Too slow RAM packages mounted on some boards.	840521	*
100-439	324107	Too slow RAM packages mounted on some boards.	840521	*
100-440	322663	Too slow RAM packages mounted on some boards. May give different errors under SINTRAN like pagefaults, MOR etc.	840522	*
100-441	322627	Error code 74 (VCO-error) due to error on arrangement drawing and silkscreen. Wrong polarity on Capacitor C8.	840601	*
100-442	324006	Error code 74 (VCO-error) due to error on arrangement drawing and silkscreen. Wrong polarity on Capacitor C8.	840601	*
100-443	322786/ 324478	Noise on interconnection sys between ND100: CPU and MMS on 11 modules cabinets due to missing groundplane.	840710	*
100-444	324008/ 324110	Timing modifications on refresh and ND-100: access in PIOC memory.	840606	* *
100-445 B	322606	Change implemented to run the higher transfer rate requested by Cipher. Frequency of the simulating clock increased to approx. 200 Khz.	840621	*
100-446	322671	Improved stability of Phase Locked Loop.	840604	
100-447	322606	Tandberg mag-tape test failing. After speeding up SRCLK-1, one could get an extra pulse on SRCLK-1 per byte with data error as result.	840523	*

ECO NO.	PART NO.	Volume-7 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-448	324006/ 324110	Due to speed variations in PAL (15H) memory timing is wrong for some accesses. N-100 to PIOC bank addressing is unstable, 4B is changed from 74LS126 to 74F08.	840704	* *
100-449	322b73	New formats do not work.	840704	

ECO NO.	PART NO.	Volume-B SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-450	322674	New formats do not work.	840710	
100-451 B	322610	FLOPPY RANDOM fails. Noise on WRAM. Problem seem only to occur when using IC 2148 as RAM.	840809	*
100-452	322633	Dummy upgrading of version. (Ref. ECO:100-451).	840822	
100-453	324467	Current loop between ND-100 CPU 322663 (3033) and TELEFIX ADAPTER not functioning: Symptom is "dead" console terminal when TELEFIX ADAPTER is installed.	840809	* *
100-454	324004	Marginal writing into cache when reading	840813	*
100-455	322626	WFIFO-B was sometimes not long enough to get the data correct into the FIFO-RAM, due to variations in the RAM specifications.	840813	
100-456	322671	1.False(noise)clear of head register. 2.Adjustment of the PLL. 3.Head select bit: 3. 4.Spikes on BCY-1.	840813	* *
100-457	322674	Incorrect read back of sector address. Control that rev.B of ECO:100-450 is done.	840919	
100-458	322669	To avoid refresh timeout if used as I/O extension. New function of switch 2. Switch 2 up(LD1 not lit): Normal refresh operation. Switch 2 down(LD1 lit): Refresh inhibit.	840822	*
100-459 B	324001	Memory out of range when runnign DMA.	841003	*
100-460	322623	Dummy upgrading of version. Check that ECO:100-425 Rev.B is done.	840822	
100-461	322615/: 322635	Dummy upgrading of version. Check that ECO:100-424 Rev.B is done.	840823	
100-462	349XX	New version of PAL 34902. Phase 1 and 4 too short when format bit B is set.	840822	
100-463 B	322673/: 324110	Hardware load of SINTRAN doesn't work on drives with reallocated sectors. Marginal timing on write disk data.(Rev.ref.B>467)	841203	
100-464	322671	Programmable early & late data strobe. Preceompensation from 10 to 15 nS.	840822	*
100-465 B	322674/: 324117	MD terminated too early.	841024	
100-466 B	324004	Dummy upgrading of version, caused by ECO:100-466.	841206	
100-467	349XX	Sector reallocation for 10MHz drives don't work.	840919	
100-468 B	322674 : 324117	Incorrect read back of sector address.	841204	
100-469 B	322673/: 324110	False SBT.	841204	*
100-470	324101/: 324102/: 322664	Powerfail does not work due to wrong IC's in pos. 5B and 7B on some boards.	841003	*
100-471 B	322674/: 324117	Memory out of range.	841204	*
100-472	322619	Spikes on INT11.	841010	*
100-473 B	322673/: 324110	Hardware load of SINTRAN does not work. (Rev. ref. B>467)	841204	*
100-474	322660	If Power Sequence cable is used Power Fail may not be working.	841023	*

ECO NO.	PART NO.	Volume-B SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
100-475	324014	Wrong polarity for on line/no paper indication if Versatec V80 is used.	841112	
100-476	324116	Octobus pinout change.	841112	
100-477	324014	Marginal writing to memory address register.	841119	
100-478 B	324111/: 324116	Delayed Data Latching to avoid noise which may result in uncontrolled overwriting of memory when paging off. PAGINGTEST and INSTRUCTION test program may fail.	841219	* *
100-479 B	324107	Dummy upgrading of version, caused by ECO:100-466.(H > K Ref. ECO:100-454,466)	841206	
100-480	324014	Print error caused by wrong singal name.	841126	
100-481	363XX	MEMORY test program failing, giving parity error due to memory timing problems. The PIOC-MONITOR giving syncronous exception 2,3 and 11 when running SNA. (Must be done together with ECO:100-482).	841126	*
100-482	324008/: 324110	MEMORY test program failing, giving parity error due to memory timing problems. The PIOC-MONITOR giving syncronous exception 2,3 and 11 when running SNA. (Must be done together with ECO:100-481).	841126	*
100-483	322602	Connection of EXCLK signal to Ac23 to get panel 100341 and 100941 to work.	841210	
100-484	322603	Connection of EXCLK signal to Ac23 to get panel 100341 and 100941 to work.	841210	
100-485	324000/: 324110	MEMORY test program giving "Memory out of range".	841210	*
100-486	322671	Arrangement error.	841210	*
100-487	322673/: 324116	Hardware breakpoint does not work. (New rev. B of ECO:100-483 and 100-473)	841210	*
100-488	324004/: 324107	Cancellation of ECO:100-466 and 100-479. Uncontrolled overwriting of memory on heavy loaded machines with fast CPU due to ECO:100-466 and 100-479.	841210	* *
100-489	322674/: 324117	IC 74LS279 of type RAY used on some 15MHZ SMD Data boards to latch the status-register, do not follow specifications. This may result in destruction of data on diskpacks with reallocated sectors due to wrong content in status-register.	850109	* *
100-490	365XX	SHDE-instruction fails if carryBit is set.: Modification only effects machines running: COBOL,ACCESS,NOTIS-RG or NOTIS CALC.	850109	*
100-491	324012	Destroyed Disketts on SA850 Floppydrives. When Shugart SA850 (8") drives are used the side select signal is sometime driven both from Controller and Floppy.	850123	* *
100-492	324313	To make Disk Switch workable with both 1,7MHz and 15MHz Disk Interface.	850130	
100-493	324495	Layout error.	850130	
100-494	365XX	CPU hangup may cause Panel to hang too.	850130	



PART/PROM/PRINT - NUMBERS CROSS REFERENCE

LIST 1. PART NUMBERS RELATED

LIST 2. PROM NUMBERS RELATED

LIST 3. PRINT NUMBERS RELATED

ISSUED BY: TECHNICAL INFORMATION GROUP

REVISED: 850206

LIST 1. PART NUMBERS RELATED

PART No.	NAME	PRINT	PROM
322450	N100 BACKWIRING	6019	-
322601	MAIN I/O ADAPTER	3001	-
322602	N100 CPU (1. Version)	3002	015XX
			016XX
			017XX
			026XX
			027XX
			028XX
322603	MPM LINE DRIVER	3003	-
322604	10 MB DISK CONTROLLER	3004	012XX
322605	DYNAMIC RAM	3005	-
322606	PERTEC M-T CONTROLLER	3006	012XX
322608	EUROBUS ADAPTER	3008	-
322609	LOCAL I/O BUS	3009	-
322610	FLOPPY AND 4 TERMINALS IF	3010	007XX
			008XX
			009XX
322612	MEMORY MANAGEMENT	3012	011XX
322613	8 TERMINALS INTERFACE	3013	008XX
322615	HDLC + AUTOLOAD	3015	000XX
			001XX
			019XX
			020XX
322618	SMD CONTROL	3018	-
322619	SMD DATA	3019	012XX
322620	STC MAGTAPE CONTROLLER	3020	012XX
			021XX
			022XX
			023XX
322621	BUS EXPANDER (1. Version)	3021	-
322622	N500 INTERFACE	3022	054XX
322623	MEGALINK INTERFACE	3023	000XX
			001XX
			019XX
			020XX
322624	N10 BUS ADAPTER	3024	-
322626	GPIB CONTROLLER	3026	063XX
			064XX
			065XX
			066XX
322627	FLOPPY DISK CONTROLLER	3027	009XX
			056XX
			057XX
			058XX
322628	BUS EXPANDER (2. Version)	3028	-
322629	UNIVERSAL DMA FOR N100	3029	055XX
322631	DYNAMIC RAM - 32 KW	3005	-
322633	4 TERMINALS	3010	008XX
322634	MEMORY MANAGEMENT EXCL. CACHE	3012	011XX
322635	HDLC	3015	000XX
			001XX
			019XX
322637	CERN AUTOLOAD	3015	000XX
			031XX
322640	N-100 EXTENDER CARD	1937	-

LIST 1 (CONT.). PART NUMBERS RELATED

PART No.	NAME	PRINT	PROM
322641	4 TERM. + 4 TERM.IF, NTB	3013	008XX
322650	N100 BACKWIRING (20 POS.)	6027	-
322660	N100 BUS MASTER	3030	-
322661	N100 BUS CONTROLLER (1. Version)	3031	067XX
322662	MEMORY PORT-MPM4 (1. Version)	3032	-
322663	ND-100 CPU (GENERAL VERSION) (2. Version)	3033	015XX 016XX 017XX 026XX 027XX 028XX 052XX 053XX 085XX 086XX
322664	256K-200 ns MEMORY	3034	-
322665	DFS INTERFACE	3035	062XX 068XX 069XX 070XX 071XX
322666	64K RAM	3036	-
322667	ETHERNET CONTROLLER	3037	060XX 061XX 088XX
322669	N100 BUS CONTROLLER (2. Version)	3039	067XX
322670	LOCAL I/O BUS	3040	-
322671	ST-506 DISK CONTROLLER	3041	012XX
322672	2MB MEMORY	3042	-
322673	15MHz SMD CONTROL	3043	349XX
322674	15MHz SMD DATA	3044	012XX 347XX 348XX
322675	RAMTEK 9400 INTERFACE	3045	352XX
322676	VICOM INTERFACE	3046	353XX
322690	PANEL CONTROL 10/M (1. Version)	1946	-
322691	DISPLAY PANEL 10/M	1947	-
322693	PANEL CONTROL N100 (3. Version)	1981	-
322694	CABLE INTERCONNECTION	1985	-
322696	N100 INTERLEAVE	1988	-
322697	WRITEABLE CONTROL STORE (3033 OPTION)	1992	-
322740	WRITABLE CONTROL STORE	1959	-
322761	PROM ADAPTER 1	1950	013XX 018XX 024XX 029XX
322762	REGISTER FILE	1951	-
322763	FLOPPY POWER DISTRIBUTION	1952	-
322765	FLOPPY LINE CONVERTER	1954	-
322767	BUS INTERCONNECTION	1956	-
322768	PROM ADAPTER 2	1957	013XX 014XX 018XX 024XX 025XX 029XX

LIST 1 (CONT.). PART NUMBERS RELATED

PART No.	NAME	PRINT	PROM
322776	BEX ADAPTER	1969	-
322777	BUS TERMINATOR	1970	-
322778	PANEL CONTROL N100 (2. Version)	1964	-
322782	2 WAY INTERLEAVE	1971	-
322783	4 WAY INTERLEAVE	1972	-
322784	8 WAY INTERLEAVE	1973	-
322786	BUS INTER CONNECTION 20 POS.	1974	-
322790	4K PROM ADAPTER	1961	015XX 017XX 026XX 028XX 052XX
322792	10 MB DISK CABLE ADAPTER	1965	-
322793	PERTEC M-T CABLE ADAPTER	1966	-
322986	PERTEC PLUG PANEL	1980	-
322991	KIT S-6003 POWER FAIL	1810	-
324001	PIOC	3101	072XX 073XX 074XX 075XX 087XX
324002	ETHERNET MASTER	3102	073XX 089XX 090XX 091XX 092XX
324003	OCTOBUS IF.	3103	308XX 309XX
324004	MEMORY MANAGEMENT II	3104	011XX
324005	8-TELEX INTERFACE	3105	093XX 094XX
324006	FLOPPY AND STREAMER CONTROLLER	3106	009XX 058XX 343XX 344XX 345XX 346XX
324007	8-TERMINAL INTERFACE	3107	093XX 094XX 095XX
324008	PIOC/256	3108	072XX 073XX 075XX 315XX 316XX 317XX 318XX 319XX 356XX 363XX
324009	OCTOBUS/MPM CHANNEL CONTROLLER	3109	-

LIST 1 (CONT.). PART NUMBERS RELATED

PART No.	NAME	PRINT	PROM
324010	CTI (COLOUR TERMINAL INTERFACE)	3110	367XX 368XX 369XX
324011	8-TERMINAL INTERFACE WITH FIFO	3111	093XX 094XX 095XX 358XX 359XX 360XX 361XX 362XX
324012	8" / 5 1/4" FLOPPY & STREAMER (QIC/02)	3112	009XX 058XX 343XX 344XX 345XX 346XX 357XX
324014	PLOTTER/PRINTER DMA	3114	355XX
324101	256K-150 ns MEMORY	3034	-
324102	128K-150 ns MEMORY	3034	-
324104	FLOPPY DISK CONTR. INCL +12V (Phased out)	3027	009XX 056XX 057XX 058XX
324105	8" DISK CONTROLLER CDC FINCH	3038	012XX
324106	MEMORY PORT-MPM4 (2. Version)	3032	-
324107	MEMORY MANAGEMENT II EXCL. CACHE	3104	011XX
324108	4TERM.+ 4TERM.INTERFACE,NTB	3107	093XX 094XX 095XX
324110	PIOC/64	3108	072XX 073XX 075XX 315XX 317XX 318XX 320XX 321XX 356XX 363XX
324111	MPM LINE DRIVER	3109	-
324113	1 MB MEMORY	3042	-
324116	SINGLE UNIT/15MHz SMD CONTROL	3043	349XX
324117	SINGLE UNIT/15MHz SMD DATA	3044	012XX 347XX 348XX
324313	DUAL CHANNEL	5113	-
324401	MPM4 - 4BANK	6028	-
324402	MPM4 - 4B - A	6029	-
324403	MPM4 - 4B - B	6030	-
324404	MPM4 - 2BANK	6031	-
324405	MPM4 - 1BANK	6032	-
324406	MPM4 - N100	6033	-
324407	ND SATELLITE BACKWIRING	6034	-
324408	MPM4 - 2BANK - DAISY CHAIN	6035	-

LIST 1 (CONT.). PART NUMBERS RELATED

PART No.	NAME	PRINT	PROM
324409	ND COMPACT BACKWIRING	6036	-
324410	ND SATELLITE 84, MOTHERBOARD	6040	-
324451	MASTER BUS DAISY CHAIN - B	1983	-
324452	CABLE TERMINATOR	1984	-
324453	MASTER BUS DAISY CHAIN	1993	-
324455	UNIVERSAL DMA TEST CARD	1995	-
324456	CURRENT LOOP LINK	1996	-
324457	FLOPPY TERMINATION	1997	-
324462	PANEL CONTROL ND SATELLITE (Phased out)	1802	-
324464	PANEL CONTROL ND SATELLITE	1804	-
324465	BUS INTER CONNECTION	1805	-
324467	TELEFIX ADAPTER	1807	-
324469	CONVERT ADAPTER	1809	-
324470	S-6003 POWER FAIL	1810	-
324471	DISK SWITCH PANEL	1811	-
324472	MULTICROSS COPLER PLUG PANEL	1812	-
324473	MULTICROSS COPLER PLINTH PANEL	1813	-
324475	PANEL CONTROL / TELEFIX ADAPTER	1815	365XX
324476	300MB PLUGPANEL	1816	-
324477	TRACKER BALL ADAPTER	1817	-
324478	BUS INTER CONNECTION 20 POS. N100	1818	-
324479	PANEL CONTROL N100 COMPACT	1819	-
324480	DC-DISTRIBUTION	1820	-
324482	DISK SWITCH PLUG PANEL	1822	-
324483	ND-100 COMPACT BUS INTER CONNECTION	1823	-
324493	VICOM CABLE ADAPTER	1833	-
324494	PANEL CONTROL	1834	365XX
324495	TELEFIX DRIVER	1835	-

LIST 2. PROM NUMBERS RELATED

PROM	NAME	PRINT	PART
000XX	CONTROL SIGNAL DECODING	3015	322615
		3015	322635
		3015	322637
		3023	322623
001XX	HDLC DMA CONTROL	3015	322615
		3015	322635
		3023	322623
006XX	HDLC HASP CONTROL (Phased out for ND-100)	3015	322615
		3015	322635
007XX	FLOPPY BOOTSTRAP	3010	322610
008XX	TERMINAL DEVNO	3010	322610
		3010	322633
		3013	322613
		3013	322641
009XX	FLOPPY DEVNO	3010	322610
		3027	322627
		3027	324104
		3106	324006
		3112	324012
011XX	N100 DISPLAY PANEL	3012	322612
		3012	322634
		3104	324004
		3104	324107
012XX	MASS STORAGE DEVNO	3004	322604
		3006	322606
		3019	322619
		3020	322620
		3038	324105
		3041	322671
		3044	322674
		3044	324117
013XX	N100-MICROP-1K	1950	322761
		1957	322768
014XX	N100-MAP-1K	1957	322768
015XX	N100-MICROP-2K	3002	322602
		3033	322663
016XX	N100-MAP-2K	3002	322602
		3033	322663
017XX	N100-S-2K	3002	322602
		3033	322663
018XX	N100-S-1K	1950	322761
		1957	322768
019XX	N100-HDLC-DEVNO	3015	322615
		3015	322635
		3023	322623
020XX	N100-HDLC-AUTOLOAD BOOTSTRAP	3015	322615
		3023	322623
021XX	N100-BUS-CONTROL	3020	322620
022XX	FIFO-CONTROL	3020	322620
023XX	COMMAND-DEC. FOR MODE CONTR.	3020	322620
024XX	N100-F32-PR-1K	1950	322761
		1957	322768
025XX	N100-F32-MAP-1K	1957	322768
026XX	N100-F32-PR-2K	3002	322602
		1961	322790
		3033	322663

LIST 2 (CONT.). PROM NUMBERS RELATED

PROM	NAME	PRINT	PART
027XX	N100-F32-MAP-2K	3002	322602
		3033	322663
028XX	N100-F32-S-2K	3002	322602
		3033	322663
029XX	N100-F32-S-1K	1950	322761
		1957	322768
031XX	CERN AUTLOAD	3015	322637
052XX	N100-COMMERCIAL-MICROPROGRAM	1961	322790
		3033	322663
053XX	N100-MAP-4K	3002	322602
		3033	322663
054XX	N500-INTERFACE	3022	322622
055XX	N100 UNIVERSAL DMA	3029	322629
056XX	FLOPPY MICROPROG	3027	322627
		3027	324104
057XX	BUS SEQUENCER	3027	322627
058XX	DEV.DECOD.UPPER	3027	322627
		3027	324104
		3106	324006
		3112	324012
060XX	ETHERNET R-LOGIC	3037	322667
061XX	ETHERNET C-LOGIC	3037	322667
062XX	DFS INTERFACE	3035	322665
063XX	GPIB-DEVICE NO.	3026	322626
064XX	GPIB-FIFO SEQUENC.	3026	322626
065XX	GPIB-N100 SEQUENC.	3026	322626
066XX	GPIB-MICRO-PROG.	3026	322626
067XX	BUSC DEVICE NO.	3031	322661
067XX	BUSC DEVICE NO.	3039	322669
068XX	MICRO PROGRAM	3035	322665
069XX	ERROR CHECK	3035	322665
070XX	TEST PROM	3035	322665
071XX	REGISTER SELECT	3035	322665
072XX	PIOC DEVICE NUMBERS	3101	324001
		3108	324008
			324110
073XX	PIOC ADDRESS DECODING	3101	324001
		3102	324002
		3108	324008
			324110
074XX	PIOC BUS-CONTROL DECODING	3101	324001
075XX	PIOC	3101	324001
		3108	324008
			324110
085XX	N100 COMMERCIAL-CX-MICRO-PROG.	3033	322663
086XX	N100-CX-MAP-4K	3033	322663
087XX	PIOC PROTECT LOGIC	3101	324001
088XX	ETHERNET FRAME-LOG	3037	322667
089XX	ETHERNET	3102	324002
090XX	ETHERNET	3102	324002
091XX	ETHERNET	3102	324002
092XX	ETHERNET PROT. LOG.	3102	324002
093XX	TERMINAL DEVICE NUMBER	3105	324005
		3107	324007
		3107	324108
		3111	324011

LIST 2 (CONT.). PROM NUMBERS RELATED

PROM	NAME	PRINT	PART
094XX	TERMINAL DEVICE NUMBER	3105	324005
		3107	324007
		3107	324108
		3111	324011
095XX	TERMINAL CONTROL SIGNAL	3107	324007
		3107	324108
		3111	324011
308XX	OCTO MATCH	3103	324003
309XX	OCTO TIMING	3103	324003
315XX	XDOWN-LOGIC	3108	324008
			324110
316XX	BANK-SELECT-256	3108	324008
317XX	PIOC-MEM-CONTROL	3108	324008
			324110
318XX	PIOC-INT-ACK	3108	324008
			324110
319XX	PIOC-256-HIGH-ADDR.	3108	324008
320XX	PIOC-64-HIGH-ADDR.	3108	324110
321XX	BANK-SELECT-64	3108	324110
343XX	FLOPPY + STREAMER uPROGRAM	3106	324006
		3112	324012
344XX	MEMORY ADDRESS DECODING	3106	324006
		3112	324012
345XX	BYTE WORD CONVERTER	3106	324006
		3112	324012
346XX	STREAMER CONTROLLER	3106	324006
		3112	324012
347XX	SMD FIFO	3044	322674
		3044	324117
348XX	DEVICE DECODE UPPER	3044	322674
		3044	324117
349XX	SMD FORMAT	3043	322673
		3043	324116
352XX	DEV.NO. & IDENT	3045	322675
353XX	DEV.NO. & IDENT	3046	322676
354XX	HDLC HASP ND-100 (2. Version)	3015	322615
		3015	322635
355XX	DEV.NO. & IDENT	3114	324014
356XX	PIOC PROTECT LOG	3108	324008
357XX	WRITE PRECOMP	3112	324012
358XX	BUS CONTROL	3111	324011
359XX	FIFO RESET	3111	324011
360XX	IO CYCLE CONTR.	3111	324011
361XX	FIFO CONTROL	3111	324011
362XX	DTR & FLOW CONTR.	3111	324011
363XX	PIOC-DRAM-CONTROL	3108	324008
365XX	PANEL MICROCODE	1815	324475
		1834	344494
367XX	DEV. NO. & IDENT	3110	324010
368XX	ERROR CODES	3110	324010
369XX	CTI TIMING	3110	324010

LIST 3. PRINT NUMBERS RELATED

PRINT	NAME	PART No.	PROM
1802	PANEL CONTROL ND SATELLITE (Phased out)	324462	-
1804	PANEL CONTROL ND SATELLITE	324464	-
1805	BUS INTER CONNECTION	324465	-
1806	STANDARD DISK PLUG PANEL	324466	-
1807	TELEFIX ADAPTER	324467	-
1809	CONVERT ADAPTER	324469	-
1810	KIT S-6003 POWER FAIL	322991	-
1810	S-6003 POWER FAIL	324470	-
1812	MULTICROSS COPLER PLUG PANEL	324472	-
1815	PANEL CONTROL / TELEFIX ADAPTER	324475	365XX
1816	300MB PLUGPANEL	324476	-
1817	TRACKER BALL ADAPTER	324477	-
1818	BUS INTER CONNECTION 29 POS. N100	324478	-
1819	PANEL CONTROL N100 COMPACT	324479	-
1820	DC-DISTRIBUTION	324480	-
1822	DISK SWITCH PLUG PANEL	324482	-
1823	ND 100 COMPACT BUS INTER CONNECTION	324483	-
1833	VICOM CABLE ADAPTER	324493	-
1834	PANEL CONTROL	324494	365XX
1835	TELEFIX DRIVER	324495	-
1937	N-100 EXTENDER CARD	322640	-
1946	PANEL CONTROL 10/M (1. Version)	322690	-
1947	DISPLAY PANEL 10/M	322691	-
1950	PROM ADAPTER 1	322761	013XX 018XX 024XX 029XX
1951	RF ADAPTER 1	322762	-
1952	FLOPPY POWER DISTRIBUTION	322763	-
1954	FLOPPY LINE CONVERTER	322765	-
1956	BUS INTERCONNECTION	322767	-
1957	PROM ADAPTER 2	322768	013XX 014XX 018XX 024XX 025XX 029XX
1959	WRITABLE CONTROL STORE	322740	-
1961	4K PROM ADAPTER	322790	015XX 017XX 026XX 028XX 052XX
1964	PANEL CONTROL N100 (2. Version)	322778	-
1965	10 MB DISK CABLE ADAPTER	322792	-
1966	PERTEC M-T CABLE ADAPTER	322793	-
1969	BEX ADAPTER	322776	-
1970	BUS TERMINATOR	322777	-
1971	2 WAY INTERLEAVE	322782	-
1972	4 WAY INTERLEAVE	322783	-
1973	8 WAY INTERLEAVE	322784	-
1974	BUS INTER CONNECTION 20 POS.	322786	-
1980	PERTEC PLUG PANEL	322986	-
1981	PANEL CONTROL N-100 (3. Version)	322693	-
1983	MASTER BUS DAISY CHAIN - B	324451	-
1984	CABLE TERMINATOR	324452	-

LIST 3 (CONT.). PRINT NUMBERS RELATED

PRINT	NAME	PART No.	PROM
1985	CABLE INTERCONNECTION	322694	-
1988	N100 INTERLEAVE	322696	-
1992	WRITEABLE CONTROL STORE (3033 OPTION)	322697	-
1993	MASTER BUS DAISY CHAIN	324453	-
1994	DISK PLUG PANEL	324454	-
1995	UNIVERSAL DMA TEST CARD	324455	-
1996	CURRENT LOOP LINK	324456	-
1997	FLOPPY TERMINATION	324457	-
3001	MAIN I/O ADAPTER	322601	-
3002	N100 CPU (1. Version)	322602	015XX
			016XX
			017XX
			026XX
			027XX
			028XX
3003	MPM LINE DRIVER	322603	-
3004	10 MB DISK CONTROLLER	322604	012XX
3005	DYNAMIC RAM	322605	-
		322631	-
3006	PERTEC M-T CONTROLLER	322606	012XX
3008	EUROBUS ADAPTER	322608	-
3009	LOCAL I/O BUS	322609	-
3010	FLOPPY AND 4 TERMINALS IF	322610	007XX
			008XX
			009XX
3010	4 TERMINALS	322633	008XX
3012	MEMORY MANAGEMENT	322612	011XX
3012	MEMORY MANAGEMENT EXCL. CACHE	322634	011XX
3013	8 TERMINALS INTERFACE	322613	008XX
3013	4 TERM. + 4 TERM.IF, NTB	322641	008XX
3015	HDLC + AUTOLOAD	322615	000XX
			001XX
			019XX
			020XX
3015	HDLC	322635	000XX
			001XX
			019XX
3015	CERN AUTOLOAD	322637	000XX
			031XX
3018	SMD CONTROL	322618	-
3019	SMD DATA	322619	012XX
3020	STC MAGTAPE CONTROLLER	322620	012XX
			021XX
			022XX
			023XX
3021	BUS EXPANDER (1. Version)	322621	-
3022	N500 INTERFACE	322622	054XX
3023	MEGALINK INTERFACE	322623	000XX
			001XX
			019XX
			020XX
3024	N10 BUS ADAPTER	322624	-
3026	GPIB CONTROLLER	322626	063XX
			064XX
			065XX
			066XX

LIST 3 (CONT.). PRINT NUMBERS RELATED

PRINT	NAME	PART No.	PROM
3027	FLOPPY DISK CONTROLLER	322627	009XX 056XX 057XX 058XX
3027	FLOPPY DISK CONTR. INCL +12V (Phased out)	324104	009XX 056XX 057XX 058XX
3028	BUS EXPANDER (2. Version)	322628	-
3029	UNIVERSAL DMA FOR N100	322629	055XX
3030	N100 BUS MASTER	322660	-
3031	N100 BUS CONTROLLER (1. Version)	322661	067XX
3032	MEMORY PORT-MPM4 (1. Version)	322662	-
3032	MEMORY PORT-MPM4 (2. Version)	324106	-
3033	ND-100 CPU (GENERAL VERSION) (2. Version)	322663	015XX 016XX 017XX 026XX 027XX 028XX 052XX 053XX 085XX 086XX
3034	256K-200 ns MEMORY	322664	-
3034	256K-150 ns MEMORY	324101	-
3034	128K-150 ns MEMORY	324102	-
3035	DFS INTERFACE	322665	062XX 068XX 069XX 070XX 071XX
3036	64K RAM	322666	-
3037	ETHERNET CONTROLLER	322667	060XX 061XX 088XX
3038	8" DISK CONTROLLER CDC FINCH	324105	012XX
3039	N100 BUS CONTROLLER (2. Version)	322669	067XX
3040	LOCAL I/O BUS	322670	-
3041	ST-506 DISK CONTROLLER	322671	012XX
3042	2MB MEMORY	322672	-
3042	1MB MEMORY	324113	-
3043	15 MHz SMD CONTROL	322673	349XX
3043	SINGLE UNIT/15 MHz SMD CONTROL	322673	349XX
3044	15MHz SMD DATA	322674	012XX 347XX 348XX
3044	SINGLE UNIT/15MHz SMD DATA	322674	012XX 347XX 348XX
3045	RAMTEK 9400 INTERFACE	322675	352XX
3046	VICOM INTERFACE	322676	353XX

LIST 3 (CONT.). PRINT NUMBERS RELATED

PRINT	NAME	PART No.	PROM
3101	PIOC	324001	072XX 073XX 074XX 075XX 087XX
3102	ETHERNET MASTER	324002	073XX 089XX 090XX 091XX 092XX
3103	OCTOBUS IF.	324003	308XX 309XX
3104	MEMORY MANAGEMENT II	324004	011XX
3104	MEMORY MANAGEMENT II EXCL. CACHE	324107	011XX
3105	8-TELEX INTERFACE	324005	093XX 094XX
3106	FLOPPY AND STREAMER CONTROLLER	324006	009XX 058XX 343XX 344XX 345XX 346XX
3107	8-TERMINAL INTERFACE	324007	093XX 094XX 095XX
3107	4TERM.+ 4TERM.INTERFACE,NTB	324108	093XX 094XX 095XX
3108	PIOC/256	324008	072XX 073XX 075XX 315XX 316XX 317XX 318XX 319XX 356XX 363XX
3108	PIOC/64	324110	072XX 073XX 075XX 087XX 315XX 317XX 318XX 320XX 321XX 363XX
3109	OCTOBUS/MPM CHANNEL CONTROLLER	324009	-
3109	MPM LINE DRIVER	324111	-
3110	CTI (COLOUR TERMINAL INTERFACE)	324010	-

LIST 3 (CONT.). PRINT NUMBERS RELATED

PRINT	NAME	PART No.	PROM
3111	8-TERMINAL INTERFACE WITH FIFO	324011	093XX 094XX 095XX 358XX 359XX 360XX 361XX 362XX
3112	8" / 5 1/4" FLOPPY & STREAMER (QIC/02)	324012	009XX 058XX 343XX 344XX 345XX 346XX 357XX
3114	PLOTTER/PRINTER DMA	324014	355XX
5113	DUAL CHANNEL	324313	-
6019	N10/M BACKWIRING	322450	-
6027	N100 BACKWIRING (20 POS.)	322650	-
6028	MPM4 - 4BANK	324401	-
6029	MPM4 - 4B - A	324402	-
6030	MPM4 - 4B - B	324403	-
6031	MPM4 - 2BANK	324404	-
6032	MPM4 - 1BANK	324405	-
6033	MPM4 - N100	324406	-
6034	ND SATTELITE BACKWIRING	324407	-
6035	MPM4 - 2BANK - DAISY CHAIN	324408	-
6036	ND COMPACT BACKWIRING	324409	-
6040	ND SATELLITE 84, MOTHERBOARD	324410	-

TABLE OF CONTENTS

TERMINAL DEVICE NUMBERS 32 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
00800	*																							
ECO 100																								

*: 4H, 5H

III-5-6-13

ID NO
322613
322641

ND-100
MICROPROGRAM REGISTRATION
SHEET
3013

BW 14.05.82

NORSK DATA A.S

HDLCD 32 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
00000	5E	B																						
00001	6E	A																						
ECO 100		257 Pos6																						

Valid for 322615, 322635, 322637 and 324112

* HDLCC 512 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
00100	21E	XXX	C																					
00101	19E	XXX	C																					
00102	16E	XXX	C																					
00103	18E	XXX	C																					
00110	22E	XXX	C																					
00111	23E	XXX	C																					
00112	20E	XXX	C																					
00113	17E	XXX	C																					
ECO 100			260																					

Valid for 322615, 322635

* HASP 512 × 8 PROM

NOTE! OLD PROM NO 006XX ONLY VALID FOR N-10

A	A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
15400	[illegible]	21E																							
15401	[illegible]	5E																							
15402	[illegible]	16E																							
15403	[illegible]	18E																							
15404	[illegible]	22E																							
15405	[illegible]	23E																							
15406	[illegible]	20E																							
15407	[illegible]	17E																							
ECO 100	ECO 260																								

Valid for 322615, 322635 324112

N 100 HDLC DEV NUMBER & IDENT NUMBER 32 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
01300	30	B																						
ECO 100		257																						

Valid for 322615, 322635 324112

N 100 HDLC AUTOLOAD BOOTSTRAP 512 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
02000	7G																							
ECO 100																								

Valid for 322615

CERN AUTOLOAD 512 × 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
03100	7G																							
ECO 100																								

Valid for 322637

* HDLC DMA : PROM NO 001XX
HDLC HASP : PROM NO 006XX

ECO NO 322615 322635 322637 324112

ND 100 PROGRAM REGISTRATION SHEET

3015 Page 1 of 1

NORSK DATA A.S
Oslo, Norway

10MB DISK 32 x 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
01200	80	8																						
[illegible]		256																						

III-6-6-15

ID NO
322619

70-100 MICROPROGRAM REGISTRATION SHEET	3019
NORSK DATA A.S	

BW 1405 82

10 MB DISK 32 × 8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
01200	70	B																						
ECO 100-		256																						

STC MAGTAPE CONTROLLER 256 × 24 + 32 × 8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
02101	1H	XXX	XXX	XXX	E																			
02102	2H	XXX	XXX	XXX	B																			
02103	3H	XXX	XXX	XXX	C																			
02104	4E	XXX	XXX	XXX	C																			
ECO 100-					275																			

STC MAGTAPE CONTROLLER 512 × 8 + 256 × 16 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
02201	228	XXX	XXX	0																				
02202	220	XXX	XXX	A																				
02203	230	XXX	XXX	A																				
ECO 100-				275																				

STC MAGTAPE CONTROLLER 32 × 8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
02300	14C																							

ID NO 322620

ND-100
MICROPROGRAM REGISTRATION SHEET

3020

Drawn BW 210582

NORSK … A A.S
Oslo, Norway

N500 INTERFACE 32 * 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
05400	14F																							
[illegible]																								

III-6-9-14

ID NO
322622

ND-100
MICROPROGRAM REGISTRATION
SHEET
3022

BW 2105 82

NORSK DATA A.S

HOLCD 32 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 0 0 0 0	5E	B																						
0 0 0 0 1	6E	B																						
ECO NO:		259																						

HOLCC 512 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 0 1 0 0	21E	XXX	C																					
0 0 1 0 1	19E	XXX	C																					
0 0 1 0 2	15E	XXX	C																					
0 0 1 0 3	18E	XXX	C																					
0 0 1 1 0	22E	XXX	C																					
0 0 1 1 1	23E	XXX	C																					
0 0 1 1 2	20E	XXX	C																					
0 0 1 1 3	17E	XXX	C																					
ECO NO:			260																					

M100 HOLC DEV. NUMBER & IDENT NUMBER 32 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 1 9 0 0	36	B																						
ECO NO:		261																						

M100 HOLC AUTOLOAD BOOTSTRAP 512 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 2 0 0 0	7E																							
ECO NO:																								

III-6-9-18

ID NO
322623

ND 100
MICROPROGRAM REGISTRATION
SHEET
3023

Drawing BW. 2105.82

NORSK [illegible] A.S
Oslo Norway

GPI[illegible]VICE NO 32 × 8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 5 3 0 0	13F	B																						
ECO 100 ·		323																						

GPIB · FIFO SEQUENCER 256 × 8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 5 4 0 0	15H	A	C																					
0 5 4 0 1	14H	B	C																					
ECO 100 ·		322	388																					

GPIB · N100 SEQUENCER 256 × 8 (32 × 8) PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 6 5 0 0	100																							
0 6 5 0 1	120																							
0 6 5 0 2	130																							
0 6 5 0 3	140																							
ECO 100 ·																								

GPIB · MICRO PROGRAM 2K × 8 EPROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 6 6 0 0	23G	XXX	XXX	XXX	XXX	XXX	XXX	H	J															
0 6 6 0 1	25G	XXX	XXX	XXX	XXX	XXX	XXX	H	J															
0 6 6 0 2	27G	XXX	XXX	XXX	XXX	XXX	XXX	H	J															
ECO 100 ·								321	418															

ID NO 322626

ECO 100 418

Corrected | Date | Sign

ND-100
MICROPROGRAM REGISTRATION SHEET

Scale: 3026 | Drawn BW 28.05.82 | Contr | Appr

Replacement for

NORSK DATA A.S
Oslo, Norway

Replaced by

DEVICE NO BIT (0-7) 32 * 8 PROM

A	POS	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
00900	9C																							
ECO 100-																								

MICRO-PROSESSOR-PROGRAM 2048 * 8 EPROM

A	POS	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
05600	17G	B	C	0																				
05601	15G	B	C	0																				
05602	13G	B	C	0																				
ECO 100-		239	365	431																				

BYTE SEQUENCER-PAL PAL10L8

A	POS	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
05700	10E																							
ECO 100-																								

DEVICE NO BIT 8-15 32 * 8 PROM

A	POS	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
05800	6C																							
ECO 100-																								

ND-100
MICROPROGRAM REGISTRATION
SHEET

3027

322627

NORSK DATA A.S
Oslo, Norway

N100 UNIVERSAL DMA 32 × 8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
05500	10E																							
05501	11E																							
ECO 100-																								

ID NO 322629

Corrected | Date | Sign

ND-100
MICROPROGRAM REGISTRATION
SHEET

Scale 3029

Drawn BW 21.05.82
Contr
Appr
Replacement for
Replaced by

NORSK DATA A.S
Oslo, Norway

BUSC DEVICE NO 256 x 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
06700	100																							
Fuse																								

STANDARD N-100 µP (2K x 4 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
02600	200	A	C	D	E	E	G	G	—	K	K	M	N											
02601	190	A	C	D	E	E	G	G	—	K	K	M	N											
02602	180	A	C	D	E	E	G	G	—	G	G	M	N											
02603	170	B	B	D	E	E	G	H	—	M	M	M	M											
02604	160	B	C	D	E	E	G	G	—	K	K	M	M											
02605	150	A	C	D	E	E	G	G	—	G	G	M	M											
02606	140	A	C	D	D	D	G	G	—	K	K	M	M											
02607	130	A	A	D	D	D	G	G	—	G	G	M	M											
02608	120	A	A	A	A	A	G	G	—	G	G	M	M											
02609	110	A	A	D	D	D	G	G	—	G	G	M	M											
02610	100	A	A	D	D	D	G	G	—	G	G	M	M											
02611	90	A	A	A	A	A	G	G	—	G	G	M	M											
02612	80	A	A	A	A	A	G	G	—	G	G	M	M											
02613	70	A	A	D	D	D	G	G	—	K	K	M	M											
02614	60	A	C	D	D	D	G	G	—	G	G	M	M											
02615	50	A	C	D	E	E	G	G	—	K	K	M	M											
02700	208	A	A	A	A	A	G	G	—	G	G	M	N											
02701	198	A	A	A	A	A	G	G	—	G	G	M	N											
02702	188	A	A	A	A	A	G	G	—	G	G	M	N											
ECO 100-		69	70	71	72	78	96	112	—	124	125	161	162											

STANDARD VERSION - 32BIT

ND 32256.3

ND-100
MICROPROGRAM REGISTRATION
SHEET
MICROPROGRAM AND MAP

3033

Rev. 20 (4.82)

Page 1 of 5

NORSK DATA A.S

STANDARD N-100 µP (2K × 4PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
01500	200	B	C	D	E	F	F	H	J	K	—	M	N	P										
01501	19D	A	C	D	E	F	F	H	H	K	—	M	N	P										
01502	18D	A	C	D	C	D	D	H	H	K	—	M	N	P										
01503	17D	A	C	D	C	D	G	H	H	K	—	M	N	N										
01504	16D	A	C	D	C	D	G	H	H	K	—	M	N	N										
01505	15D	B	C	D	C	D	D	H	H	K	—	M	N	N										
01506	14D	A	A	D	A	D	D	H	H	K	—	M	N	N										
01507	13D	B	C	D	C	D	D	H	H	K	—	M	N	N										
01508	12D	A	C	D	C	D	D	D	D	K	—	M	N	N										
01509	11D	A	C	D	C	D	D	H	H	K	—	M	N	N										
01510	10D	A	A	D	A	D	D	H	H	K	—	M	N	N										
01511	9D	A	A	D	A	D	D	D	D	K	—	M	N	N										
01512	8D	A	A	D	A	D	D	D	D	K	—	M	N	N										
01513	7D	A	C	D	C	D	D	H	H	K	—	M	N	N										
01514	6D	A	C	D	C	D	D	H	H	K	—	M	N	N										
01515	5D	A	C	D	C	D	D	H	H	K	—	M	N	N										
01600	20B	A	A	D	A	D	D	D	D	K	—	M	N	N										
01601	19B	A	A	D	A	D	D	D	D	K	—	M	N	N										
01602	18B	A	A	D	A	D	D	D	D	K	—	M	N	N										
ECO 100-		30	31	47	67	68	69	71	78	96	—	157	158	159										

STANDARD VERSION - 48BIT

ID NO 322663

ENG. SPEC. 83-065	18.11.83	Final
Corrected	Date	Sign

ND-100 MICROPROGRAM REGISTRATION SHEET MICROPROGRAM AND MAP

Scale | Drawn BW 23.08.83 | Check | 3033 | Page 2 of 6 | Replacement for

NORSK DATA A.S Oslo, Norway

Replaced by

N-100/S µP (2K × 4 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
02600	200	A	C	D	E	F	G	G	G	K	K	M	N											
02601	190	A	C	D	E	E	G	G	G	K	K	M	N											
02602	180	A	C	D	E	E	G	G	G	G	G	M	N											
02603	170	B	B	D	E	E	G	H	H	H	H	M	M											
02604	160	B	C	D	E	E	G	G	G	K	K	M	M											
02805	150	A	C	D	E	E	G	G	J	J	J	M	M											
02606	140	A	C	D	D	D	G	G	G	K	L	M	M											
02607	130	A	A	D	D	D	G	G	G	G	G	M	M											
02608	120	A	A	A	A	A	G	G	G	G	G	M	M											
02609	110	A	A	D	D	D	G	G	G	G	G	M	M											
02610	100	A	A	D	D	D	G	G	G	G	G	M	M											
02611	90	A	A	A	A	A	G	G	G	G	G	M	M											
02612	80	A	A	A	A	A	G	G	G	G	G	M	M											
02613	70	A	A	D	D	D	G	G	G	K	K	M	M											
02614	60	A	C	D	D	D	G	G	G	G	G	M	M											
02615	50	A	C	D	E	E	G	G	G	K	K	M	M											
02700	208	A	A	A	A	A	G	G	G	G	G	M	M											
02701	198	A	A	A	A	A	G	G	G	G	G	M	M											
02702	188	A	A	A	A	A	G	G	G	G	G	M	M											
ECO 100-		69	70	71	72	78	96	112	113	124	125	161	162											

FAST VERSION - 32 BIT

ID NO 322663

Corrected | Date | Sig

ND-100
MICROPROGRAM REGISTRATION SHEET
MICROPROGRAM AND MAP

Scale: 3033 | Drawn BW | 20.08.82 | Contr. | Page 3 of 6

Replacement for | Replaced by

NORSK DATA A.S
Oslo, Norway

N-100/S μP (2K x 4 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
01500	200	B	C	D	E	F	F	H	J	K	K	M	N	P										
01501	190	A	C	D	E	F	F	H	H	K	K	M	N	P										
01502	180	A	C	D	C	D	D	H	H	K	K	M	N	P										
01503	170	A	C	D	C	D	G	H	H	K	K	M	N	N										
01504	160	A	C	D	C	D	G	H	H	K	K	M	N	N										
01705	150	B	C	D	C	D	D	H	H	K	L	M	N	N										
01506	140	A	A	D	A	D	D	H	H	K	K	M	N	N										
01507	130	B	C	D	C	D	D	H	H	K	K	M	N	N										
01508	120	A	C	D	C	D	D	D	D	K	K	M	N	N										
01509	110	A	C	D	C	D	D	H	H	K	K	M	N	N										
01510	100	A	A	D	A	D	D	H	H	K	K	M	N	N										
01511	90	A	A	D	A	D	D	D	D	K	K	M	N	N										
01512	80	A	A	D	A	D	D	D	D	K	K	M	N	N										
01513	70	A	C	D	C	D	D	H	H	K	K	M	N	N										
01514	60	A	C	D	C	D	D	H	H	K	K	M	N	N										
01515	50	A	C	D	C	D	D	H	H	K	K	M	N	N										
01600	208	A	A	D	A	D	D	D	D	K	K	M	N	N										
01501	198	A	A	D	A	D	D	D	D	K	K	M	N	N										
01603	188	A	A	D	A	D	D	D	D	K	K	M	N	N										
ECO 100-		30	31	47	67	68	69	71	78	96	113	157	158	159										

FAST VERSION · 48BIT

ID NO 322663

Corrected | Date | Sign

ND-100 MICROPROGRAM REGISTRATION SHEET MICROPROGRAM AND MAP

Drawn BW 23.08.82

3033

NORSH[redacted] A.S
Oslo [redacted]ay

N 100/S µP (2K + 4PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
02500	200	A	C	D	E	F	G	G	G	K	K	M	N											
02501	190	A	C	D	E	E	G	G	G	K	K	M	N											
02502	180	A	C	D	E	E	G	G	G	G	G	M	N											
02503	170	B	B	D	E	E	G	H	H	H	H	M	M											
02504	160	B	C	D	E	E	G	G	G	K	K	M	M											
02505	150	A	C	D	E	E	G	G	J	J	J	M	M											
02506	140	A	C	D	D	D	G	G	G	K	L	M	M											
02507	130	A	A	D	D	D	G	G	G	G	G	M	M											
02508	120	A	A	A	A	A	G	G	G	G	G	M	M											
02509	110	A	A	D	D	D	G	G	G	G	G	M	M											
02510	100	A	A	D	D	D	G	G	G	G	G	M	M											
02511	90	A	A	A	A	A	G	G	G	G	G	M	M											
02512	80	A	A	A	A	A	G	G	G	G	G	M	M											
02513	70	A	A	D	D	D	G	G	G	K	K	M	M											
02514	60	A	C	D	D	D	G	G	G	G	G	M	M											
02515	50	A	C	D	E	E	G	G	G	K	K	M	M											
ECO 100		69	70	71	72	78	96	112	113	124	125	161	162											

N 100/S µP (2K + 4PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
08500	200	A	A	D	D																			
08501	190	A	A	D	D																			
08502	180	A	C	D	D																			
08503	170	B	B	D	D																			
08504	160	A	A	D	D																			
08505	150	A	C	D	D																			
08506	140	A	C	D	D																			
08507	130	A	C	D	D																			
08508	120	A	A	D	D																			
08509	110	A	C	D	D																			
08510	100	A	A	D	D																			
08511	90	A	A	D	D																			
08512	80	A	A	D	D																			
08513	70	A	A	D	E																			
08514	60	B	B	D	E																			
08515	50	A	C	D	E																			
08500	208	A	A	D	D																			
08501	198	A	A	D	D																			
08502	188	A	A	D	D																			
ECO 100		273	301	375	490																			

Note

Can not be used on 322602

COMMERCIAL EXTENDED CX 32BIT

322653

ECO 100-490 | 15.01.85 | HEBR

ND-100/CX
MICROPROGRAM REGISTRATION SHEET
MICROPROGRAM AND MAP

3033 | Page 5 of 5

NORSK DATA A.S
Oslo, Norway

N-100/S µP (2K • 4PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
01500	200	B	C	D	E	F	F	H	J	K	K	M	N	P										
01501	190	A	C	D	E	F	F	H	H	K	K	M	N	P										
01502	180	A	C	D	C	D	D	H	H	K	K	M	N	P										
01503	170	A	C	D	C	D	G	H	H	K	K	M	N	P										
01504	160	A	C	D	C	D	G	H	H	K	K	M	N	N										
01705	150	B	C	D	C	D	D	H	H	K	K	M	N	N										
01506	140	A	A	D	A	D	D	H	H	K	L	M	N	N										
01507	130	B	C	D	C	D	D	H	H	K	K	M	N	N										
01508	120	A	C	D	C	D	D	D	D	K	K	M	N	N										
01509	110	A	C	D	C	D	D	H	H	K	K	M	N	N										
01510	100	A	A	D	A	D	D	H	H	K	K	M	N	N										
01511	90	A	A	D	A	D	D	D	D	K	K	M	N	N										
01512	80	A	A	D	A	D	D	D	D	K	K	M	N	N										
01513	70	A	C	D	C	D	D	H	H	K	K	M	N	N										
01514	60	A	C	D	C	D	D	H	H	K	K	M	N	N										
01515	50	A	C	D	C	D	D	H	H	K	K	M	N	N										
ECO 100		30	31	47	67	68	69	71	78	96	113	157	158	159										

N-100/S µP (2K • 4PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
[illegible]	[illegible]	A	A	D	D																			
[illegible]	[illegible]	A	A	D	D																			
[illegible]	[illegible]	A	C	D	D																			
[illegible]	[illegible]	B	B	D	D																			
[illegible]	[illegible]	A	A	D	D																			
[illegible]	[illegible]	A	C	D	D																			
[illegible]	[illegible]	A	C	D	D																			
[illegible]	[illegible]	A	C	D	D																			
[illegible]	[illegible]	A	A	D	D																			
[illegible]	[illegible]	A	C	D	D																			
[illegible]	[illegible]	A	A	D	D																			
[illegible]	[illegible]	A	A	D	D																			
[illegible]	[illegible]	A	A	D	D																			
[illegible]	[illegible]	A	A	D	E																			
[illegible]	[illegible]	B	B	D	E																			
[illegible]	50	A	C	D	E																			
[illegible]	208	A	A	D	D																			
[illegible]	[illegible]	A	A	D	D																			
[illegible]	[illegible]	A	A	D	D																			
ECO 500		273	301	375	490																			

Note:
Can not be used on 322602

COMMERCIAL EXTENDED CX 48BIT

322553

ECO 500-490

NO 100 CX MICROPROGRAM REGISTRATION SHEET

PROGRAM AND MAP

3033 6 6

NORSK DATA A.S
Oslo Norway

DEV [redacted]ELECT 32 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
05200	2E																							
05200	3E																							
ECO 100·																								

MICRO PROGRAM 256 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
05800	27F																							
05801	27G																							
05802	27H																							
ECO 100·																								

ERROR CHECK 256 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
05900	24C																							
ECO 100·																								

TEST PROM 2K × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
07000	19B																							
ECO 100·																								

REGISTER SELECT 32 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
07100	14B																							
ECO 100·																								

TD NO
322665

Corrected	Date	Sign

ND-100 MICROPROGRAM REGISTRATION SHEET	Scale	Drawn BW 2705 82
	3035	Contr
		Appr
	Replacement for	
NORSK DATA A.S Oslo, Norway		
	Replaced by	

BUSC DEVICE NO 512 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
06700	10D																							

ID NO 322669

BW 270582

3039

III-6-31

SMD FORMAT (PAL)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 9 0 0	12A	A																						
3 4 9 0 1	27E	A																						
3 4 9 0 2	25G	B																						
ECO 100-		462																						

ID NO
322673

ECO 100-462	05 09 84	DF
Corrected	Date	Sign

NO-100 MICROPROGRAM REGISTRATION SHEET	Print no / Scale 3043	Drawn DF 11 01 84 Contr Page 1 of 1
NORSK DATA A.S Oslo, Norway	Replacement for Replaced by	

DMA DEVICE NO 32 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 1 2 0 0	8D																							
ECO 100-																								

SMD FIFO (PAL)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 7 0 0	20H																							
ECO 100-																								

DEV. DECODE UPPER 32 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 8 0 0	6D																							
ECO 100																								

ID NO 322674

Correction | Date | Sign

ND · 100
MICROPROGRAM REGISTRATION
[illegible]ET

Print no: / Scale: 3044
Drawn BW 02.12.8
Contr
Page 1 of 1
Replacement for
Replaced by

NOR[illegible]DATA A.S
Oslo, Norway

DEV NO & IDENT 32×8

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 5 2 0 0	10 E																							
3 5 2 0 1	11 E																							
ECO 100-																								

III-6-6-33

		TEKO 322675
Corrected	Date	Sign
ND-100 MICROPROGRAM REGISTRATION SHEET	Print no / Scale 3045	Drawn DF 31.01.85
		Contr
		Page 1 of 1
		Replacement for
NORSK DATA A.S Oslo, Norway		Replaced by

DEV NO & IDENT 32×8

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
35300	10E																							
35301	11E																							
ECO 100																								

ID NO. 322676

Corrected | Date | Sign

ND-100
MICROPROGRAM REGISTRATION SHEET

Print no.:
Scale
3046

Drawn OF 02.02.8
Constr
Page of

Replacement for

NO[illegible]ATA A.S
Oslo, Norway

Replaced by

PIOC DEVICE NO + IDENT (32 x 8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 7 2 0 0	7C																							
0 7 2 0 1	10C																							
ECO 100-																								

PIOC ADDRESS DECODING (256 x 4 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 7 3 0 0	12B																							
0 7 3 0 1	21G																							
ECO 100-																								

PIOC CONTROL SIGNAL DECODER (512 x 8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 7 4 0 0	21H																							
ECO 100-																								

PIOC FIRMWARE (4 x 8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 7 5 0 0	13G																							
0 7 5 0 1	15G																							
ECO 100-																								

PIOC PROTECT LOGIC

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
0 8 7 0 0	14E																	
ECO 100-																		

115 40
324001

NO-100
MICROPROGRAM REGISTRATION
SHEET

3101

Drawn BW 2805 82

NORSK DATA A.S
Oslo Norway

PIOC ADDRESS DECODING (256 x 4 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
07300	6H																							
07301	7G																							
ECO 100-																								

ETHERNET (32 x 8 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
08900	7C																							
08901	10C																							
ECO 100-																								

ETHERNET CONTROL SIGNAL DECODER (512 x 8 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09000	11E																							
ECO 100-																								

ETHERNET FIRMWARE (4K x 16 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09100	15D																							
09101	13D																							
ECO 100-																								

ETHERNET - PROTECT - LOGIC (512 x 4 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09200	31A																							
ECO 100-																								

III - 6 - 6 - 36

Dr. No. 324002

Corrected

ND-100
MICROPROGRAM REGISTRATION
SHEET 3102

NORSK DATA A.S
Oslo, Norway

OCTO MATCH (512x4)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 0 8 0 0	19C																							
ECO 100-																								

OCTO TIMING (512x4)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 0 9 0 0	23E																							
ECO 100-																								

		TD NO 324003
Corrected	Date	Sign
ND-100 MICROPROGRAM REGISTRATION SHEET	Print no / Scale 3103	Drawn TRO 03.06.83
		Contr
		Page of
		Replacement for
NORSK DATA A.S Oslo, Norway		Replaced by

PANEL 100 2048 x 8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0110 0	30C																							
ECO 100																								

IQ NO.
324107
324004

Corrected	Date	Sign
ND-100 MICROPROGRAM REGISTRATION SHEET	Print no.: / Scale: 3104	Drawn Sund 26.11.82 Const Page of Replacement for
NORSK [redacted] S Oslo, [redacted]		Replaced by

TERMINAL DEVICE NUMBER 256×8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09300	*																							
ECO 100-																								

*: 4H, 5H

TERMINAL DEVICE NUMBER 256×8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09400	*																							
ECO 100-																								

*: 3H, 6H

TONO 324005

Corrected	Date	Sign
ND-100 MICROPROGRAM REGISTRATION SHEET	Print no. 3105	Drawn 31.01.83
		Comp
		Appr
	Replacement for	
NORSK DATA A.S Oslo, Norway	Replaced by	

DEVICE NO. BIT (0-7) (32×8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
00900	8C																							
ECO 100-																								

DEVICE NO. BIT (8-15) (32×8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
05800	3C																							
ECO 100-																								

FLOPPY & STREAMER MICROPROGRAM (8K×8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
34300	12G	B																						
ECO 100-		434																						

MEMORY ADDRESS DECODING (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
34400	12F																							
ECO 100-																								

BYTE WORD CONVERTER (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
34500	11E	B																				
ECO 100-		434																				

STREAMER CONTROLLER (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
34600	14B																					
ECO 100-																						

ID.NO. 324006

ECO 100-434 18.07.84 OF

Corrected Date Sign

ND-100
MICROPROGRAM REGISTRATION SHEET

Print no./Scale 3106
Drawn Eaul 17.11.83
Contr.
Page 1 of 1
Replacement for
Replaced by

NORS … A.S
Os … ay

TERMINAL DEVICE NUMBER 256*8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09300	*																							
ECO 100-																								

*: 3H, 5H

TERMINAL DEVICE NUMBER 256*8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09400	*																							
ECO 100-																								

*: 2H, 7H

TERMINAL CONTROL SIGNAL 512*4 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09500	20B																							
ECO 100-																								

TONO
324007
324108

Corrected	Date	Sign

ND-100 MICROPROGRAM REGISTRATION SHEET	Print no. 3107	Drawn Ruud 21.01.83 Contr Appr Replacement for
NORSK DATA A.S Oslo, Norway		Replaced by

PIOC DEVICE NO+IDENT (32x8 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 7 2 0 0	7C																							
0 7 2 0 1	10C																							
ECO 100-																								

PIOC ADDRESS DECODING (256x4 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 7 3 0 0	12B																							
ECO 100-																								

PIOC FIRMWARE (4x8 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 7 5 0 0	13G																							
0 7 5 0 1	15G																							
ECO 100-																								

PIOC PROTECT LOGIC

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 5 6 0 0	14E																							
ECO 100-																								

XOOWN-LOGIC

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 1 5 0 0	20A																							
3 1 5 0 1	20B																							
ECO 100-																								

ID NO 324008 324110

ENG.SPEC.84-043	04.04.84	Eund
Corrected	Date	Sign
ND-100 MICROPROGRAM REGISTRATION SHEET	Print no / Scale 3108	Drawn OF 01.11.83; Contr AEM; Page 1 of 2
	Replacement for	
NOR A A.S Osl way	Replaced by	

BANK-SELECT-256

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
31600	4A																							
ECO 100-																								

Only valid for 324008

PIOC-MEM-CONTROL

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
31700	11H	B																						
ECO 100-	429	496																						

PIOC-INT-ACK (512x8 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
31800	21H																							
ECO 100-																								

PIOC-256-HIGH-ADR (256x4 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
31900	21G																							
ECO 100-																								

Only valid for 324008

PIOC-64-HIGH-ADR (256x4 PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
32000	21G																							
ECO 100-																								

Only valid for 324110

BANK-SELECT-64

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
32100	4A																							
ECO 100-																								

Only valid for 324110

PIOC-DRAM-CONTROL

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V
36300	15H	B																		
ECO 100-	429	481																		

III-6-6-43

ECO 100-429,481, 496 | 14.02.85 | DF/HEAR

Corrected | Date | Sign

NO-100 MICROPROGRAM REGISTRATION SHEET

Print no / Scale: 3108

Drawn DF 01.11.83

Contr AEM

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Replacement for

NORSK DATA A.S
Oslo, Norway

Replaced by

ID NO 324006 324110

DEV NO & IDENT 32x8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
36700	8C																							
36701	5C																							
ECO 100-																								

ERROR CODES 32x8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
36800	2G																							
ECO 100-																								

CTI TIMING (PAL)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
36900	18H																							
ECO 100-																								

hh-9-9-III

TD NO 324010

Corrected	Date	Sign

ND-100
MICROPROGRAM REGISTRATION
SHEET

Print no / Scale 3110
Drawn TRO 05.10.84
Contr
Page 1 of 1
Replacement for

NORSK [illegible] A.S
Oslo

Replaced by

TERMINAL DEVICE NUMBER (256×8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09300	*																							
ECO 100-																								

* 2H, 4H

TERMINAL DEVICE NUMBER (256×8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09400	*																							
ECO 100-																								

* 1H, 5H

TERMINAL CONTROL SIGNAL (512×4 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09500	19B																							
ECO 100-																								

BUS CONTROL (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
35800	2C																					
ECO 100-																						

TO NO 324011

Corrected | Date | Sign

ND-100 MICROPROGRAM REGISTRATION SHEET

Print no / Scale 3111

Drawn OK 220584

Contr

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Replacement for

NORSK DATA A.S
Oslo, Norway

Replaced by

FIFO RESET (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
35900	20F																							
ECO 100-																								

IO CYCLE CONTROL (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
36000	*																							
ECO 100-																								

* : 11H, 29H

FIFO CONTROL (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
36100	*																							
ECO 100-																								

* : 7F, 17G, 25G, 27G

DTR & FLOW CONTROL (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
36200	*																					
ECO 100-																						

* : 7B, 11B, 13B, 17B, 20B, 21B, 26B, 31B

IO.NO 324011

Corrected | Date | Sign

ND-100
MICROPROG[illegible] REGISTRATION

Print no: Scale 3111 | Drawn 24.05.84 | Contr | Page 2 of 2

Replacement for

Replaced by

NORSK DATA A.S
Oslo, Norway

DEVICE NO BIT (0-7) [illegible] PROM)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 0 9 0 0	8C																							
ECO 100 -																								

DEVICE NO BIT (8-15) (32×8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 5 8 0 0	3C																							
ECO 100 -																								

FLOPPY & STREAMER MICROPROGRAM (8K×8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 3 0 0	12G																							
ECO 100 -																								

MEMORY ADDRESS DECODING (PAL)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 4 0 0	12F																							
ECO 100 -																								

BYTE WORD CONVERTER (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 5 0 0	11E																							
ECO 100 -																								

STREAMER CONTROLLER (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
3 4 6 0 0	14B																					
ECO 100 -																						

WRITE PRECOMP (1024×4 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
3 5 7 0 0	24B																					
ECO 100 -																						

III - 6 - 6 - 47

Corrected	Date	Sign
ND-100 MICROPROGRAM REGISTRATION SHEET	Print no / Scale 3112	Drawn DF 28.05. / Contr / Page 1 of 1
NORSK DATA A.S Oslo, Norway	Replacement for / Replaced by	

TO NO. 324012

10 MB DISK 32 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 1 2 0 0	10F	B																						
ECO 100-		256																						

ID NO 324105

ND-100
MICROPROGRAM REGISTRATION
SHEET

3038

BW 14 05 87

NORSK DATA A.S

SMD FORMAT(PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
34900	12A	A																						
34901	27E	A																						
34902	25G	B	C																					
ECO 100-		462	467																					

III-6-9-49

		ID NO 324116 322673
ECO 100-462,467	01.10.84	DF
ID NO 324116 ADDED	28.11.84	TRo
Corrected	Date	Sign

ND-100
MICROPROGRAM REGISTRATION
SHEET

Print no./ Scale 3043

Drawn DF 11.01.84
Contr
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Replacement for

NORSK DATA A.S
Oslo, Norway

Replaced by

DMA DEVICE NO 32 x 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 1 2 0 0	80																							
ECO 100-																								

SMD FIFO (PAL)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 7 0 0	20H																							
ECO 100-																								

DEV DECODE UPPER 32x8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 8 0 0	60																							
ECO 100-																								

III-6-5-50

I.D.NO
324117
322674

I.D.NO 324117 ADDED	28.11.84	TRo
Corrected	Date	Sign

NO-100
MICROPROGRAM REGISTRATION

Print no.: 3044 Scale
Drawn BW 07.12.83
Contr
Page 1 of 1
Replacement for

NORSK DATA A.S
Oslo, Norway

Replaced by

IDENT CONTROL (PAL)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
36600	7C																							
ECO 100-																								

15-9-III

TD NO
324118

Corrected	Date	Sign.
ND-100 MICROPROGRAM REGISTRATION SHEET	Print no.1 Scale 3109	Drawn TRO 04.10.84 Contr. Page of
	Replacement for	
NORSK DATA A.S Oslo, Norway		
	Replaced by	

TERMINAL DEVICE NUMBER (256×8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09300	*																							
ECO 100-																								

*: 2H, 4H

TERMINAL DEVICE NUMBER (256×8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09400	*																							
ECO 100-																								

* 1H, 5H.

TERMINAL CONTROL SIGNAL (512×4 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
09500	19B																							
ECO 100-																								

BUS CONTROL (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
35800	2C																					
ECO 100-																						

III-6-9-52

ID NO.
324119
324011

Corrected | Date | Sign.

ND-100
MICROPROGRAM REGISTRATION

Print no / Scale 3111

Drawn 220584
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Page 1 of 2

Replacement for

NORSK DATA A.S
Oslo, Norway

Replaced by

FIFO RESET (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
35900	20F																							
ECO 100-																								

IO CYCLE CONTROL (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
36000	*																							
ECO 100-																								

*: 11H, 29H

FIFO CONTROL (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
36100	*																							
ECO 100-																								

*: 7F, 17G, 25G, 27G

DTR & FLOW CONTROL (PAL)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
36200	*																					
ECO 100-																						

*: 7B, 11B, 13B, 17B, 20B, 21B, 26B, 31B

III-6-6-53

IO NO. 324119 324011

Corrected	Date	Sign.
ND-100 MICROPROGRAM REGISTRATION SHEET	Print no./Scale 3111	Drawn OHP 24.05.84
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		Page 2 of 2
NORSK DATA A.S Oslo, Norway	Replacement for	
	Replaced by	

PANEL MICROCODE (EPROM MICROCOMPUTER)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
36 5 0 0	IC1	8																						
ECO 100-		494																						

ECO100: 494	14.02.85	HEBR
Corrected	Date	Sign

ID.NO 324475

ND-100
MICROPROGRAM REGISTRATION
SHEET

Print no / Scale: 1815
Drawn: OHP 18.07.84
Contr:
Page 1 of 1
Replacement for:
Replaced by:

NORS[illegible]A A.S
Os[illegible]ay

PANEL MICROCODE (EPROM MICROCOMPUTER)

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
36500	IC1	B																						
ECO 100-		494																						

55-9-9-III

		TD NO. 324494
ECO 100-494	14.02.85	HCAR
ENG SPEC 85-001 Corrected	07.05.85 Date	Sign OF
ND-100 MICROPROGRAM REGISTRATION SHEET	Print no / Scale 1834	Drawn OHP 18.07.84 Contr Page 1 of 1
NORSK DATA A.S Oslo, Norway	Replacement for	Replaced by

Switches on the CPU modules (3002 and 3033)

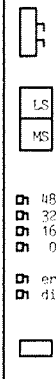
13J	Baudrate
0	110
1	150
2	300
3	2400
4	1200
5	1800
6	4800
7	9600
8	2400
9	600
10	200
11	134.5
12	75
13	50
14	100
15	100

14J	ALD/I12	LOCK and s.b.power ok	LOCK and s.b.power not ok	UNLOCK and load
15	0	start in 20	stop	nothing
14	1560	start in 20	binary load 1560	binary load 1560
13	20500	start in 20	mass load 500	mass load 500
12	21540	start in 20	mass load 1540	mass load 1540
11	400	start in 20	binary load 400	binary load 400
10	1600	start in 20	binary load 1600	binary load 1600
9		start in 20		
8		start in 20		
7	100000	stop		
6	101560	binary load 1560	binary load 1560	binary load 1560
5	120500	mass load 500	mass load 500	mass load 500
4	121540	mass load 1540	mass load 1540	mass load 1540
3	100400	binary load 400	binary load 400	binary load 400
2	101600	binary load 1600	binary load 1600	binary load 1600

Switches and indicators on 10MB DISK CONTROLLER (3004).

8J	Device name	Dev.no.	ident
0	Disk system 1	500-507	1
1	Disk system 2	510-517	5

Switches and indicators on DYNAMIC RAM (3005)



The most frequent switchsettings on the 64 Kw modules and their corresponding address range and bank numbers:

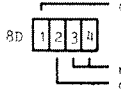
low.lim	address range	bank
00	0- 177777	0
04	200000- 377777	1
10	400000- 577777	2
14	600000- 777777	3
20	1000000- 1177777	4
24	1200000- 1377777	5
30	1400000- 1577777	6
34	1600000- 1777777	7
40	2000000- 2177777	10
44	2200000- 2377777	11
50	2400000- 2577777	12
54	2600000- 2777777	13
60	3000000- 3177777	14
64	3200000- 3377777	15
70	3400000- 3577777	16
74	3600000- 3777777	17
88	position dependant	

Max switchsetting with meaning on this card when not 88 is 77.

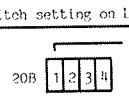
Switch and indicators on PERTEC MAGNETIC TAPE CONTROLLER (3006).

8J	Device name	Dev.no.	ident
2	Mag.tape cont. 1	520-527	3
3	Mag.tape cont. 2	530-537	7

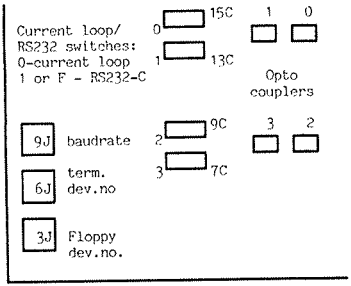
Switch setting on EURO BUS ADAPTER (3008).



Switch setting on LOCAL I/O BUS (3009).



Switches on FLOPPY AND 4 TERMINALS module (3010)

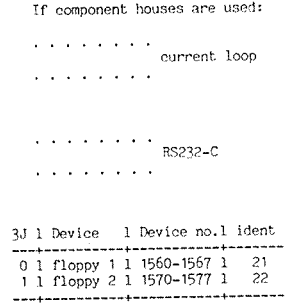


9J	Baudrate
0	110
1	150
2	300
3	2400
4	1200
5	1800
6	4800
7	9600
8	2400
9	600
10	200
11	134.5
12	75
13	50
14	100
15	100

6J	Term.	Device no.	ident
0	1- 4	300- 337	120-123
1	5- 8	340- 377	44- 47
2	9-12	1300-1337	50- 53
3	13-16	1340-1377	54- 57
4	33-36	600- 677	124-127
5	37-40	1100-1137	130-133
6	41-44	1140-1177	134-137
7	45-48	1400-1437	140-143
8	49-52	1500-1537	144-147
9	53-56	1640-1677	150-153
10	57-60	1700-1737	154-157
11	61-63	1740-1777	160-163
12	17-20	200- 237	60- 63
13	21-24	240- 277	64- 67
14	25-28	1200-1237	70- 73
15	29-32	1240-1277	74- 77

Also valid for 8 TERMINALS module.

If component houses are used:



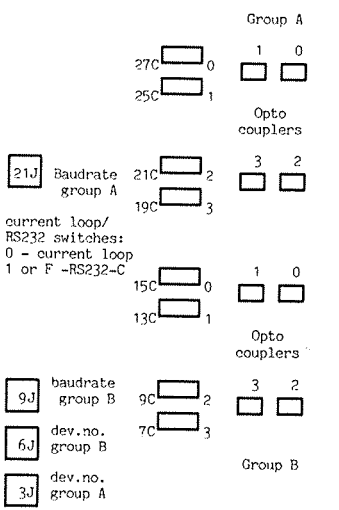
3J	Device	Device no.	ident
0	floppy 1	1560-1567	21
1	floppy 2	1570-1577	22

Switch/indicator on MEMORY MANAGEMENT/MEMORY MANAGEMENT II (3012/3104)

cache disable indicator
D1 lit when disable

6J cache disable

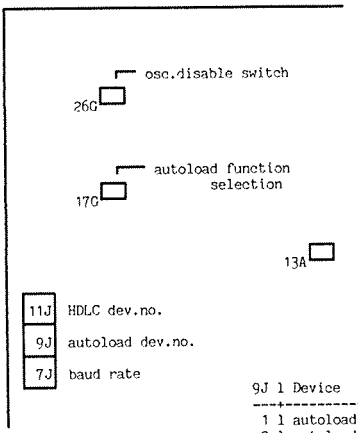
Switches on 8 TERMINALS INTERFACE (3013).



9J 1	Baudrate	1
0 1	110	1
1 1	150	1
2 1	300	1
3 1	2400	1
4 1	1200	1
5 1	1800	1
6 1	4800	1
7 1	9600	1
8 1	2400	1
9 1	600	1
10 1	200	1
11 1	134.5	1
12 1	75	1
13 1	50	1
14 1	100	1
15 1	100	1

Dev.no.switches
see 3010

Switches on HDLC + AUTOLOAD CONTROLLER (3015).



7J	1	baudrate	1
0	1	307.2 Kbaud	1
3	1	1.2 Kbaud	1
6	1	9.6 Kbaud	1
7	1	38.4 Kbaud	1
8	1	153.6 Kbaud	1
9	1	76.8 Kbaud	1
11	1	19.2 Kbaud	1
13	1	4.8 Kbaud	1
14	1	2.4 Kbaud	1

17G	1
4321	1
1	0 1 disable MCL
1	0 1 disable LOAD
1	0 1 disable RML
1	0 1 disable CLOAD

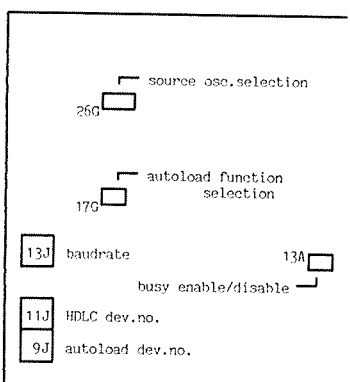
9J	1	Device	1	device no.	1	ident	1
1	1	autoload 1	1	1604 - 1607	1	-	1
2	1	autoload 2	1	1610 - 1613	1	-	1
3	1	autoload 3	1	1614 - 1617	1	-	1
4	1	autoload 4	1	1620 - 1623	1	-	1
5	1	autoload 5	1	1624 - 1627	1	-	1
6	1	autoload 6	1	1630 - 1633	1	-	1
7	1	autoload 7	1	1634 - 1637	1	-	1

26G	1
4321	1
xx0x	1 disable baudrate osc.
x0xx	1 disable main clock
	1 (should always be on)

11J	1	Device	1	device no.	1	ident	1
0	1	HDLC 1	1	1640 - 1657	1	140	1
1	1	HDLC 2	1	1660 - 1677	1	151	1
2	1	HDLC 3	1	1700 - 1717	1	152	1
3	1	HDLC 4	1	1720 - 1737	1	153	1
4	1	HDLC 5	1	1740 - 1757	1	154	1
5	1	HDLC 6	1	1760 - 1777	1	155	1
6	1	HASP 1	1	560 - 577	1	156	1
7	1	HASP 2	1	620 - 637	1	157	1
8	1	HASP 3	1	700 - 717	1	160	1
9	1	HASP 4	1	720 - 737	1	161	1
10	1	HASP 5	1	1500 - 1517	1	162	1
11	1	HASP 6	1	1520 - 1537	1	163	1

13A	1
4321	1
0	1 X21
0	1 computer link
0	1 V35
0	1 V24

Switches and indicator on MEGALINK interface (3023).



7J	baudrate
0	307.2 Kbaud
3	1.2 Kbaud
6	9.6 Kbaud
7	38.4 Kbaud
8	153.6 Kbaud
9	76.8 Kbaud
11	19.2 Kbaud
13	4.8 Kbaud
14	2.4 Kbaud

17G	4321	
	0	disable MCL
	0	disable LOAD
	0	disable RML
0		disable CLOAD

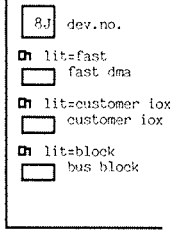
26G	654321	
	01011x	baudrate via 13J
	01101x	special 0,6 Mbaud
	11001x	special 1,0 Mbaud
	x0xxxx	main osc. test
	xxxx0x	baudrate osc.test

13A	4321	
	xx01	busy enable
	xx10	busy disable

9J	Device	device no.	ident
1	autoload 1	1604 - 1607	-
2	autoload 2	1610 - 1613	-
3	autoload 3	1614 - 1617	-
4	autoload 4	1620 - 1623	-
5	autoload 5	1624 - 1627	-
6	autoload 6	1630 - 1633	-
7	autoload 7	1634 - 1637	-

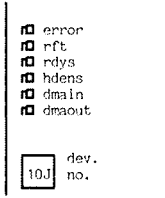
11J	Device	device no.	ident
0	MEGALINK 1	1640 - 1657	140
1	MEGALINK 1	1660 - 1677	151
2	MEGALINK 1	1700 - 1717	152
3	MEGALINK 1	1720 - 1737	153
4	MEGALINK 1	1740 - 1757	154
5	MEGALINK 1	1760 - 1777	155

Switches and indicators on N10 BUS ADAPTER (3024).



8J		Device		Device number	
0	1	Bus adapter	1	100040 - 100041	1
1	1	Bus adapter	2	100042 - 100043	1
2	1	Bus adapter	3	100044 - 100045	1
3	1	Bus adapter	4	100046 - 100047	1
4	1	Bus adapter	5	100050 - 100051	1
5	1	Bus adapter	6	100052 - 100053	1
6	1	Bus adapter	7	100054 - 100055	1
7	1	Bus adapter	8	100056 - 100057	1
8	1	Bus adapter	9	100060 - 100061	1
9	1	Bus adapter	10	100062 - 100063	1
10	1	Bus adapter	11	100064 - 100065	1
11	1	Bus adapter	12	100066 - 100067	1
12	1	Bus adapter	13	100070 - 100071	1
13	1	Bus adapter	14	100072 - 100073	1
14	1	Bus adapter	15	100074 - 100075	1
15	1	Bus adapter	16	100076 - 100077	1

Switch and indicators on STC MAGTAPE CONTROLLER (3020).



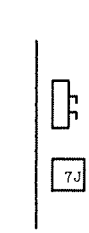
8J	1	Device name		Dev.no.		ident	1
2	1	Mag.tape cont.	1	520-527	1	3	1
3	1	Mag.tape cont.	2	530-537	1	7	1

Switchsetting on ND-500 interface (3022).

12J	1	device	1	device number	1	ident	1
1	1	ND-500 1	1	60 - 77	1	16	1
2	1	ND-500 2	1	1060 - 1077	1	116	1
3	1	ND-500 3	1	660 - 677	1	36	1
4	1	ND-500 4	1	760 - 777	1	114	1
5	1	ND-500 5	1	560 - 577	1	76	1

Switch and indicator on FLOPPY DISK CONTROLLER (3027).

7J	Device name	Device no.	ident
0	Floppy disk controller 1	1560-1567	21
1	Floppy disk controller 2	1570-1577	22

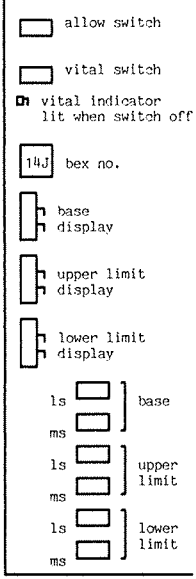


error codes:

E00	ok
E05	crc-error
E06	sector not found
E07	track not found
E10	format not found
E11	diskette defect (impossible to format)
E12	format mismatch
E13	illegal format
E14	single-sided diskette inserted
E15	double-sided diskette inserted
E16	write-protected diskette
E17	deleted record
E20	drive not ready
E21	controller busy on start
E22	lost data (over-or underrun)
E23	track zero not detected
E24	vco-frequency out of range
E25	microprogram out of range
E26	timeout
E27	undefined error
E30	track out of range
E31	ram error
E32	compare error
E33	internal dma-error
E40	ND-100 bus error during command fetch
E40	ND-100 bus error during status transfer
E42	ND-100 bus error during data transfer
E43	illegal command
E44	wordcount not zero
E50	no bootstrap found on diskette
E51	wrong bootstrap (too old version of floppy-monitor).
E70	prom checksum error
E71	ram error
E72	ctc error
E73	dmactrl error
E74	vco error
E75	floppy control error

selftest errors

Switches and indicators on BUS EXPANDER module (3028).



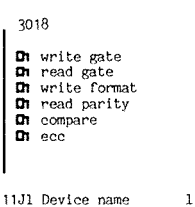
14J	device	device no.	ident
0	Bex 1	100000-100003	10
1	Bex 2	100004-100007	11
2	Bex 3	100010-100013	12
3	Bex 4	100014-100017	13
4	Bex 5	100020-100023	14
5	Bex 6	100024-100027	15
6	Bex 7	100030-100033	16
7	Bex 8	100034-100037	17

Crate address=presented addr. - LL + BASE

For addresses < 1MW: LL = BASE
then crate address = presented address

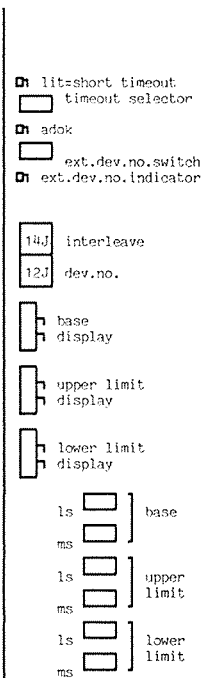
Vital switch off:PF int.on lev.13 from I/O
Vital switch on :PF int.on lev.14 from I/O

Switch and indicators on ECC DISK CONTROLLER (3018 and 3019).



11J	Device name	Dev.no.	ident
8	Big Disk system 1	1540-1547	17
9	Big Disk system 2	1550-1557	20

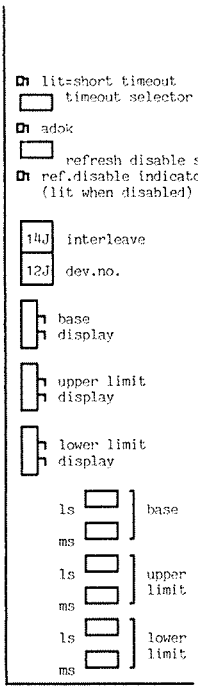
Switches and inicators on N100 BUS CONTROLLER (3031/3039).



12J	device number	id.	ex.dev.no. indicator
0	100200-100203	20	not lit
1	100204-100207	21	not lit
2	100210-100213	22	not lit
3	100214-100217	23	not lit
4	100220-100223	24	not lit
5	100224-100227	25	not lit
6	100230-100233	26	not lit
7	100234-100237	27	not lit
8	100240-100243	30	not lit
9	100244-100247	31	not lit
10	100250-100253	32	not lit
11	100254-100257	33	not lit
12	100260-100263	34	not lit
13	100264-100267	35	not lit
14	100270-100273	36	not lit
15	100274-100277	37	not lit
0	100300-100303	40	lit
1	100304-100307	41	lit
2	100310-100313	42	lit
3	100314-100317	43	lit
4	100320-100323	44	lit
5	100324-100327	45	lit
6	100330-100333	46	lit
7	100334-100337	47	lit
8	100340-100343	50	lit
9	100344-100347	51	lit
10	100350-100353	52	lit
11	100354-100357	53	lit
12	100360-100363	54	lit
13	100364-100367	55	lit
14	100370-100373	56	lit
15	100374-100377	57	lit

14J	interleave	vital	delay
0	none	yes	no
1	2-way	yes	no
2	4-way	yes	no
3	8-way	yes	no
4	none	no	no
5	2-way	no	no
6	4-way	no	no
7	8-way	no	no
8	none	yes	yes
9	2-way	yes	yes
10	4-way	yes	yes
11	8-way	yes	yes
12	none	no	yes
13	2-way	no	yes
14	4-way	no	yes
15	8-way	no	yes

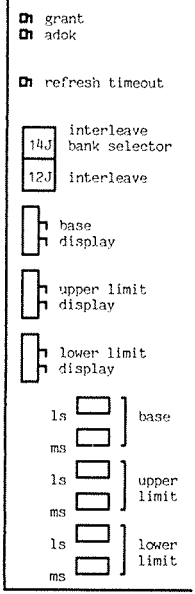
Switches and inicators on N100 BUS CONTROLLER (3039) vers.J or later.



12J	device number	id.
0	100200-100203	20
1	100204-100207	21
2	100210-100213	22
3	100214-100217	23
4	100220-100223	24
5	100224-100227	25
6	100230-100233	26
7	100234-100237	27
8	100240-100243	30
9	100244-100247	31
10	100250-100253	32
11	100254-100257	33
12	100260-100263	34
13	100264-100267	35
14	100270-100273	36
15	100274-100277	37

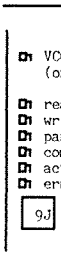
14J	interleave	vital	delay
0	none	yes	no
1	2-way	yes	no
2	4-way	yes	no
3	8-way	yes	no
4	none	no	no
5	2-way	no	no
6	4-way	no	no
7	8-way	no	no
8	none	yes	yes
9	2-way	yes	yes
10	4-way	yes	yes
11	8-way	yes	yes
12	none	no	yes
13	2-way	no	yes
14	4-way	no	yes
15	8-way	no	yes

Switches and inicators on MEMORY PORT-MPM4 (3032).



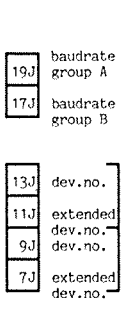
14J	interleave	speedup	write parity
0	none	no	no
1	2-way	no	no
2	4-way	no	no
3	8-way	no	no
4	none	yes	no
5	2-way	yes	no
6	4-way	yes	no
7	8-way	yes	no
8	none	no	yes
9	2-way	no	yes
10	4-way	no	yes
11	8-way	no	yes
12	none	yes	yes
13	2-way	yes	yes
14	4-way	yes	yes
15	8-way	yes	yes

Switches and indicators on 8"- and 5 1/4" DISK CONTROLLER (3038/3041)



9J	Device name	dev.no.	
0	Disk system 1	500-507	1
1	Disk system 2	510-517	5

Switches on 8-TELEX INTERFACE (3105).



17J	1		1
19J	1	Baudrate	1
0	1	110	1
1	1	150	1
2	1	300	1
3	1	2400	1
4	1	1200	1
5	1	1800	1
6	1	4800	1
7	1	9600	1
8	1	2400	1
9	1	600	1
10	1	200	1
11	1	134.5	1
12	1	75	1
13	1	50	1
14	1	100	1
15	1	100	1

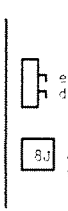
9J or 13J on 3105
7J or 11J on 3105

1	1	terminals	1	device number	1
0	1	0	1	1 - 4	1	300- 337	1
1	1	0	1	5 - 8	1	340- 377	1
2	1	0	1	9 - 12	1	1300- 1337	1
3	1	0	1	13 - 16	1	1340- 1377	1
4	1	0	1	33 - 36	1	640- 677	1
5	1	0	1	37 - 40	1	1100- 1137	1
6	1	0	1	41 - 44	1	1140- 1177	1
7	1	0	1	45 - 48	1	1400- 1437	1
8	1	0	1	49 - 52	1	1500- 1537	1
9	1	0	1	53 - 56	1	1640- 1677	1
10	1	0	1	57 - 60	1	1700- 1737	1
11	1	0	1	61 - 64	1	1740- 1777	1
12	1	0	1	17 - 20	1	200- 237	1
13	1	0	1	21 - 24	1	240- 277	1
14	1	0	1	25 - 28	1	1200- 1237	1
15	1	0	1	29 - 32	1	1240- 1277	1
0	1	1	1	65 - 68	1	140400-140437	1
1	1	1	1	69 - 72	1	140440-140477	1
2	1	1	1	73 - 76	1	140500-140537	1
3	1	1	1	77 - 80	1	140540-140577	1
4	1	1	1	81 - 84	1	140600-140637	1
5	1	1	1	85 - 88	1	140640-140677	1
6	1	1	1	89 - 92	1	140700-140737	1
7	1	1	1	93 - 96	1	140740-140777	1
8	1	1	1	97 - 100	1	141000-141037	1
9	1	1	1	101 - 104	1	141040-141077	1
10	1	1	1	105 - 108	1	141100-141137	1
11	1	1	1	109 - 112	1	141140-141177	1
12	1	1	1	113 - 116	1	141200-141237	1
13	1	1	1	117 - 120	1	141240-141277	1
14	1	1	1	121 - 124	1	141300-141337	1
15	1	1	1	125 - 128	1	141340-141377	1

8J or 12J on 3107
10J or 14J on 3107

Switch and indicator on FLOPPY AND STREAMER CONTROLLER (3106).

8J	Device name	Device no.	ident
0	Floppy disk controller 1	1560-1567	21
1	Floppy disk controller 2	1570-1577	22



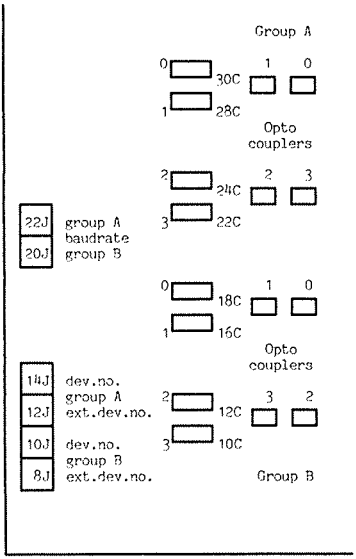
error codes:

E00	ok
E05	crc-error
E06	sector not found
E07	track not found
E10	format not found
E11	diskette defect (impossible to format)
E12	format mismatch
E13	illegal format
E14	single-sided diskette inserted
E15	double-sided diskette inserted
E16	write-protected diskette
E17	deleted record
E20	drive not ready
E21	controller busy on start
E22	lost data (over-or underrun)
E23	track zero not detected
E24	vco-frequency out of range
E25	microprogram out of range
E26	timeout
E27	undefined error
E30	track out of range
E32	compare error
E33	internal dma-error
E40	ND-100 bus error during command fetch
E40	ND-100 bus error during status transfer
E42	ND-100 bus error during data transfer
E43	illegal command
E44	wordcount not zero
E45	illegal completion
E46	addr-reg. error
E50	no bootstrap found on diskette
E51	wrong bootstrap (too old floppy-monitor
E60	streamer handshake error
E61	streamer status transfer error
E62	bad cartridge
E63	no cartridge installed
E64	end of tape,cartridge full
E65	streamer drive error
E66	unindentified exception
E67	illegal command to streamer
E70	prom checksum error
E71	ram error
E72	ctc error
E73	dmactrl error
E74	vco error
E75	floppy control error
E76	streamer data register error
E77	ND-100 register error

streamer errors

selftest errors

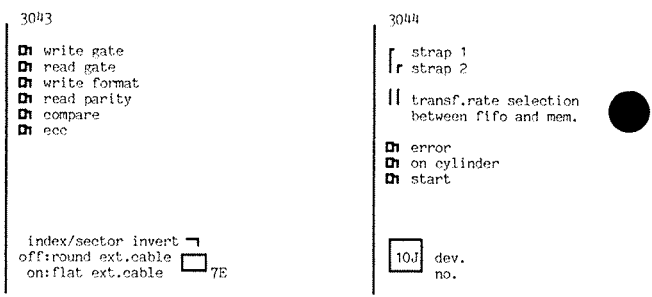
Switches on 8-TERMINALS INTERFACE (3107).



20J	1		1
22J	1	Baudrate	1
0	1	110	1
1	1	150	1
2	1	300	1
3	1	2400	1
4	1	1200	1
5	1	1800	1
6	1	4800	1
7	1	9600	1
8	1	2400	1
9	1	600	1
10	1	200	1
11	1	134.5	1
12	1	75	1
13	1	50	1
14	1	100	1
15	1	100	1

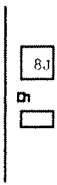
Dev.no.switches:
see 3105

Switch and indicators on 15MHz ECC DISK CONTROLLER (3043 and 3044).



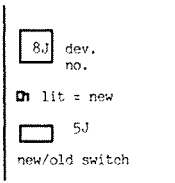
11J1 Device name	1 Dev.no.	1ident1
8 1 Big Disk system 1	1 1540-1547	1 17 1
9 1 Big Disk system 2	1 1550-1557	1 20 1

Switches and indicators on VICOM INTERFACE (3046).



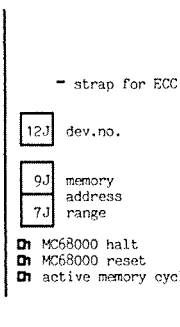
8J 1 device	1 device number	1 ident 1
0 1 Vicom 1	1 141460-141467	1 140146 1
1 1 Vicom 2	1 141470-141477	1 140147 1
2 1 Vicom 3	1 142500-142507	1 140150 1
3 1 Vicom 4	1 142510-142517	1 140151 1
4 1 Vicom 5	1 142520-142527	1 140152 1
5 1 Vicom 6	1 142530-142537	1 140153 1
6 1 Vicom 7	1 142540-142547	1 140154 1
7 1 Vicom 8	1 142550-142557	1 140155 1
8 1 Vicom 9	1 142560-142567	1 140156 1
9 1 Vicom 10	1 142570-142577	1 140157 1
10 1 Vicom 11	1 142600-142607	1 140160 1
11 1 Vicom 12	1 142610-142617	1 140161 1
12 1 Vicom 13	1 142620-142627	1 140162 1
13 1 Vicom 14	1 142630-142637	1 140163 1
14 1 Vicom 15	1 142640-142647	1 140164 1
15 1 Vicom 16	1 142650-142657	1 140165 1

Switches and indicator on UNIVERSAL DMA INTERFACE (3029).



8J	device		device number	ident
0	Univ.dma	1	140050-140057	140010
1	Univ.dma	2	140060-140067	140011
2	Univ.dma	3	140070-140077	140012
3	Univ.dma	4	140100-140107	140013
4	Univ.dma	5	140110-140117	140014
5	Univ.dma	6	140120-140127	140015
6	Univ.dma	7	140130-140137	140016
7	Univ.dma	8	140140-140147	140017
8	Univ.dma	9	140150-140157	140020
9	Univ.dma	10	140160-140167	140021
10	Univ.dma	11	140170-140177	140022
11	Univ.dma	12	140200-140207	140023
12	Univ.dma	13	140210-140217	140024
13	Univ.dma	14	140220-140227	140025
14	Univ.dma	15	140230-140237	140026
15	Univ.dma	16	140240-140247	140027

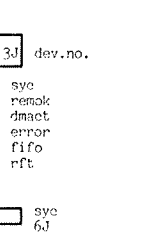
Switches and indicators on PIOC INTERFACE (3101).



12J	device		device number		ident
0	Pioc 1	1	140020-140023	1	140002
1	Pioc 2	1	140024-140027	1	140003
2	Pioc 3	1	140030-140033	1	140004
3	Pioc 4	1	140034-140037	1	140005
4	Pioc 5	1	140040-140043	1	140006
5	Pioc 6	1	140044-140047	1	140007

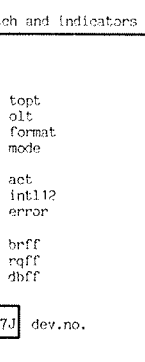
9J	7J	addr.range (kw)		bank no.
0	0	0 - 64	1	0
0	1	64 - 128	1	1
0	2	128 - 172	1	2
.	.	. - .	1	.
0	15	960 - 1024	1	15
1	0	1024 - 1088	1	16
.	.	. - .	1	.
.	.	. - .	1	.

Switches and indicators on GPIB CONTROLLER (3026).



13J	device	device number	ident
0	GPIB 1	140000-140007	140000
1	GPIB 2	140010-140017	140001
2	GPIB 3	141400-141407	140140
3	GPIB 4	141410-141417	140141
4	GPIB 5	141420-141427	140142
5	GPIB 6	141430-141437	140143
6	GPIB 7	141440-141447	140144
7	GPIB 8	141450-141457	140145

Switch and indicators on DFS INTERFACE (3035).



7J	device	device number	ident
0	DFS 1	140260-140277	140030
1	DFS 2	140300-140317	140031
2	DFS 3	140320-140337	140032
3	DFS 4	140340-140357	140033

ND TECH. TIP No.:01. Issued by RSK December 29. 1981
ND-100

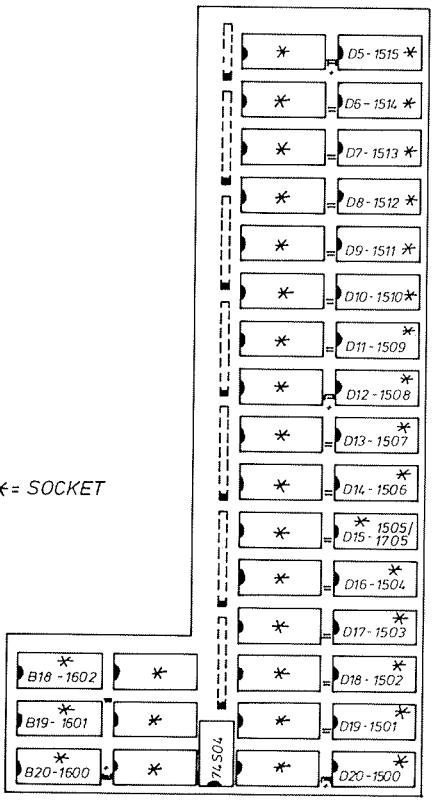
CHANGING FROM 1K TO 2K PROMS ON ND-100 CPU (322602).

When changing from 1K to 2K PROMs (32 and 48 bits floating) on ND-100 CPU
(Part No.:322602), the shadowboard 1957 PROM ADAPTER 2 still has to be used due to mechanical problems with the IC-sockets on the CPU-board.

See enclosed Arrangement Drawing for further details.
(Only 48 bits floating is described here, but PROMs for 32 bits floating are mounted in the same way).

The change is also described in ECO:100-157.

NORSK DATA A.S	PROM ADAPTER 2 1957 WITH 2K x 4 PROM	ID. NO	CARD PRINT



DRAWN BY	BW
APPROVED BY	
DATE	24/07/81

ND TECH. TIP No.:05 Rev.B Issued by RSK March 22. 1984
ND-100 (6-modules and SATELLITE

Modification of POWER FAIL on S-6003 Supplies.

In order to make the POWER FAIL circuit equal for all types of Power Supplies, a kit is now available for the "Tore Seem S-6003" Supply.

THIS MODIFICATION MUST BE DONE.

The benefit of installing the kit is to make the POWER FAIL adjustment more accurate and independent of changing CPU's.

The kit replaces the preliminary ECO's:100-347 and 100-348. (Insertion of a 10 uF Capacitor in Backwiring).

NECESSARY EQUIPMENT FOR INNSTALLATION:

KIT S-6003 POWER FAIL - PART NO.: 322991

and

Part No.:	Name	Print	ECO level
322602	N100 CPU	(3002)	- **ECO level U or higher**
OR			
322663	ND-100 CPU	(3033)	- **ECO level K or higher**

It is highly recommended to use a VARIAC to adjust Power Fail after installing the kit.

Occasionaly a DC/AC-voltmeter can be used, ref. procedure in the Installation description following the Kit.

ND TECH. TIP No.:06 Issued by LB **April 14. 1983**
ND-100

Some useful information about MMS II and "new" CPU.

1. MMS II-324004

   a. Fully compatible with the "old" MMS.

   b. Prepared for Sintran IV.

   c. Will not be used with "ND-RASK" (ND-100's successor).

2. CPU-322663

   a. Fully compatible with "old" CPU (322602). May use the same microprogram as standard ND-100.

   b. Necessary if ND-100CX. The "old" CPU can not use the CX-proms.

   c. Have both currentloop and RS232 interface.

   d. Not busallocated cache cycles if used with MMS II.

   e. "Old" MMS should have vers. R or later if used with ND-100CX.

ND TECH. TIP No.:07 Issued by LB October 06. 1983
ND-100
Error in the SHDE (shift decimal)-instruction in ND-100/CE (CPU 222602)

Symptoms.

When running under SINTRAN III, the most visible symptom will be that level 14 stops in ERRFATAL and indicates page fault on level 0. This symptom is dependant on several things:

- The SHDE-instruction must be on another level than level 0. It must perform a right shift with a short source field and a long destination field. Depending on the shift count and the difference between the field length, a number of registers on level 0 may be cleared, starting with the T register and possibly continuing successivly through the A, L, B, P, D and STS-registers.

- If the clearing proceeds down to the P-register, level 0 will continue execution in address 0 witch contains "JMP *". This is not noticed by the ordinary SINTRAN III-user.

- If the clearing stops after the A-register but before the B-register is cleared and level 0 has been interrupted in a special place in the idle-loop, a page fault on level 0 will occure if the OPR-register has a value that points to a page that gives page fault interrupt.

When this error occurs and the registers on level 0 are affected, the result of the SHDE-instruction will still be correct.

Action to correct the error.

- The microprogram for the CE CPU will not be updated. If any customer has this problem, normally those who run COBOL, they shall have CX CPU installed. The replaced CPUs shall be returned to concern stock in Oslo. A CX CPU will be returned.

ND TECH. TIP No.:08 **Issued by LB** **November 03. 1983**
ND-100

Sintran stop in ERR FATAL IIC = 0.

Due to design error on ND-100 terminal interfaces, Sintran III may stop in ERRFATAL on level 14 with IIC-code = 0. If symptom detected try to replace terminal interface(s) or do SSR 68 for Sintran III vers. H until error on terminal interfaces is corrected.

```
!-------------------------------------------------------------------!
! NORSK DATA A.S    SOFTWARE SYSTEM REPORT                          !
!     *** PRELIMINARY  FOR INTERNAL USE ONLY ***                    !
!-------------------------------------------------------------------!
! DATE: 831017 ! PRODUCT NAME: SINTRAN III VER. H                   !
!              ! PRODUCT CODE: SIN-H       REPORT NO:   68          !
!--------------!----------------------------------------------------!
! REASON (I/M/E/F/N): M    PROGRAM: ALL                             !
! SUBJECT:                                                          !
! Patch to prevent system stop in ERRFATAL when IIC=0.              !
!                                                                   !
!-------------------------------------------------------------------!
! SYMPTOM:                                                          !
!                                                                   !
!                                                                   !
!                                                                   !
!                                                                   !
!-------------------------------------------------------------------!
! DESCRIPTION:                                                      !
! This patch will give the error message ILL. INTERRUPT ON          !
! DIRECT TASK LEVEL, LEVEL=0, IIC=0.                                !
! The patch must be done after each MACL/LOAD.                      !
!-------------------------------------------------------------------!
```

```
@DMAC
)CLEAR
)CLOAD 0
141/        7ENDC=¨
7ENDC/      POFNM
)SYSDF
)9ASSM SYMBOL-2-LIST
POFNM+354/ 7ENDC                        % OLD: 000333
7ENDC/      LDT ,B -176                 % IBITNO (IIC code)
            SKP IF DT EQL ZRO
            JMP I (333                  % IIC £ 0
            JMP I (POFNM+333            % IIC = 0
)FILL
)KILL 7ENDC; 7ENDC=*; 7ENDC:
141/        7ENDC
)9EXIT
```

ND TECH. TIP No.:09 Issued by LB January 12. 1984
ND-100

Contact problems due to different thickness on IC legs.

After replacing ICs mounted on Texas low profile sockets or equivalent (square holes), be aware of the possibility of contact problems due to different thickness on IC legs. This is mostly seen on the ND-100 CPU boards where low profile sockets are specified and where IC replacements are more frequent due to modifications on the microprogram. The socket specification for ND-100 CPU boards will be changed to eliminate these problems in the future.

ND TECH. TIP No.:10 Issued by LB May 10. 1984
ND-100/NORD-10

INTERFACE PRIORITY IN ND-100 AND NORD-10

The following interfacepriority is recommended in ND-100 and NORD-10:

1. Communication DMA interfaces (HDLC, MEGALINK)
2. ND-500 interface
3. Unbuffered DMA interfaces (Mag.tape. Universal DMA etc.)
4. Buffered DMA interfaces (ECC disk, floppy DMA etc.)
5. Sync. modem interfaces
6. Other I/O interfaces (terminals, printers etc.)

Some useful information about FLOPPY-CONTROLLER 3027.

1. Difference from "old" controller:

   a. May use both single and dual sided drives.

   b. May use both single and dual density (FM and MFM).

   c. Controller and formatter on one ND-100 card.

   d. Intelligent - many drive functions are moved to the controllerboard and are stored as microprogram in PROM.

   e. Data transfer as DMA.

   f. May control up to 4 drives in daisy-chain.

2. Software requirement.

   a. New floppy-driver for Sintran.Program is much smaller, but datafield is expanded.

   b. For "stand-alone"-load from discette a new version of FLOPPY-MONITOR is required (version F or later).

3. Hardware-hints.

   a. Since this is a DMA-device,be sure "GRANT-chain" is not broken (no empty positions between CPU and FLOPPY-CONTROLLER).

   b. TERMINATION:
      If only single-sided drives are used,use termination-card no.1997 (old 1938).This card has to be connected to +5V. If both single and dual sided drives are used (or dual drives only),termination is done on one of the dual drives.Termination-card no.1997 shall not be used.If more than one dual drive,termination must be removed on all drives but one.

   c. The floppy-controller has a set of error-codes.They indicate what went wrong with a failing transfer. They are returned in status,but are also shown on a display on the floppy-controller card.OK will be displayed as 000 and errors as E05-E77.

Error codes for floppy controller 3027.

Oct. No.	Description	
00	ok	
05	crc-error	
06	sector not found	
07	track not found	
10	format not found	
11	diskette defect (impossible to format)	
12	format mismatch	
13	illegal format	
14	single-sided diskette inserted	
15	double-sided diskette inserted	
16	write-protected diskette	
17	deleted record	
20	drive not ready	
21	controller busy on start	
22	lost data (over-or underrun)	
23	track zero not detected	
24	vco-frequency out of range	
25	microprogram out of range	
26	timeout	
27	undefined error	
30	track out of range	
31	ram error	
32	compare error	
33	internal dma-error	
40	ND-100 bus error during command fetch	
40	ND-100 bus error during status transfer	
42	ND-100 bus error during data transfer	
43	illegal command	
44	wordcount not zero	
50	no bootstrap found on diskette	
51	wrong bootstrap (too old version of floppy-monitor).	
70	prom checksum error	(selftest error)
71	ram error	(selftest error)
72	ctc error	(selftest error)
73	dmactrl error	(selftest error)
74	vco error	(selftest error)
75	floppy control error	(selftest error)

Chapter 7

ND-500

ND-500

Table of contents

ND500 systems

ND520:
- One cabinett.
- Shared MPM 4. (one half in the ND100 crate and one half in the ND500 crate, 2 bank shared system).
- No cache (don't use cache).
- ND500 Micro program version 1050x or 1040x.

ND540:
- One cabinett.
- Shared MPM 4. (same as for ND520).
- 32 Kb cache size (1/4 cache).
- ND500 micro program version 1050x or 1040x.

ND550/CX:
- Two cabinett.
- 2 bank MPM 4 system.
- No cache (don't use cache).
- Micro program version 1030x or 1060x.

ND560/CXA:
- Two cabinett.
- 32 Kb, 64 Kb or 128 Kb cache size (1/4, 1/2 or 1/1 cache). Table cache size relative to memory banks.

Cache size	1/4 cache 32 Kb	1/2 cache 64 Kb	1/1 cache 128 Kb
MPM 4	2-bank	4-bank	8 bank

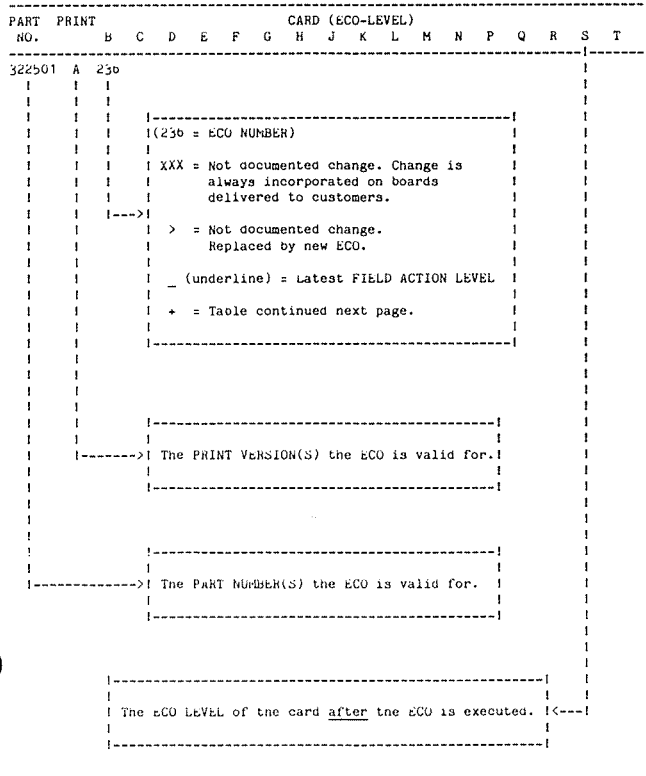
- Micro program version 1060x.

These ND500 systems are normaly delivered from Norsk Data, but earlier ND has delivered ND560 systems using MPM 3 and MPM 4. These ND560 systems has been delivered with/wihout BCD arithmetic, and therefor using different microprogram (1050x,1040x,1030x or 1060x).

ND500 MICRO PROGRAMS

	VERS:	ND-NO:
- ND500 STANDARD MICROPROGRAM (SINGLE USER)		10331
- ND500 STANDARD MICROPROGRAM	10508	10332
- ND500/AX STANDARD + ARRAY PROCESSING	10408	10338
- ND500/CX STANDARD + BCD	10308	10411
- ND500/CXA STANDARD + BCD + ARRAY PROC	10608	10412
- ND500 RTC OPTION MICRO PROGRAM	10708	10699

EXPLANATION



PART NO.	PRINT	CARD (ECO-LEVEL) B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
032XX	(A)																	
033XX	(A)																	
034XX	(A)																	
035XX	(A)																	
036XX	(A)																	
037XX	(A)																	
038XX	(A)	108																
039XX	(A)	087																
040XX	(A)																	
041XX	(A)																	
042XX	(A)																	
043XX	(A)																	
044XX	(A)																	
045XX	(A)																	
046XX	(A)	057 066																
047XX	(A)																	
048XX	(A)	057 062 100 119 126 175																
049XX	(A)																	
050XX	(A)																	
070XX	(A)																	
077XX	(A)																	
078XX	(A)																	
079XX	(A)																	
080XX	(A)																	
081XX	(A)																	
082XX	(A)																	
083XX	(A)																	
084XX	(A)																	
301XX	(A)																	

PART NO.	PRINT	MICROPROGRAM (ECO-LEVEL) 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
10000	-	078	079	080	WILL NOT BE UPD. REPLACED BY 102XX (REF.ECO:500-89).													
10100	-	092	095		WILL NOT BE UPD. REPLACED BY 104XX (REF.ECO:500-109).													
10200	-	093	096		WILL NOT BE UPD. REPLACED BY 105XX (REF.ECO:500-110).													
10303	-	-	-	-	156													
10304	-	-	-	-	-	164												
10305	-	-	-	-	-	-	170											
10306	-	-	-	-	-	-	-	176										
10307	-	-	-	-	-	-	-	-	180									
10308	-	-	-	-	-	-	-	-	-	186								
10400	-	112	114	120														
10403	-	-	-	-	155													
10404	-	-	-	-	-	165												
10405	-	-	-	-	-	-	171											
10406	-	-	-	-	-	-	-	177										
10407	-	-	-	-	-	-	-	-	181									
10408	-	-	-	-	-	-	-	-	-	187								
10500	-	113	115	130														
10503	-	-	-	-	154													
10504	-	-	-	-	-	160												
10505	-	-	-	-	-	-	172											
10506	-	-	-	-	-	-	-	178										
10507	-	-	-	-	-	-	-	-	182									
10508	-	-	-	-	-	-	-	-	-	188								
10603	-	-	-	-	157													
10604	-	-	-	-	-	167												
10605	-	-	-	-	-	-	173											
10606	-	-	-	-	-	-	-	179										
10607	-	-	-	-	-	-	-	-	183									
10608	-	-	-	-	-	-	-	-	-	189								
10700	-	-	-	-	-	-	-	-	-									

100XX = ND-500 STANDARD MULTIUSER MICROPROGRAM (ND-10332). PHASED OUT.
101XX = ND-500 MICROCODED ARRAY PROCESSOR FUNCTIONS (ND-10336). PHASED OUT.
102XX = ND-500 STANDARD MICROPROGRAM (ND-10332). PHASED OUT.

AVAILABLE MICROPROGRAMS:

103XX = ND-500/CX MICROPROGRAM (ND-10411).

104XX = ND-500 AX OPTION, ARRAY PROCESSING INSTRUCTION SET (ND-10338).

105XX = ND-500 STANDARD MICROPROGRAM (ND-10332).

106XX = ND-500/CX AND AX MICROPROGRAM (ND-10412).

107XX = ND-500 MTC OPTION MICROPROGRAM (ND-10069).

PART NO.	PRINT	CARD (ECO-LEVEL)
322501 C	-	001 010 042 082 085
322501 F	-	082 085
322504 C	-	004 030 145 163
322504 E	-	145 162
322505 D	-	008 031 034 039 049 063 066 067 077 081 101 106 117 132 +
322506 A	004 096 116	
322507 C	-	005 007 013 021
322508 D	-	015
322508 E	-	-
322509 C	-	016 024 038 164
322509 F	-	165
322511 C	-	
322512 C	-	002 017 069 159 161
322512 E	-	069 159 161
322513 D	-	046
322514 D	-	016
322514 E	-	-
322515 C	-	006 019 025 032 056 149
322515 H	-	150
322517 E	-	014 022 029 051 059 073 083 086 097 105 129 130 140 +
322517 G	-	047 052 059 073 084 091 097 105 129 130 140 +
322517 L	-	090 091 097 105 129 130 140 +
322517 P	-	111 129 130 140 +
322518 B	-	003 009 011 023 027 033 043 054 060 071 123 127 147 150 166
322518 K	-	060 074 124 126 148 150 166
322519 B	-	012 020 026 028 035 037 044 050 053 058 061 072 076 094 104 144 +
322519 M	-	060 075 076 094 104 144 +
322520 C	-	
322522 B	-	098 102 107 110 122 131 133 136
322522 E	-	121 122 131 133 136
322562 C	-	
322563 C	-	
322564 B	-	
322565 B	-	
322566 B	-	

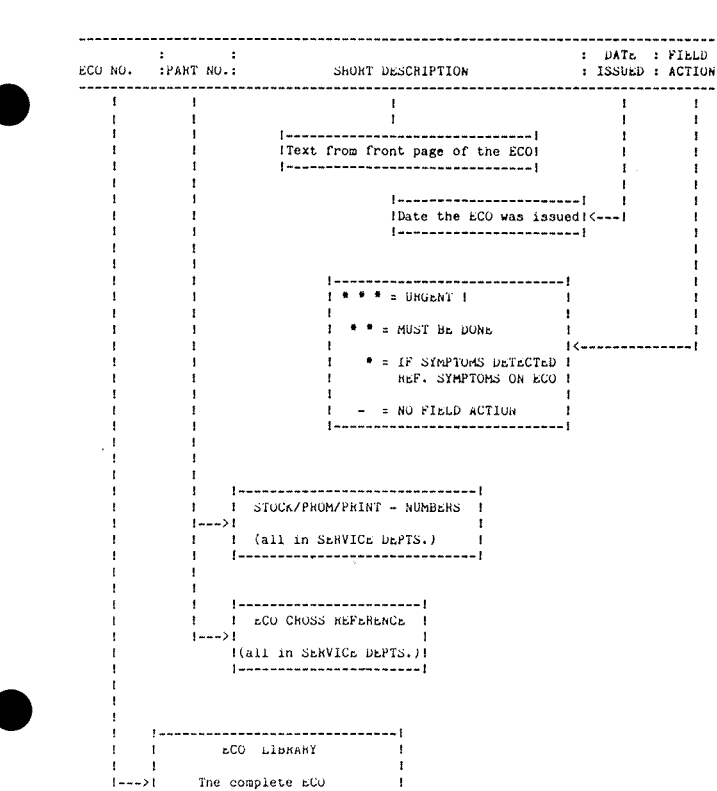
PART NO.	PRINT	CARD (ECO-LEVEL) U	V	W	X	Y	Z	BA	BB	BC	BD	BE	BF	BG	BH	BJ	BK	BL
322501	C																	
322501	F																	
322504	C																	
322504	E																	
322505	D	137																
322506	A																	
322507	C																	
322508	D																	
322508	E																	
322509	C																	
322509	F																	
322511	C																	
322512	C																	
322512	E																	
322513	D																	
322514	D																	
322514	E																	
322515	C																	
322515	H																	
322517	E	152																
322517	G	152																
322517	L	152																
322517	P	152																
322518	B																	
322518	K																	
322519	B	151																
322519	M	151																
322520	C																	
322522	B																	
322522	E																	
322502	C																	
322503	C																	
322504	B																	
322505	B																	
322506	B																	

PART NO.	PRINT	CARD (ECO-LEVEL) B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
322567	B	-																
322569	A	048 134																
322570	A	041 065 070 135																
322571	A	153																
322572	A																	
322573	B	-																
322574	B	-																
322580	A	040 103																
322581	A	036																
324156	C	- -																
324156	D	- - -																
324157	C	- -																
324157	D	- - -																
324159	A																	
324165	A																	
324201	A	045 055																
324201	C	- -																
324202	A																	
324303	C	- - 125																
324313	C	- -																
324315	A																	
324316	A																	
324411	A	139																
324411	B	-																
324412	A	141																
324413	A	140																
324413	B	-																
324414	A	141																
324441	B	- 142																
324441	C	- -																

ND-500 ECO CROSS REFERENCE
DATE: 850131

PART NO.	PRINT	CARD (ECO-LEVEL) B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
324442	B	-	143	109														
324443	B	-	143															
324444	B	-	143															

EXPLANATION



ECO NO.	PART NO.	Volume-1 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500-001 C	322501	Print errors. Design errors in address trap system.	810720	* *
500-002	322512	Print and design errors.	800820	* *
500-003 C	322510	Print and design errors.	810809	* *
500-004	322504	Fatal.	800915	* *
500-005	322507	Parity error.	800923	* *
500-006 B	322515	Design errors.	810529	* *
500-007	322507	Connection to indicator: Card active.	801027	* *
500-008	322505	a) Scratch-file failing. b) Write to memory failing.	810330	* *
500-009	322510	Design error in trap system.	801112	* *
500-010	322501	Design error in trap system.	801203	* *
500-011 B	322510	a) Bad synchronization in LOOP instruct. b) False indirect requests. c) Noisy BACLK.	810115	* *
500-012 B	322519	Design errors in trap system. Noise on ALTU-1, MIRPULS-1. Rev. B includes correction of AZ-1 generation and noise on MIRPULS-1.	810310	* *
500-013	322507	Delay of data enabling from cache to memory.	801217	* *
500-014 C	322517	Design errors. Print error.	810906	* *
500-015	322506	Reduction of noise w/boards on extender.	800105	* *
500-016	322509	Reduction of noise w/boards on extender.	800105	* *
500-017	322512	Design error. Logic diagram errors.	810107	* *
500-018	322514	Design error. Print errors.	810109	* *
500-019	322515	Design errors.	810130	* *
500-020 B	322519	Design errors. (Ref. ECO:500-001)	810202	* *
500-021	322507	Fatal.	810203	* *
500-022 B	322517	Design error.	810801	* *
500-023 B	322510	a) Marginal access time for mapping and prefetch PROM. b) Bad synchronization in LOOP instruct. c) Drawing error.	820920	* *
500-024	322509	Design error. Arrangement drawing error. Print error.	810310	* *
500-025	322515	Necessary for mem. management (PEOP-1 to trap info) and for BCD-arithm. (BCDDRY).	810327	* *
500-026 B	322519	a) Wrong program counter when async. DFAIL occurs together with after traps. (Ref. ECO:500-050.) b) Missing TSB fail.	810826	* *
500-027	322510	a) False illegal instruction trap. b) Wrong restart address after TSB-fault.	810423	* *
500-028	322519	Inhibit unknown traps and unwanted ATF when UTB=1. Inhibit SIT,BT when RETT. Invalid ATR, AZ.	810515	* *
500-029	322517	Design error.	810805	* *
500-030 B	322504	Wrong control if index adjust counters. Noise on: CSDAT01-1, CSDAT02-1, CSDAT03-1, CSDAT74-1.	810714	* *
500-031	322505	a) Trap-information missing. b) No cache-inhibit when "shared segm.". c) Print and logic diagram error.	810801	* *

ECO NO.	PART NO.	Volume-1 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500-032	322515	a) Inhibit destination clocks when trap branch. b) Too short loop counter clock.	810612	* *
500-033 B	322510	a) Drawing error. b) Marginal Timing. c) Delay line trouble. d) Missing PCCLK on trap. (Ref. ECO:500-035.) e) Missing ENT condition. (Ref. ECO:500-037.)	810916	* *
500-034	322505	Reduce hash-collisions.	810617	* *
500-035 B	322519	a) Missing PCCLK when trap. (ECO:500-033 has to be compleated first.) b) Problem with async.request. c) Marginal timing on address arithmetic when DPARG. d) Load UTB problem.	810624	* *
500-036	322501	Missing ENT-condition. (Ref. ECO:500-037)	810713	* *
500-037	322519	Missing ENT-condition. (ECO:500-033, 500-036 have to be compleated first.)	810713	* *
500-038	322509	Marginal timing with two shiftinstruct. in sequence. (Micro code)	810625	* *
500-039	322505	a) Segment no. missing in address limit check. (Ref. ECO:500-042.) b) Marginal timing.	810710	* *

ECO NO.	PART NO.	Volume-2 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500-040	322580	Segment no. missing in address limit cneck. (Ref. ECO:500-042.)	810714	* *
500-041	322570	Segment no. missing in address limit cneck. (Ref. ECO:500-042.)	810714	* *
500-042	322501	a) Segment no. missing in address limit cneck. (ECO:500-039, 500-040, 500-041 or 500-040, 500-04o have to be compleated first. b) Noisy BSEL.	810803	* *
500-043	322510	a) CJP-AFIN synchronization problem. b) Prefetch clock adjustment. c) AFIN reset problem.	810804	* *
500-044	322519	TSBFLAG reset too early.	810731	* *
500-045	324201	Print errors.	810724	* *
500-046	322513	a) Segment no. missing in address limit cneck. (Ref. ECO:500-042.) b) Design errors. c) Print errors.	810731	* *
500-047 B	322517	Design error. Print error.	820506	* *
500-048	322569	Missing sign extension for index scaling datatype bit.	810806	* *
500-049	322505	Noise on IHC-0. Noise on FSA2A-1.	810816	* *
500-050	322519	Wrong program counter when async. DFAIL occurs together with after traps. (Continuation of ECO:500-020 REV. B.)	810903	* *
500-051	322517	a) Critical timing "Clear-clock" on MRO flip-flop. (New revision C of ECO:500-014); b) False setting of FAS2-1, when ILA-0 low. c) Noise on PREQ-0.	810910	* *
500-052	322517	a) Critical timing "Clear-clock" on MRO flip-flop. b) False setting of FAS2-1, when ILA-0 low. c) Noise on PREQ-0.	810910	* *
500-053	322519	a) Marginal NPCK-1. b) Noise on ITRP-0. c) Missing ATR after DFAIL. d) Trace-bits must be ignored after RETT.	810917	* *
500-054	322510	Marginal clocking RETT. (New revision B of ECO:500-033.)	810921	* *
500-055	324201	Wrong EXT signal delays control store signals.	810929	* *
500-056	322515	False power failure.	811001	* *
500-057	048XX	New PROM-version.	811014	* *
500-058	048XX			
500-059	322519	a)Marginal timing on address arithmetic when DPARG.(New revision B of ECO:500-035); b)Marginal ZL-0. c)BCD illegal code as test condition. d)Wrong PC when DE trap.	811110	* *
500-059	322517	Puls too short, destroied in delay line.	811110	* *
500-060 B	322510	Marginal clocking of PICLK1-1.	811220	* *
500-061	322519	a)Marginal address arith when DPARG. b)False index scaling error.(Continuation of ECO:500-020 REV.B.)	811116	* *
500-062	048XX	a)Extra cycle in RIOM.(8K u-prog. version 5 and up.) b)Missing ENT-condition.(8K u-prog. version 1 and up.) c)Type check N for CALL,CALLG. Wrong ENTB operand. d)Glitch on DPDIR, may destruct start address in DP.	811110	* *
500-063	322505	Marginal address timing	811116	* *

ECO NO.	PART NO.	Volume-2 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500-064	322500	Print errors.	811117	
500-065	322570	Only valid for computer with 1/4 cache.	811123	
500-066	322505	Noise on FAS2A-1. Symptoms: Hangup on cache control with CPU request on.	811201	*
500-067	322505	Hardware modifications to change use of segment numbers. Segment zero is not current segment. (Microprogram no.15 must be used. a)"Segment zero detect"(SEG2) removed. b)"Segment not equal detected" (SEGEQ-0)removed. Multi segment software and Sintran level 6 must also be installed:	811210	*
500-068	322519	a)Marginal address arith when DPARG. b)False index scaling error. c)Print error:	820104	* *
500-069 B	322512	Dummy upgrading of version. (Ref. ECO:500-161).	830614	
500-070	322570	Stand-by power to ND-500 MANAGEMENT.	811221	* *
500-071	322516	a)Bad delay-line in pos.1B. (Error in ECO:500-023). b)Noise on AMICK-1.	811229	* *
500-072	322519	a)Data request aborted by request stop (DRQSTP). (Error in ECO:500-012) b)Missing: S2-clock when D,S2.	820104	* *
500-073	322517	a)Modification on LOCK signal. Read request must be sent only to addressed channels when LOCK is on. (Error in ECO:500-029/500-047) b)Arrangement error. Effect only machines with new MPM 4.	811230	*
500-074	322516	a)Bad delay-line in pos. 1b. b)Noise on AMICK-1.	820115	* *
500-075	322519	a)Data request aborted by request stop (DRQSTP). b)Missing S2-clock when D,S2.	820113	* *
500-076	322519	Insufficient info about concurrent IFAIL and DFAIL in LOOP-instruction.(Detected in: SUPER). Must be done together with patch in mic.prog 15. Lock:11265/Remove B,BM 10 insert B,BM 14.	820120	* *
500-077	322505	Arrangement drawing error.	820119	* * *
500-078	100XX	This change avoids a 'TRAP HANDLER MISSING' message when a strap handler for PROTECT VIOLATION should be entered.	820125	*
500-079	100XA	This changes corrects a wrong P-register after page-faults in LOOP-instruction. (ECO:500-078 has to be compleated first).	820125	*
500-080	100XX	This changes delays the instruction-don't-use-signal until the instruction memory is ready. The errormessage was "Cache parity error on program channel.	820127	* *
500-081	322505	a)TSB-fault test failing. Critical timing. hang up in memory management. Data request hang up. b)Puls from delayline too short. (LACL-1) wrong address strobing.	820204	* *
500-082	322501	Too short holdtime on operandlatch when using scratchregister as operand. Symptoms: Test y in Memic may give an uncorrect errormessage.	820209	*

ECO NO.	PART NO.	Volume-2 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500-083	322517	Cache parity error disabled when cache not used. Inhibit cache parity error when "dont't use cache"(DUS) is set.	820216	*
500-084 B	322517	Cache parety error disabled when cache not used. Inhibit cache parety error when "don't use cache"(DUS) is set.	820506	*
500-085	322501	Test 5 in Extra gives wrong P-reg. (Arrangement drawing error.)	820216	*
500-086	040XX	These opcode mapping proms include Fortran library instructions and BCD-instructions (Ref.ECO:500-087)	820222	
500-087	039XX	These opcode mapping proms include Fortran library instructions and BCD-instructions. (ECO:500-086 has to be completed first.)	820222	
500-088	322517	Wrong error message from SINTRAN. "Block" not set. Critical timing.(Error in ECO:500-022). Gives out the error message. "Hardware fault on Prog./Data channel".	820306	*
500-089	100XX	Should be done together with ECO:500-086, 500-087.	820304	
500-090	322517	a)Cache parety error disabled when cache not used. Inhibit cache parety error when "don't use cache"(DUS) is set. b)Print error.	820310	*
500-091	322517	Wrong error message from SINTRAN. "Block" not set. Critical timing. Gives out the error message. "Hardware fault on Prog./ Data channel".	820310	*
500-092	101XX	a)Prevent ND-500 from stopping when a trapping instruction address and its local trap handler instruction address hashes to the same TSB-index. b)Corrects overflow handling for the array processing function: NDFPCV.	820315	*
500-093	102XX	Prevents ND-500 from stopping when a trapping instruction address and its local handler instruction address hashes to the same TSB-index.	820315	*
500-094	322519	Marginal setting of DFAIL when WFMEM turns off. Errormessage in Trap micro-test.	820320	*
500-095	101XX	a)To correct error and invalid operation detection in the instruction ALOG,ALOG2 and ALOG10. b)To correct error in addressing the operands in case that result of an operation is to be written back to the first operand and second or later operand is addressed through a descriptor.	820331	* *

ECO NO.	PART NO.	Volume-2 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500-096	102XX	a)To correct error and invalid operation detection in the instructions ALOG,ALOG2 and ALOG10. b)To correct error in addressing the operands in case that result of an operation is to be written back to the first operand and second or later operand is addressed through a descriptor.	820331	* *
500-097	322517	False write signals to CACHE MODULE when new MEMORY MANAGEMENT(5022) is used.	820423	*
500-098	322522	a)Critical write timing for WIP table (written in page table). b)False ATOK signal when sequencial TSB is used.	820429	* *
500-099	322500	Lock signal floating on CACHE MODULE, this may cause noise on Memory Lock signal when not used.	820430	*

ECO NO.	PART NO.	Volume-3 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500-100	040XX	Error in FREEB.	820505	*
500-101	322505	Critical timing in clear TSB. Too short write pulse. GMENT failing.	820513	*
500-102	322522	Critical timing in clear TSB. Too short write pulse. GMENT failing.	820513	*
500-103	322500	Segment number included in AZ-detection. (Ref. ECO:500-104)	820518	
500-104	322519	Segment number included in AZ-detection. (ECO:500-103 has to be completed first).	820518	
500-105	322517	Error in ECO:500-083,500-084,500-090.	820602	* *
500-106	322505	Modification to stop oscillations in delay-line 5H. Oscillation may occure after power off. GMENT fails in TEST 4, GMOFF fails in TEST 7.	820607	*
500-107	322522	Modification to stop oscillations in delay-line 5H. Oscillation may occure after power off. GMENT fails in TEST 4, GMOFF fails in TEST 7.	820608	*
500-108	038XX	The PROM used for correction/rounding in Divide instructions is changed to give a statistical better result. Should be done together with ECO:500-109 or 500-110.	820618	*
500-109	101XX	Updated according to new edition of the ND-500 Reference manual (ND-05.009.02). Affected instructions: LOOP1, LOOPD, LOOP and all string instructions. Error correction for integer divide. Some new functions are implemented: SVEMGXX, SVESQXX, VMEGXXX, VSQXXXX, VSWAPXX, CFFTXXX, RFFTXXX. Should be done together with ECO:500-106.	820618	*
500-110	102XX	Updated according to new edition of the ND-500 Reference manual (ND-05.009.02). Affected instructions: LOOP1, LOOPD, LOOP and all string instructions. Error correction for integer divide. Should be done together with ECO:500-106.	820618	*
500-111	322517	Error in previous ECO. (ECO:500-090)	820629	* *
500-112	104XX	Error correction for the instruction ACOS with argument equal to 0.0 and the instruction ATAN2.	820629	*
500-113	105XX	Error correction for the instruction ACOS with argument equal to 0.0 and the instruction ATAN2.	820629	*
500-114	104XX	Avoid 'DATA MEMORY REFERENCE NOT FINISHED'-message when writing on the instruction channel.	820714	*
500-115	105XX	Avoid 'DATA MEMORY REFERENCE NOT FINISHED'-message when writing on the instruction channel.	820714	*
500-116	322506	Critical timing, parity check. (Arrangement drawing error).	820820	
500-117	322503	Critical timing, read scratch.	820820	
500-118	322522	Critical timing, read scratch.	820820	
500-119	040XX	Error in three-operand BCD-instructions. In connection with BCD Arithmetic in ND 500-CE.	820820	

ECO NO.	PART NO.	Volume-3 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500-120	104XX	New floppy-disc 103360.	821007	*
500-121	322522	Dummy upgrading of version. (Ref. ECO:500-116).	820823	
500-122	322522	a)Write error in "page used" table. b)Critical timing,spike on "ATOC-0" signal to Cache Control.	820825	* *
500-123 B	322510	Release of gate. The loss of meaning is caused by ECO:500-127.	821010	*
500-124 B	322510	Dummy upgrading of version. (Ref. ECO:500-120).	821010	*
500-125 B	324303	Test program BCD-EXERCISER failing: a) In instruction WPCONV. b) Several instructions (Status ZERO). c) Value of capacitor C3 is dependent of cycle length appr. 175nS between positive edges of BCDCLK-1.Ref.:Eng.Spec.No.:P03-074:	840104	* *
500-126	040XA	Ref. ECO:500-127, ECO:500-128.	821010	*
500-127 C	322510	AFIN IS RESET IN GO instruction if the instruction before is store and gives DFAIL. This gives noise on MIRCLK. Sumptom:Data memory ref. not finished microprogram stop address:11202. (new revision B of ECO:500-023 and ECO:500-123): (ECO:500-126 has to be compleated first).	821201	*
500-128	322510	AFIN IS RESET IN GO instruction if the instruction before is a store and gives DFAIL. This gives noise on MIRCLK. Symptom:Data memory ref. not finished microprogram stop address:11202. (New revision B of ECO:500-124). (ECO:500-126 has to be compleated first).	821010	*
500-129	322517	a)Too short "Write puls" for "Chache used bits". b)Memory parety error when "LOC" signal to memory used(TSET instruction).	821020	*
500-130	105XA	New floppy-disc 103320.	821007	*
500-131	322522	Power-fail does not work.	821007	*
500-132	322505	Modification to inhibit trap from Memory Management when paging off.	821025	*
500-133	322522	a) Parity error from TSB-table. b) Modification to inhibit trap from Memory Management when paging off.	821025	*
500-134	322509	Missing connections in wrapped backwiring. Has to be done when MPM-4 is used. (TSET instruction does not work).	821027	*
500-135	322570	Missing connections in wrapped backwiring. Has to be done when MPM-4 is used. (TSET instruction does not work).	821027	*
500-136	322517	"TESET" instruction must give "write-protect trap" in read cycle when page is write-protected. (Ref. ECO:500-137, 500-130).	821110	*
500-137	322505	"TESET" instruction must give "write-protect trap" in read cycle when page is write-protected. (ECO:500-130 has to be completed first).	821110	*

ECO NO.	PART NO.	Volume-3 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500-136	322522	"TEST" instruction must give "Write-protect trap" in read cycle when page is write-protected. (ECO:500-136 has to be completed first).	821117	*
500-139 B	324411	Segment number included in AZ-detection. (Ref. ECO:500-104)	830505	
500-140 B	324413	Print error.	830505	
500-141	324412	Dummy upgrading of version.	821202	
	324414	(Ref.ECO:500-139,500-140)		
500-142 C	324441	Segment number included in AZ-detection. (Ref.ECO:500-104)	831005	*
500-143	324442	Dummy upgrading of version.	821202	
	324443	(Ref.ECO:500-142)		
	324444			
500-144	322519	Marginal timing between AFADO-2 and XDH3 causing false MPC pulse. Failing in after trap. Symbol: Modul TRAP-1 and EMBE-ENTT is failing with trapped P equal to PC.	820103	*
500-145	322504	Noise on BEXR-0 causing fatal trap to micro addr. 024. Symptom: Timeout MICRO P:37777.	821215	*
500-146	322517	Marginal timing when read status after cache clear. Symptom: Failing in cache clear test in GMENT.	821215	*
500-147	322510	Too small TAS-0 pulse.	830106	*
500-148	322518	Too small TAS-0 pulse.	830106	*
500-149	322515	Noise on PWRFAIL-0 when powerfail on ND-500. (ECO:500-151 must also be done).	830125	*

ECO NO.	PART NO.	Volume-4 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500-150	322515	Noise on PWRFAIL-0 when powerfail on ND-500. (ECO:500-151 must also be done).	830125	*
500-151	322519	a)Marginal clocking of EOP in TRAPINFO register.Symptom:Modul TRAP-N-0 in Des-modul is failing. b)Noise on PWRFAIL-0 when powerfail on ND-500.(ECO:500-149 or 500-150 must also be done.	830125	*
500-152	322517	Spikes on IMC-0. Module float-comp in desmodule is failing.	830302	*
500-153	322571	Remove 10nF capacitor.	830223	
500-154	105XX	New floppy-disc 103326. Error correction for D FCONV, D LOOP, JUMPG DESC(xxx)(Wn), and improved accuracy for F SIN and F COS. New version of module JUMPER in ND-500 verification system is required.	830317	
500-155	104XX	New floppy-disc 103360. Error correction for D FCONV, D LOOP, JUMPG DESC(xxx)(Wn), and improved accuracy for F SIN and F COS. New version of module JUMPER in ND-500 verification system is required. Array processing function CONVXXX may be called without causing timeout in ND-500.	830317	
500-156	103XX	New floppy-disc 104116. Error correction for D FCONV, D LOOP, JUMPG DESC(xxx)(Wn), and improved accuracy for F SIN and F COS. New version of module JUMPER in ND-500 verification system is required.	830317	
500-157	100XX	New floppy-disc 104126. Error correction for D FCONV, D LOOP, JUMPG DESC(xxx)(Wn), and improved accuracy for F SIN and F COS. New version of module JUMPER in ND-500 verification system is required. Array processing function CONVXXX may be called without causing timeout in ND-500.	830317	
500-158	322510	Timing problems with PCD on Slice. Too short holdtime. Possible error message: "Protect violation".	830502	*
500-159	322512	TIME-OUT. Control store parity microp. 11202. Noise on CSDAT 104/105.	830531	*
500-160	------	Withdrawn.	830622	
500-161	322512	Glitches on ADR-signals. Causes impossible to terminate ND-500 with stop reason; "Data memoryreference not finished or Prefetchpros. not finished". (New revision of ECO:500-069).	830613	*
500-162	322504	Silk-screen error. Decoupling capacitor 10nF placed on input-signal to IC 1163 may be fatal. Possible error-symptom: Failing in SLICE test No.: 13.	830622	*
500-163	322504	Dummy upgrading of version. (Ref. ECO:500-162).	830621	

ECO NO.	PART NO.	Volume-4 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500-164	103XX	Temporary failing in ENTM,ENTB,SETE,CLTE and for Dn SIN and Dn COS. New version of Test-programs required for TRAP-N-1, TRAP-N-5 and TRAP-N-7. Version 830530 of ND-500 Verification Program is required.	830622	*
500-165	104XX	Temporary failing in ENTM,ENTB,SETE,CLTE and for Dn SIN and Dn COS. New version of Test-programs required for TRAP-N-1, TRAP-N-5 and TRAP-N-7. Version 830530 of ND-500 Verification Program is required.	830622	*
500-166	105XX	Temporary failing in ENTM,ENTB,SETE,CLTE and for Dn SIN and Dn COS. New version of Test-programs required for TRAP-N-1, TRAP-N-5 and TRAP-N-7. Version 830530 of ND-500 Verification Program is required.	830622	*
500-167	106XX	Temporary failing in ENTM,ENTB,SETE,CLTE and for Dn SIN and Dn COS. New version of Test-programs required for TRAP-N-1, TRAP-N-5 and TRAP-N-7. Version 830530 of ND-500 Verification Program is required.	830622	*
500-168	322510	Marginal timing between TYPCK and PCSD01 due to faster proms(20S42) of prefeton and BCU:500-150. Symptoms: Calculated results in SUPER are wrong.	830706	*
500-169	324442	Missing MACL to BCD.	831005	*
500-170	103XX	Main reason is to implement XMESSAGE in the ND-500.	840110	
500-171	104XX	Main reason is to implement XMESSAGE in the ND-500.	840110	
500-172	105XX	Main reason is to implement XMESSAGE in the ND-500.	840110	
500-173	106XX	Main reason is to implement XMESSAGE in the ND-500.	840110	
500-175	040XX	Error in FREEBUDDY. Bankbitt missing in location 452 (oct.).	840209	*
500-176	103XX	Corrected error in Fn SIN and Fn COS.	840206	*
500-177	104XX	Corrected error in Fn SIN and Fn COS.	840209	*
500-178	105XX	Corrected error in Fn SIN and Fn COS.	840209	*
500-179	106XX	Corrected error in Fn SIN and Fn COS.	840209	*
500-180	103XX	Incorrect results in Fn SIN, Fn COS, Fn ASIN and Fn ACOS. Unexpected DE trap conditions may occure. New version 10500.	840321	*
500-181	104XX	Incorrect results in Fn SIN, Fn COS, Fn ASIN and Fn ACOS. Unexpected DE trap conditions may occure. New version 10500.	840321	*
500-182	105XX	Incorrect results in Fn SIN, Fn COS, Fn ASIN and Fn ACOS. Unexpected DE trap conditions may occure. New version 10500.	840321	*
500-183	106XX	Incorrect results in Fn SIN, Fn COS, Fn ASIN and Fn ACOS. Unexpected DE trap conditions may occure. New version 10500.	840321	*

ECO NO.	PART NO.	Volume-4 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500-104	322509	Marginal timing.	841016	
500-105	322509	Marginal timing.	841018	
500-106	103XX	If DFAIL when fetching index in a Loop instruction gives IFAIL the IFAIL will be ignored.Symptom: Illigal instruction code. When setting the commonol COMMON-VARIABLE in Fortran compiler to ON this patch must be done. This is default in Fortran-500 version I.	850130	*
500-107	104XX	If DFAIL when fetching index in a Loop instruction gives IFAIL the IFAIL will be ignored.Symptom: Illigal instruction code. When setting the commonol COMMON-VARIABLE in Fortran compiler to ON this patch must be done. This is default in Fortran-500 version I.	850130	*
500-108	105XX	If DFAIL when fetching index in a Loop instruction gives IFAIL the IFAIL will be ignored.Symptom: Illigal instruction code. When setting the commonol COMMON-VARIABLE in Fortran compiler to ON this patch must be done. This is default in Fortran-500 version I.	850130	*
500-109	106XX	If DFAIL when fetching index in a Loop instruction gives IFAIL the IFAIL will be ignored.Symptom: Illigal instruction code. When setting the commonol COMMON-VARIABLE in Fortran compiler to ON this patch must be done. This is default in Fortran-500 version I.	850130	*

NEC-8000

PART/PROM/PRINT - NUMBERS CROSS REFERENCE

LIST 1. PART NUMBERS RELATED

LIST 2. PROM NUMBERS RELATED

LIST 3. PRINT NUMBERS RELATED

ISSUED BY: TECHNICAL INFORMATION GROUP

REVISED: 850206

LIST 1. PART NUMBERS RELATED

PART No.	NAME	PRINT	PROM
322501	CPU-SLICE	5001	-
322502	CONTROL STORE	5002	049XX
322504	SEQUENCER	5004	039XX 042XX 043XX
322505	MEMORY MANAGEMENT (1. Version)	5005	-
322506	CACHE MODULE (2. Version)	5006	032XX
322507	CACHE (1. Version)	5007	032XX
322508	ARITHMETIC 1	5008	036XX 037XX
322511	ARITHMETIC 3	5011	033XX
322512	CONTROL I	5012	040XX 041XX
322513	ADDRESS DRIVER	5013	-
322514	ARITHMETIC 4	5014	-
322515	CONTROL II	5015	-
322517	CACHE CONTROL	5017	051XX
322518	PREFETCH	5018	044XX 045XX 046XX 047XX 048XX
322519	TRAP	5019	050XX
322520	4K CS RAM	5020	049XX
322522	MEMORY MANAGEMENT (2. Version)	5022	-
322560	FAN POWER DISTRIBUTION	5201	-
322561	N500 ADAPTER	5202	-
322562	N500 DATA ADAPTER	5203	-
322563	N500 ADDRESS ADAPTER	5204	-
322564	CACHE TERMINATION	5205	-
322565	TERMINATION A5	5206	-
322566	TERMINATION B5	5207	-
322567	TERMINATION B10	5208	-
322569	N500 BACKWIRING B (and list)	5301	-
322570	N500 BACKWIRING D (and list)	5301	-
322572	REDUCED EXTENSION CARD	5211	-
322571	PANEL CONTROL N500	1981	-
322573	ND-500 DATA ADAPTER	5213	-
322574	ND-500 ADDRESS ADAPTER	5214	-
322579	N500 EXTENSION CARD	5200	-
322580	N500 BACKWIRING A (and list)	5301	-
322581	N500 BACKWIRING C (and list)	5302	-
322622	N500 INTERFACE	3022	054XX
322787	BMPM-N500 MEMORY 1	1975	-
322789	BMPM-N500 MEMORY 2	1976	-
324156	N500 DATA ADAPTER (F16 Version)	5203	-
324157	N500 ADDRESS ADAPTER (F16 Version)	5204	-

LIST 1. (CONT.). PART NUMBERS RELATED

PART No.	NAME	PRINT	PROM
324159	8K CS RAM	5402	059XX
324165	MEMORY CHANNEL DRIVER	5116	-
324201	8K CS RAM	5401	059XX
324202	16K CS RAM	5402	-
324303	BCD	5103	076XX 077XX 078XX 079XX 080XX 081XX 082XX 083XX 084XX
324315	TIMER AND INTERRUPT	5115	301XX
324316	CACHE MODULE	5116	-
324411	ND-500-BW-A	5311	-
324412	ND-500-BW-B	5312	-
324413	ND-500-BW-C	5313	-
324414	ND-500-BW-D	5314	-
324422	DUAL MPM5 A	5322	-
324433	DUAL MPM5 B	5333	-
324434	DUAL MPM5 D	5334	-
324441	ND-500-M-BW-A	5341	-
324442	ND-500-M-BW-B	5342	-
324443	ND-500-M-BW-C	5343	-
324444	ND-500-M-BW-D	5344	-

LIST 2. PROM NUMBERS RELATED

PROM	NAME	PRINT	PART
032XX	500-CACHE	5006	322506
		5007	322507
033XX	MULTIPLY ADDER	5011	322511
036XX	DATA DISABLE	5008	322508
037XX	DEVIDE TABLE	5008	322508
039XX	MAIN PROC. OPCODE MAP	5004	322504
040XX	SIGN EXTENSION CONTROL	5012	322512
041XX	OR LOGIC PROMS	5012	322512
042XX	SPECIAL ENTRY POINTS	5004	322504
043XX	DESCRIPTOR SCALING	5004	322504
044XX	VALID BYTES CONTROL	5018	322518
045XX	OPERAND SPECIFIER DECODE	5018	322518
046XX	PREFETCH MAPPING	5018	322518
047XX	OPERAND CONTROL	5018	322518
048XX	PREFETCH CONTROL	5018	322518
049XX	CSA DECODE 1	5002	322502
		5020	322520
050XX	SCALE ERROR	5019	322519
051XX	CACHE CONTROL	5017	322517
054XX	N500-INTERFACE	3022	322622
059XX	CSA-DECODE-8K	5401	324201
		5402	324159
076XX	BCD-ADD	5103	324303
077XX	BCD-PACK	5103	324303
078XX	BCD-UPACK1	5103	324303
079XX	BCD-UPACK2	5103	324303
080XX	BCD-MULTL2	5103	324303
081XX	BCD-SIGN-DECODE	5103	324303
082XX	BCD-MULTMDECODE	5103	324303
083XX	BCD-MICRO-PROG	5103	324303
084XX	BCD-MASK-DECODE	5103	324303
301XX	INSTRUCTION DECODE	5115	324315

LIST 3. PRINT NUMBERS RELATED

PRINT	NAME	PART No.	PROM
1975	BMPM-N500 MEMORY 1	322787	-
1976	BMPM-N500 MEMORY 2	322789	-
1981	PANEL CONTROL N500	322571	-
3022	N500 INTERFACE	322622	054XX
5001	CPU-SLICE	322501	-
5002	CONTROL STORE	322502	049XX
5004	SEQUENCER	322504	039XX
			042XX
			043XX
5005	MEMORY MANAGEMENT (1. Version)	322505	-
5006	CACHE MODULE (2. Version)	322506	032XX
5007	CACHE (1. Version)	322507	032XX
5008	ARITHMETIC 1	322508	036XX
			037XX
5011	ARITHMETIC 3	322511	033XX
5012	CONTROL I	322512	040XX
			041XX
5013	ADDRESS DRIVER	322513	-
5014	ARITHMETIC 4	322514	-
5015	CONTROL II	322515	-
5017	CACHE CONTROL	322517	051XX
5018	PREFETCH	322518	044XX
			045XX
			046XX
			047XX
			048XX
5019	TRAP	322519	050XX
5020	4K CS RAM	322520	049XX
5022	MEMORY MANAGEMENT (2. Version)	322522	-
5103	BCD	324303	076XX
			077XX
			078XX
			079XX
			080XX
			081XX
			082XX
			083XX
			084XX
5115	TIMER AND INTERRUPT	324315	301XX
5116	MEMORY CHANNEL DRIVER	324165	-
5116	CACHE MODULE	324316	-
5200	N500 EXTENSION CARD	322579	-
5201	FAN POWER DISTRIBUTION	322560	-
5202	N500 ADAPTER	322561	-
5203	N500 DATA ADAPTER	322562	-
5203	N500 DATA ADAPTER (F16 Version)	324156	-
5204	N500 ADDRESS ADAPTER	322563	-
5204	N500 ADDRESS ADAPTER (F16 Version)	324157	-
5205	CACHE TERMINATION	322564	-
5206	TERMINATION A5	322565	-
5207	TERMINATION B5	322566	-
5208	TERMINATION B10	322567	-
5211	REDUCED EXTENSION CARD	322572	-

LIST 3. (CONT.). PRINT NUMBERS RELATED

PRINT	NAME	PART No.	PROM
5213	ND-500 DATA ADAPTER	322573	-
5214	ND-500 ADDRESS ADAPTER	322574	-
5301	N500 BACKWIRING A (and list)	322580	-
5301	N500 BACKWIRING B (and list)	322569	-
5301	N500 BACKWIRING D (and list)	322570	-
5302	N500 BACKWIRING C (and list)	322581	-
5311	ND-500-BW-A	324411	-
5312	ND-500-BW-B	324412	-
5313	ND-500-BW-C	324413	-
5314	ND-500-BW-D	324414	-
5322	DUAL MPMS A	324422	-
5333	DUAL MPMS B	324433	-
5334	DUAL MPMS D	324434	-
5341	ND-500-M-BW-A	324441	-
5342	ND-500-M-BW-B	324442	-
5343	ND-500-M-BW-C	324443	-
5344	ND-500-M-BW-D	324444	-
5401	8K CS RAM	324201	059XX
5402	8K CS RAM	324159	059XX
5402	16K CS RAM	324202	-

TABLE OF CONTENTS

INSTRUCTION DECODE 512 x 4 PAL

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
30100	18																							
ECO 500-																								

III-7-6-19

ID NO 324.315

Corrected	Date	Sign
ND-500 MICROPROGRAM REGISTRATION SHEET STANDARD A	Print no / Scale 5115	Drawn DF 29.04.83
		Contr SM
		Page of
		Replacement for
NORSK DATA A.S Oslo, Norway		Replaced by

BCD - ADD (512 × 8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
07600	*																							
ECO 500-																								

* 1H, 3H, 5H, 7H, 9H, 10H, 11H, 12H, 9G, 9F, 10F, 11F, 12F, 13F, 14F, 15F, 17E

BCD - PACK (512 × 8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
07700	*																							
ECO 500-																								

* 2H, 4H, 6H, 8H, 19F, 20F, 21F, 22F

BCD - UPACK1 (512 x 8PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
07800	*																							
ECO 500-																								

* 9D, 11D, 13D, 15D

III-7-6-20

TD NO 324318

Corrected | Date | Sign

ND-500 MICROPROGRAM REGISTRATION SHEET STANDARD A

Print no / Scale 5118

Drawn TRo 23 11 82

Contr.

Page 1 of 3

Replacement for

NOR[illegible]A A.S Oslo[illegible]way

Replaced by

BCD - UPACK [illegible] x 8PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
07900	*																							
ECO 500-																								

*19H, 20H, 21H, 22H

BCD - SIGN - DECODE (1K x 4PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
08100	23C																							
ECO 500-																								

BCD - MICROPROGRAM (512 x 8PROM) *

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
08300	25F																							
08301	27F																							
08302	29F																							
08303	30F																							
08304	32F																							
08305	28H																							
08306	27H																							
08307	29H																							
08308	30H																							
08309	33H																							
08310	34H																							
ECO 500-																								

*08309 & 08310 ARE WITHOUT LATCH
THE REST ARE WITH LATCH

III-7-6-21

TD NO 324318

Corrected	Date	Sign
ND-500 MICROPROGRAM REGISTRATION	Print no / Scale 5118	Drawn TERO 23.11.84
SHEET STANDARD A		Contr.
		Page 2 of 3
		Replacement for
NORSK DATA A.S Oslo, Norway		Replaced by

BCD - MASK - DECODE (256 x 8PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 8 4 0 0	19A																							
0 8 4 0 1	20A																							
ECO 500-																								

BCD - MULTM (1024 x 4PROM M/LATCH)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 7 0 0 0	1G																							
3 7 0 0 1	2G																							
3 7 0 0 2	3G																							
3 7 0 0 3	4G																							
3 7 0 0 4	5G																							
3 7 0 0 5	6G																							
3 7 0 0 6	7G																							
3 7 0 0 7	8G																							
ECO 500-																								

BCD - MULTL (1024 x 4PROM M/LATCH)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 7 1 0 0	*																							
ECO 500-																								

* 1F, 2F, 3F, 4F, 5F, 6F, 7F, 8F

III-7-6-22

ID NO 324318

Corrected	Date	Sign
ND-500 MICROPROGRAM REGISTRATION SHEET STANDARD A	Print no / Scale 5118	Drawn TRo 23 11 84
	Contr	
	Page 3 of 3	
NOR[illegible]A A.S	Replacement for	
	Replaced by	

ND500 TEST PROGRAMS

MICRO TEST PROGRAMS

Ref: ND500 Test Micro Program Description Manual ND-30.013.
Diskette: 10321 Part 1-5.

The micro test programs may be run in three different ways:

- Stand alone.
- One by one with SINTRAN
  The Micro Testprograms are loaded as RT programs from user ND500-MICRO-TEST. The Micro testprograms can be started from any terminal by using the program STMIC from user RT. Remember to load the Control Store after initial load of the system before running any micro testprograms as RT programs. Else the reserving of any memory will fail in the initializing of the testprogram.
- All programs in sequence with SINTRAN.
  This can be done with another RT program called HAREM.

In every Micro testprogram there is a user micro program.
It makes it possible for the user to create, modify and start his own micro program.

COMTE: ND100/ND500 COMMUNICATION TEST PROGRAM

COMTE tests the communication between ND100 and ND500.
The first 39 routines are not micro programmed. They just use IOX instructions from the ND100, the ND500 is passive.
From test 40 the communication is testet from ND500.
If the program runs under SINTRAN, it will reserve the ND500 and possibly some memory (COMTE needs no ND500 memory).
The program ask for maximum control store address. If the answer is 0 the micro program loops will not be used.
Maximum control store address is 20000.
Minimum control store address is 0.
In the program there are some test routines and verification routines.

The verification routines test the following:

- Test 23 - 29 verify the ND500 Interface board.
- Test 30 - 36 verify the ND500 Interf, different registers on Control 2 board.
- Test 37 - 39 verify the ND500 Interf, registers on Control 2, Control Store board.
- Test 40 - 49 verify the ND500 Interf, Control 2, Control store board, sequensing logic on Sequencer.

SLICE: ND500 SLICE TEST PROGRAM

SLICE tests the ND500 slice and sequencing.
Tests the single step, sequencing trough single stepping, bit mask, ALU functions, registers on SLICE boards, loop counter on Control 1 board.

ARITH: ND500 EXTERNAL ARITHMETIC TEST PROGRAM

ARITH tests the external arithmetic. It does this by loading small micro programs that shift logical, arithmetical and rotational. They also do floating add, subtract, multiply and divide.
ARITH tests the Arith 1, Arith 2, Arith 3 and Arith 4.
Some functions on the Slice, Control 2, Sequencer.

MEMIC: ND500 CACHE AND MEMORY TEST PROGRAM

MEMIC tests the ND500 memory and cache. There are two channals, one for data and one for instructions.
MEMIC can verify both cache and memory, only cache or only memory. It may run with memory management on, or off, or without memory management. The memory configuration of a system may be checked by the stand alone testprogram MPEST.
MEMIC asks for the last and the first memory address. Memory addresses occupy 25 bits. Memic will set the two last bits in the address to zero, to get addresses in word boundary. If the last address are given as 0, the memory for this channel will not be tested.
MEMIC asks for the number of cache modules for the channal. If the answer is 1,2 or 4, Memic will print the corresponding last cache address.
If it is a ND520 and ND550/CX the answer should always be 0. If the answer is 0 the cache memory for this channal will not be tested. The program will set the don't-use-cache bit in the memory modus register.
Memic asks whether the program is to be run without MMS or not. If MMS it asks if the MMS is to be on or off. After this question an initiation micro program is run. It will clear the cache, set up some registers, and if the MMS is on, fill the TSB. If the memory specified is bigger than the TSB the program will change the last memory address for the channal. The TSB can contain 1377 pages (oct), that means MEMIC can not test more memory than 1377 pages = 1 1/2 Mbyte with MMS on.
MEMIC asks whether the tests 4 to 7 should check memory and cache parity or not. If the answer is Y, the memory status registers will be read and checked for every memory read. The IR register will not be used when parity checking.

Test 3 verify address arithmetic on the Slice module.

MEMIC verify the MMS card, Cache module, Cache Control, MPM ports for ND500 and Memory system, memory control logic on Trap card.

GMOFF: ND500 MEMORY MANAGEMENT OFF TEST PROGRAM.

GMOFF tests the MMS with the MMS turned off.
GMOFF ask for the same parameters as for MEMIC.
GMOFF tests WIP buffer, PGU buffer, Scratch file for data and instruction channal.
Tests the MMS card.

GMENT: ND500 MEMORY MANAGEMENT ON TEST PROGRAM

GMENT tests the MMS with the MMS turned on.
The test program will verify the hash addressed TSB, the sequential TSB and cache clear for each channal.
Tests the MMS and Cache Control card.

PREEF: ND500 PREFETCH PROCESSOR TEST PROGRAM.

PREEF tests the prefetch processor by loading instructions into the memory, and loads and starts small micro programs. These micro programs simulate macro program execution. They read and check the prefetch status register and the P register.
The test program verify execution of instructions with no operand, with one operand. It verify execution of GO:B instuction.
It will verify execution of JMPMAP.
Tests the Prefetch card, Sequencer.

TRAPT: ND500 TRAP SYSTEM TEST PROGRAM

TRAPT tests the trap system by using the registers S1, S2 and TE.
The test program verify traps set by micro program and hardware.
Tests the Trap card and trapping logic on Cache Control, MMS, Prefetch, External Arithmetic, Slice.

EXTRA: ND500 EXTRA TEST PROGRAM

EXTRA will do some additional tests that there were no room for in the other test programs. The tests in EXTRA is mainly prefetch processor tests.
The test program verify the index counters, and conversion from byte to halfword,word and halfword to word, conditional ALU, prefetch addressing modes, descriptor addressing and macro instructions INIT, CALL, ENTS and RET.
Tests the Prefetch, Slice.

NOMAN: ND500 NO-MEMORY MANAGEMENT TEST PROGRAM

Some ND500 are not equipped with memory management. NOMAN is intended for use on these machines (Single user).
NOMAN must not be run under SINTRAN on systems where the memory is shared and the ND100 has no local memory. If this were attemted SINTRAN will be destroyed immediately.
Tests the Address Driver cards, Cache Control.

MACRO TEST PROGRAMS

ND500 EXERCISER FOR BCD ARITHMETIC

Ref: Exerciser for BCD Arithmetic attached to the PD sheet.
Discette: 10503A.

To be able to run this macro testprograms the Micro program version 1030x or 1060x must be used and BCD 500-119 on Prefetch processor must be done. If not the errormessage Protect Violation or Illigal Instruction Code will occure when trying to execute BCD instructions.

ND500 VERIFICATION TEST PROGRAM

Ref: Test Program Description ND500 Manual.

The ND500 Verification system runs under user N500-VERIFY-DOM.
This is a macro instruction test program for ND500.
It verify that the execution of all the ND500 macro instructions is correct.
The test program can be stared by the macro DESMODUR.

ND-500 MANUALS

- ND500 LOADER/MONITOR	ND-60.136
- ND500 REFERENCE MANUAL	ND-05.009
- ND500 ASSEMBLER REFERENCE MANUAL	ND-60.113
- ND500 TEST PROGRAM DESCRIPTIONS	ND-30.018
- ND500 ARRAY PROCESSING FUNCTIONS	ND-05.013
- ND500 MICRO PROGRAMMING GUIDE	ND-05.012
- ND500 TEST MICRO PROGRAM DESCRIPTION	ND-30.013
- ND500 HARDWARE DESCRIPTION	ND-05.011

Chapter 8

ND-500/2

ND-500/2

Table of contents

1 GENERAL PRODUCT INFORMATION

1.1 ND500/2 systems

1.1.1 ND530/CX:

ND530/CX Model I (ND-5331):
- One cabinet.
- MPM 5 (included in ND500/2 crate).
- No cache memory.
- Slow Extern arithmetic.
- ND500 Micro program version 1530x.

ND530/CX Model II (ND-5332):
- Two cabinets.
- MPM 5 (Two or one bank crate).
- No cache memory.
- Slow External arithmetic.
- ND500 Micro program version 1530x.

ND530/CX Model III (ND-5333):
- One cabinet.
- MPM 5 (included in ND500/2 crate).
- No Cache memory.
- Slow External arithmetic.
- ND500 Micro program version 1530x.
- Internal 140 MB disc drive and 45 MB streaming tape.

1.1.2 ND550/CX:

ND550/CX Model I (ND-5531):
- One cabinet.
- MPM 5 (included in ND500/2 crate).
- No cache memory.
- ND500 Micro program version 1520x.

ND550/CX Model II (ND-5532):
- Two cabinets.
- MPM 5 (Two or one bank crate).
- No cache memory.
- ND500 Micro program version 1520x.

ND550/CX Model III (ND-5533):
- One cabinet.
- MPM 5 (included in ND500/2 crate).
- No Cache memory.
- ND500 Micro program version 1520x.
- Internal 140 MB disc drive and 45 MB streaming tape.

1.1.3 ND560/CX:

ND560/CX Model I (ND-5631):
- One cabinet.
- MPM 5 (included in ND500/2 crate).
- No cache memory on data channel.
- ND500 Micro program version 1520x.

ND560/CX Model II (ND-5632):
- Two cabinets.
- MPM 5 (Two or one bank crate).
- No cache memory on data channel.
- ND500 Micro program version 1520x.

1.1.4 ND570/CX:

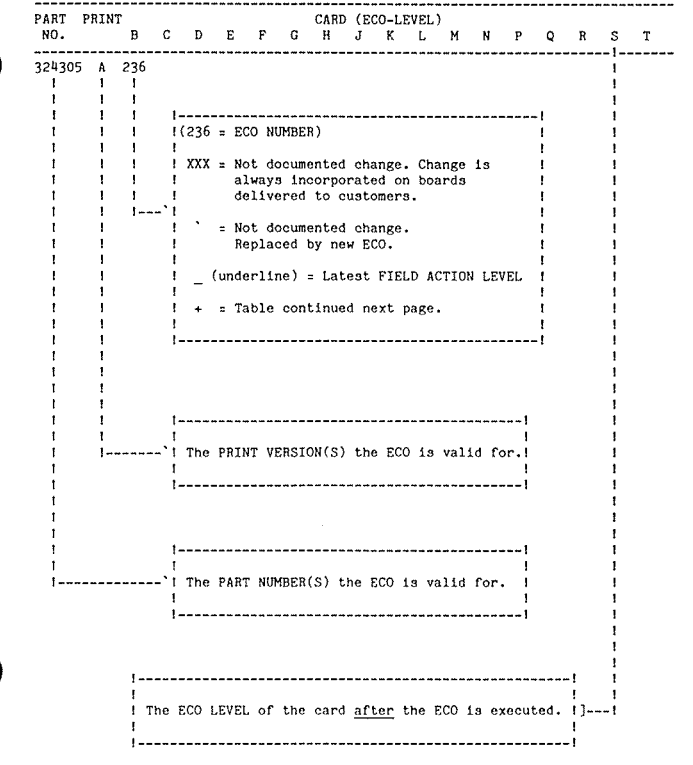
ND570/CX Model I (ND-5731):
- One cabinet.
- MPM 5 (included in ND500/2 crate).
- 32 Kbyte cache memory.
- ND500 Micro program version 1520x.

ND570/CX Model II (ND-5732):
- Two cabinets.
- MPM 5 (Two or one bank crate).
- 32 Kbyte or 64 Kbyte Cache memory.
- ND500 Micro program version 1520x.

1.2 ND500/2 MICRO PROGRAMS.

	VERS:	ND-NO:
- ND500/CXA Standard Multi CPU + RTC.....	15106	10701
- ND500/CXD Standard + dobbel array proc.	15206	10786
- ND500/CX Standard without array proc..	15306	10787

EXPLANATION



PART NO.	PRINT	CARD (ECO-LEVEL) B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
041XX	(A)																	
043XX	(A)																	
050XX	(A)																	
302XX	(A)																	
303XX	(A)																	
304XX	(A)																	
305XX	(A)																	
306XX	(A)																	
307XX	(A)																	
310XX	(A)	027																
311XX	(A)																	
312XX	(A)																	
313XX	(A)																	
314XX	(A)																	

PART NO.	PRINT	MICROPROGRAM (ECO-LEVEL) 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
15002	-	XXX	XXX	049														
15003	-	-	-	-	053													
15004	-	-	-	-	-	093												
15005	-	-	-	-	-	-												
15103	-	-	-	-	054													
15104	-	-	-	-	-	094												
15105	-	-	-	-	-	-												
15205	-	-	-	-	-	-												
15305	-	-	-	-	-	-												

AVAILABLE MICROPROGRAMS:

150XX = ND-570 CXA MICROPROGRAM (ND-10700).

151XX = ND-570 CXA MULTI CPU MICROPROGRAM (ND-10701).

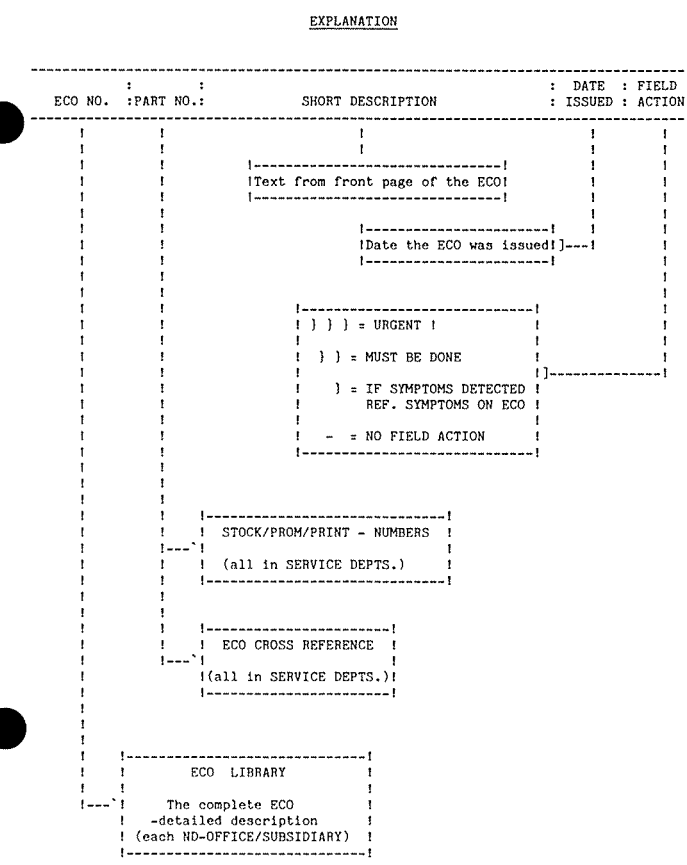
152XX = ND-500/2 CXD MICRO PROGRAM (ND-10786).

153XX = ND-500/2 CX MICRO PROGRAM (ND-10787).

PART NO.	PRINT	CARD (ECO-LEVEL)
322575	B	-
322576	B	-
322577	B	- 038
324151	C	- -
324152	E	- - - - 012 039 069
324153	F	- - - - - 013 060 077
324161	E	- - - - 078 039 069
324162	F	- - - - - > > 072
324163	B	- 044 051 059 073
324163	B	- > > > 075 095
324164	L	- - - - - - - - - - 057 063 064 071 074
324304	D	- - - 007 015 020 030 032 040 046 052 061 088 096
324305	B	- 044 051 059
324306	B	- 001 062 076 100
324306	E	- - - - 100
324307	C	- - 004 008 026 036 056 089
324308	D	- - - 006 011 016 024 025 033 047 079 080 090 092 101
324309	C	- - 005 010 017 022 031 037 055 081 091
324309	E	- - - - 018 022 031 037 055 081 091
324310	C	- - 002 014 021 023 034 042 045 048 057 058 064 070 074 087
324310	E	- - - - 021 023 034 043 045 048 057 058 064 070 074 087
324310	L	- - - - - - - - - - 057 063 064 071 074 087
324311	B	- 019 035 082
324312	C	- - 003 009 028 029 041 050 086 097 099
324318	A	
324415	B	- 068 083
324416	B	-
324417	B	-
324418	B	- 067
324420	A	

PART NO.	PRINT	CARD (ECO-LEVEL) B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
324424	A	084																
324425	A	084																
324426	A	084																
324427	A	065																
324428	A																	
324429	A																	
324430	A																	
324435	A	085																
324438	A																	
324445	B																	
324446	B																	
324447	A	066																
324448	A	084																

EXPLANATION



ECO NO.	PART NO.	Volume-1 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500/2-001	324306	Pref-test failing, trace system not operating properly.	830630	
500/2-002	324310	Error in "wait for Memory Management", cache inhibit and critical timing.	831101	} }
500/2-003 B	324312	a)Cache write inhibit when trap from M.M. New clear signal at cycle start. b)Print error.	840614	} }
500/2-004	324307	Real time clock does not count.	831101	} }
500/2-005	324309	Collection of miscellaneous ECO<s causing different errors.	831101	} }
500/2-006 C	324308	Modifications necessary due to noise problems.	831101	} }
500/2-007	324304	Design error.	831101	} }
500/2-008	324307	Print error.	831118	
500/2-009 B	324312	Marginal pulse to address counter (SWORD). False address OK (ATOK).(New revision B of ECO:500/2-003).	840614	
500/2-010	324309	Accumulated floating overflow and floating underflow are inverted.	831118	
500/2-011	324308	Improvement of noise margins on AFUNC bits.	831121	
500/2-012 C	324152	Improvement of selecting operand after comperation in floating operation. (Ref. ECO:500/2-013).	840830	
500/2-013 C	324153	Improve cyclespeed. Insert active indicator. (ECO:500/2-012 has to be completed first).	840830	
500/2-014	324310	Wrong data suplied from cache.	831212	
500/2-015 C	324304	a)Handshake on IDRQ and IDRY-0. b)Too short addresscycle. c)Noise.	841205	} }
500/2-016	324308	Noise detected on PACLK and MACLK.	831229	}
500/2-017 B	324309	Marginal PICLK on constants, Arangement-error.	840307	
500/2-018 B	324309	Possible hangup of CPU.	840307	
500/2-019 B	324311	Marginal XDSLIC.	840307	
500/2-020	324304	a)Wrong waiting state in addressprocessor when to reg. in same cycle. b)Noise on BMCL and PCL-0.	840119	
500/2-021 B	324310	Marginal timing on clock to BLOCK signal.	840227	
599/2-022	324309	Skipping of instructions may occur when getting DFAIL and Single instr. trapp simultaneously.(Error is detected when using the Debugger).	840223	
500/2-023	324310	Too short address strobe in some sequenses:	840314	}
500/2-024	324308	The testprograms "STRINGS-1" and "STRINGS-6" are failing due to incorrect loading of the R-register.	840201	
500/2-025	324308	Curing different noise problems.	840201	
500/2-026	324307	Change due to improper operation of the timer clock. Resistors and capacitors added to improve noise margins.	840201	
500/2-027	310XX	MMW missing in Move-instruction. Protect violation in Fortran compiler. ECO:500/2-028 must be done together with this ECO.	840307	}
500/2-028	324312	Wait for Memory Management should not give write protect violation or write permit trap.	840220	}

ECO NO.	PART NO.	Volume-1 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500/2-029	324312	Disable "fast option" Memory Management.	840314	
500/2-030	324304	1)Bad handshake in call inst. when Prefetch and CPU want to use the add. aritch. at the same time. 2)Two gates are driving AASEL at the same time. Symptoms are Prot. viol. or Traphandler missing with bad program address.	840307	)
500/2-031	324309	Constants may fail with high marginal voltage.	840328	)
500/2-032	324304	Address latch to slice and cache must be separated due to reflections in backwiring:	840328	)
500/2-033	324308	Noise on internal data bus. Symptom is calculation error.	840314	)
500/2-034 B	324310	Wrong polarity on decupling capacitor.	840711	
500/2-035	324311	Wrong polarity on decupling capacitor.	840328	
500/2-036	324307	Problems with 74F240 driving address- arithmetic control bus. Symptoms are calculation error.	840307	)
500/2-037	324309	Marginal clocking of data to CPU from instruction channel when running "full cache".	840328	
500/2-038	322577	Fatal error.	840322	
500/2-039 B	324152/: 324161	Too weak GND on IC 14E. Error symtom: Floating overflow.	840830	)
500/2-040 B	324304	Noise on VLBO-1. Symptom is illegal opperand specifier.	840606	)
500/2-041 B	324312	This ECO requires ECO:500/2-042 alt. 043 on CACHE CONTROL. Critical timing on address latch Memory Management. (New revision B of ECO:500/2-009).	840606	)
500/2-042	324310	This ECO requires ECO:500/2-041 on MEMORY MANAGEMENT. Critical timing on address latch Memory Management.	840411	)
500/2-043	324310	This ECO requires ECO:500/2-041 on MEMORY MANAGEMENT. Critical timing on address latch Memory Management.	840411	)
500/2-044 B	324305/: 324163	This ECO must be done on double cache (2 data + 2 instruction) configurations.	840830	)
500/2-045 B	324310	This modification must be done on CPU<s with double cache (2 + 2 modules). (Rev. Ref. B`058)	840912	)
500/2-046	324304	Noise on AD1-0.	840528	)
500/2-047	324308	Too slow RAM packages mounted on some slice modules. Symptom: Contents in Trace module are wrong.	840528	)
500/2-048 B	324310	Several testprograms give "Hardware Fault": Critical timing in detection of cache parity error. (Ref. ECO:500/2-070).	841003	)
500/2-049	150XX	Error correction for histogram instructions Wn PWCONV, all loop instructions of data type double. Unexpected Disable Process Switch Error trap corrected. New discette.	840503	)

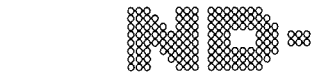
ECO NO.	PART NO.	Volume-2 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500/2-050	324312	Error message: "Prefetch processor not finished".	840528	}
500/2-051 B	324305/: 324163	Marginal timing on data strobe to memroy write buffer. Different testprograms failing. Error detected on "double cache" systems.	840830	}
500/2-052 D	324304	Data from ICACHE too slow when double cache.	840712	}
500/2-053	150XX	Error correction for tn RDUS]source/r/t`.: Error correction for call instructions in case of description prefix of parameters. Temporary failing corrected for loop instructions of data type double floating point. IMGBLD routine in AX library corrected. New discette.	840612	}
500/2-054	151XX	Error correction for tn RDUS]source/r/t`.: Error correction for call instructions in case of description prefix of parameters. Temporary failing corrected for loop instructions of data type double floating point. IMGBLD routine in AX library corrected. New discette.	840612	}
500/2-055	324309	Improve trace on illegal Instruction Code.: Correct detection of addr. traps together with DFAIL.	840628	}
500/2-056	324307	Descriptor adressed parameters in CALL- instruction does not work.	840628	}
500/2-057 B	324310/: 324164	Data Cache parity error.	840830	}
500/2-058 B	324310	1)Cache disable. 2)False cache hit, data error. 3)Error in TESET instruction. 4)Address error in double cycle, Address outside segment bounds. (New revision B of ECO:500/2-045).	840926	}
500/2-059 D	324305	Request enabling.	841004	
500/2-060 C	324153	Design modification of the timing.	840927	
500/2-061	324304	Symptom: Illegal instruction code, protect: violation in description addressing. Marginal latch of the PDP bus in IDRY.	840628	}
500/2-062 B	324306	1.Some sequencer boards has too slow RAM packages. 2.Improve trace on illegal instruction code. 3.Some more info to the micro trace memory. Symptom: 4.Time-out N500 status=0 uP=266.	840830	}
500/2-063 B	324310/: 324164	1)Cache disable. 2)False cache hit, data error. 3)Error in TESET instruction. 4)Address error in double cycle, Address outside segment bounds.	840927	}
500/2-064	324310/: 324164	1)"Data Memory Parity" in SPEC-INS. 2)SSMOVE, error in "supermove".	840911	}
500/2-065	324427	Connection for trace on Illegal Instruction. ECO:500/2-055 and 500/2-062 must be done.	840905	

ECO NO.	PART NO.	Volume-2 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500/2-066	324447	Connection for trace on Illegal Instruction. ECO:500/2-055 and 500/2-062 must be done.	840905	
500/2-067	324418	Connection for trace on Illegal Instruction. ECO:500/2-055 and 500/2-062 must be done.	840905	
500/2-068	324415	Improve trace module. Selection of NPC or LAD to be stored in trace memory can be controlled by the trace module. Valid for next print version of Slice module.	841108	
500/2-069	324161/ 324152	Failing in BCD testprogram and sometimes in ARITH test 20. Noise on signal ADDEN-1.	840919	)
500/2-070	324310	Marginal setting of "BLOCK" (CLE) at cache parity error. Control that Rev.B of ECO:500/2-048 is done.	840919	)
500/2-071	324164/ 324310	Marginal setting of "BLOCK" (CLE) at cache parity error.	840919	)
500/2-072	324162	Marginal timing. (F ` J Ref. ECO:500/2-013,060,077)	841022	
500/2-073	324163	ECO:500/2-044 and ECO:500/2-059 only valid on 324305.(New revision C of ECO:500/2-044 and revision D of ECO:500/2-059).	841009	)
500/2-074 B	324310/ 324164	Memory request not reset. Memory Timeout in different test-programs.	841010	)
500/2-075	324163	Replacement for ECO:500/2-044,051,059,073. a)Must be done on double cache(2 data + 2 instruction)configurations.b)Marginal timing on data strobe to memory write buffer. Different testprograms failing. Error detected on "double cache" system.	841009	)
500/2-076	324306	Control instruction for revision B of ECO:500/2-062. Dummy upgrading of version if revision B or later revisions of ECO-500/2-062 are used.	841011	)
500/2-077	324153	Control instruction for revision C of ECO:500/2-060. Dummy upgrading of version if revision C or later revisions of ECO:500/2-060 are used.	841022	
500/2-078	324161	Dummy upgrading of version. (Ref.ECO:500/2-012 Revison C)	841024	
500/2-079	324308	"Super" calculations failing due to noise on data bus on Slice when writing double-precision operands.	841030	)
500/2-080 B	324308	Illegal instruction code or similar messages may appear, because of wrong updating of PC or NP caused by backwiring noise. (Dependent on ECO:500/2-081 and ECO:500/2-083 or 084 or 085)	841030	)
500/2-081	324309	a)Illegal instruction code or illegal operand specifier due to noise on NPC and /or PCCLK.(Ref ECO:500/2-080,083,084,085) b)Error in calculations of"Super"program.	841030	)
500/2-082	324311	Error message is Control Store parity error. Malfunction cased by noise from instruction data bus.	841030	)

ECO NO.	PART NO.	Volume-2 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500/2-083	324415	Illegal instruction code or similar messages may appear, because of wrong updating of PC or NP caused by backwiring noise. (Ref. ECO:500/2-080 and 081)	841030	}
500/2-084	324448/: 324424/: 324425/: 324426	Illegal instruction code or similar messages may appear, because of wrong updating of PC or NP caused by backwiring noise. (Ref. ECO:500/2-080 and 081)	841030	}
500/2-085	324435	Illegal instruction code or similar messages may appear, because of wrong updating of PC or NP caused by backwiring noise. (Ref. ECO:500/2-080 and 081)	841030	}
500/2-086 B	324312	N500 hang-up in high voltage test (5,25V). Nord 500 Timeout. (Rev. Ref. B ` 097)	841214	}
500/2-087 B	324310	a)Possible hang-up in "Cach Clear" after power up. b)Statusbits to indicate CPU-version.	841203	}
500/2-088 B	324304	PSTOP-1 turnd off too early because of too fast updating of VLB. Symptom: Timeout Prefetchprocessor not finished.	841128	}
500/2-089	324307	Noise on AASELA 0-2. Symptom: Floating overflow or Protect Violation due to wrong B register.	841120	}
500/2-090	324308	Marginal clock of DP 1 register when using MV,DTOP. Symptom: Protect Violation in BCD-EXERCISER.	841120	}
500/2-091	324309	Noise on MPC-0. Wrong contains of P register after restart from trap. Symptom: ILLI or Protect Violation.	841120	}
500/2-092	324308	Libtest failing in TAN & ATAN due to noise generated from the short rise time of F-logic.	841126	}
500/2-093	150XX	New discette: Error correction for BY SSMOPV for machines with 64 Kbyte cache size. New instruction implemented for handling the hardware trace module. Improve response to terminate from ND100. Corrected use of TSB on instuction channel. Corrected info on Hardware fault. Clear TSB only when leaving SWAPPER process.	841126	}
500/2-094	151XX	New discette: Error correction for BY SSMOPV for machines with 64 Kbyte cache size. New instruction implemented for handling the hardware trace module. Improve response to terminate from ND100. Corrected use of TSB on instuction channel. Corrected info on Hardware fault. LOCK used in connection with update of PGU and WIP table.	841126	}
500/2-095	324163	Arrangement error.	841205	
500/2-096	324304	a) Noise on IDB-bus to prefetch. Sidry Latch changed. Symptom: Illigal instruction or illigal operand specifier. (New rev. C of ECO:500/2-015) b) AAFUNC turned off too early compared to ADL.	841205	}

ECO NO.	PART NO.	Volume-2 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500/2-097	324312	Data Memory reference not finished.	841228	}
		(New revision B of ECO:500/2-086)		
500/2-099	324312	To early TSBFS-0 when double cycle(SWORD).	850117	}
		Symptom: Trap handler missing.		

ECO NO.	PART NO.	Volume-3 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
500/2-100	324306	Noise on XD bus when reading argument. Must be done when installing new microprogram version 15X06.	850128	}
500/2-101	325308	Test 3 in Memic is failing 1/8 IX. BCD exerciser may fail with data error.	850128	}



PART/PROM/PRINT - NUMBERS CROSS REFERENCE

LIST 1. PART NUMBERS RELATED

LIST 2. PROM NUMBERS RELATED

LIST 3. PRINT NUMBERS RELATED

ISSUED BY: TECHNICAL INFORMATION GROUP

LIST 1. PART NUMBERS RELATED

PART No.	NAME	PRINT	PROM
322509	ARITHMETIC 2	5009	033XX 034XX 035XX 038XX
322575	CACHE ADAPTER	5221	-
322576	CACHE CONTROL ADAPTER	5222	-
322577	MEMORY MANAGEMENT ADAPTER	5223	-
324151	8K CS RAM a la "GEPETTO"	5401	059XX
324152	ARITHMETIC 1	5008	036XX 037XX
324153	ARITHMETIC 2	5009	034XX 038XX 098XX 099XX
324154	ARITHMETIC 3	5011	098XX
324155	ARITHMETIC 4	5014	-
324160	ND-500/2 & MPM5 EXTENSION CARD	5212	-
324161	ARITHMETIC 1	5008	036XX 037XX
324162	ARITHMETIC 2	5009	033XX 034XX 035XX 038XX
324163	MEMORY CHANNEL DRIVER	5105	307XX
324164	MEMORY CHANNEL CONTROL	5110	306XX
324304	PREFETCH	5104	310XX 311XX 312XX 313XX 314XX
324305	CACHE MODULE	5105	306XX
324306	SEQUENCER	5106	302XX 303XX
324307	CONTROL II	5107	043XX
324308	SLICE	5108	-
324309	TRAP	5109	351XX
324310	CACHE CONTROL	5110	307XX
324311	CONTROL I	5111	041XX 304XX 305XX
324312	MEMORY MANAGEMENT	5112	-
324415	GEPETTO-BW-A	5351	-
324416	GEPETTO-BW-B	5352	-
324417	GEPETTO-BW-C	5353	-
324418	GEPETTO-BW-D	5354	-
324424	ND-500/2-M-BW-AD	5391	-
324425	ND-500/2-M-BW-AE	5392	-
324426	ND-500/2-M-BW-AF	5393	-
324427	ND-500/2-M-BW-DF	5394	-
324428	ND-500/2-BW-AD	5395	-
324429	ND-500/2-BW-AE	5396	-
324430	ND-500/2-BW-AF	5397	-
324420	ND-500/2-BW-DF	5394	-
324435	GEPETTO-BW-A	5355	-
324438	GEPETTO-BW-D	5358	-
324445	ND-500/2-M-BW-B	5362	-

LIST 1. PART NUMBERS RELATED

PART No.	NAME	PRINT	PROM
324446	ND-500/2-M-BW-C	5363	-
324447	ND-500/2-M-BW-D	5364	-
324448	ND-500/2-M-BW-A	5371	-

LIST 2. PROM NUMBERS RELATED

PROM	NAME	PRINT	PART
033XX	M-ADDER	5009	322509
			324162
034XX	FLOATING CONTROL	5009	322509
			324153
			324162
035XX	STATUS & ARITHMETIC	5009	322509
			324162
036XX	DATA DISABLE	5008	324152
			324161
037XX	DIVIDE TABLE	5008	324152
			324161
038XX	DIVIDE CORRECTION	5009	322509
			324162
041XX	OR-LOGIC-PROMS	5111	324311
043XX	DESCRIPTOR-SCALING	5107	324307
059XX	CSA-DECODE-8K	5401	324151
098XX	M-ADDER	5009	324153
			324154
099XX	STATUS & ARITHMETIC	5009	324153
302XX	SPEC. ENTRY POINT	5106	324306
303XX	ENTRY POINT MAP	5106	324306
304XX	CONSTANT DECODE	5111	324311
305XX	OR LOGIC B-OPERAND	5111	324311
306XX	CONTROL LOGIC	5105	324305
		5110	324164
307XX	CONTROL LOGIC	5105	324163
		5110	324310
310XX	PREFETCH MICROCODE	5104	324304
311XX	OPCODE MAPPING	5104	324304
312XX	ADDRESS PROCESSOR MICROCODE	5104	324304
313XX	INSTRUCTION DECODER	5104	324304
314XX	DATA LENGTH	5104	324304
351XX	SCALE-ERROR	5109	324309

LIST 3. PRINT NUMBERS RELATED

PRINT	NAME	PART No.	PROM
5008	ARITHMETIC 1	324152	036XX
			037XX
5008	ARITHMETIC 1	324161	036XX
			037XX
5009	ARITHMETIC 2	322509	033XX
			034XX
			035XX
			038XX
5009	ARITHMETIC 2	324153	034XX
			038XX
			098XX
			099XX
5009	ARITHMETIC 2	324162	033XX
			034XX
			035XX
			038XX
5011	ARITHMETIC 3	324154	098XX
5014	ARITHMETIC 4	324155	-
5104	PREFETCH	324304	310XX
			311XX
			312XX
			313XX
			314XX
5105	CACHE MODULE	324163	307XX
		324305	306XX
5106	SEQUENCER	324306	302XX
			303XX
5107	CONTROL II	324307	043XX
5108	SLICE	324308	-
5109	TRAP	324309	351XX
5110	CACHE CONTROL	324164	306XX
		324310	307XX
5111	CONTROL I	324311	041XX
			304XX
			305XX
5112	MEMORY MANAGEMENT	324312	-
5212	ND-500/2 & MPM5 EXTENSION CARD	324160	-
5221	CACHE ADAPTER	322575	-
5222	CACHE CONTROL ADAPTER	322576	-
5223	MEMORY MANAGEMENT ADAPTER	322577	-
5351	GEPETTO-BW-A	324415	-
5352	GEPETTO-BW-B	324416	-
5353	GEPETTO-BW-C	324417	-
5354	GEPETTO-BW-D	324418	-
5355	GEPETTO-BW-A	324435	-
5358	GEPETTO-BW-D	324438	-
5362	ND-500/2-M-BW-B	324445	-
5363	ND-500/2-M-BW-C	324446	-
5364	ND-500/2-M-BW-D	324447	-
5371	ND-500/2-M-BW-A	324448	-
5391	ND-500/2-M-BW-AD	324424	-
5392	ND-500/2-M-BW-AE	324425	-
5393	ND-500/2-M-BW-AF	324426	-
5394	ND-500/2-M-BW-DF	324427	-
5394	ND-500/2-BW-DF	324438	-
5395	ND-500/2-BW-AD	324435	-

LIST 3. PRINT NUMBERS RELATED

PRINT	NAME	PART No.	PROM
5396	ND-500/2-BW-AE	324435	-
5397	ND-500/2-BW-AF	324435	-
5401	8K CS RAM a la "GEPETTO"	324151	059XX

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CONTROL LOGIC 32x8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
30600	6D																							
30601	7D																							
30602	9D																							
ECO 500/2																								

III-8-69-7

ID NO
324163
324305

Corrected | Date | Sign

ND500/2
MICROPROGRAM REGISTRATION
SHEET
STANDARD A

Print no / Scale
5105

Drawn TRO 10 07 84
Contr JH
Page of

Replacement for

NORSK DATA A.S
Oslo, Norway

Replaced by

CONTROL LOGIC 32×8

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
30700	4C																							
30701	19D																							
ECO 500/2-																								

ID NO 324164
324310

Corrections ENG. SPEC. 84-023. | Date 09.02.84 | Sign

ND-500/2
MICROPROGRAM REGISTRATION
SHEET
STANDARD A

Print no / Scale 5110 | Drawn OF 10.07.84 | Contr JH | Page of

Replacement for

NORSK [illegible] A.S
Oslo

Replaced by

CONTROL LOGIC 32x8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
30600	60																							
30601	70																							
30602	90																							
ECO 500/2																								

III-8-6-9

ID NO
324165
324316

Corrected	Date	Sign

NO500/2 MICROPROGRAM REGISTRATION	Print no / Scale 5116	Drawn TRO 17.10.84 Contr JH Page 1 of 1
SHEET STANDARD A	Replacement for	
NORSK DATA A.S Oslo, Norway	Replaced by	

CSA - DECODE - 16 K (32× 8 PROM)

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
36400	1A																							
ECO 5001?-																								

01 - 9 - 8 - III

ID NO
324202

Corrected	Date	Sign

NO-5001?
MICROPROGRAM REGISTRATION
SHEET
STANDARD A

Print no / Scale
Drawn OHC 19.07.84
Contr
5402
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Replacement for

NORSK DATA A.S
C[illegible]ay

Replaced by

PREFETCH ... CODE 512×4

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
310 0 0	2G	A																						
310 0 1	3G	A																						
310 0 2	4G	A																						
310 0 3	5G	A																						
310 0 4	1G	A																						
310 0 5	6G	B																						
310 0 6	7G	A																						
310 0 7	8G	A																						
ECO 500/2		027																						

OPCODE MAPPING 1024×8

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
311 0 0	22B																							
311 0 1	24B																							
311 0 2	21B																							
311 0 3	23B																							
ECO 500/2																								

ADDR PROCESSOR MICROCODE 512×4

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
312 0 0	26H																							
312 0 1	25H																							
312 0 2	27H																							
312 0 3	27G																							
312 0 4	26G																							
ECO 500/2																								

III - 8 - 6 - 11

ID NO 324304

ECO 500/2-200

Corrected | Date | Sign

ND-500/2
MICROPROGRAM REGISTRATION
SHEET
STANDARD A

Print no / Scale: 5104

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Contr IR
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Replacement for

NORSK DATA A.S
Oslo, Norway

Replaced by

INSTRUCTION DECODER

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3.1300	15C																							
ECO 500/2																								

DATA LENGTH

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3.1400	30F																							
ECO 500/2																								

TONO
324.304

Corrected | Date | Sign

MO-500/2
MICROPROGRAM REGISTRATION
SHEET
ST[illegible]D A

Drawing no / Scale
5104

Drawn OF 15.06.83
Contr. IH
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Replacement for

NOR[illegible]TA A.S
Oslo, Norway

Replacement by

CONTROL LOGIC 32×8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
306 00	6D																							
306 01	7D																							
306 02	9D																							
ECO 500/2																								

III - 8 - 6 - 13

TD NO
324305

Corrected	Date	Sign
ND500/2 MICROPROGRAM REGISTRATION SHEET STANDARD A	Print no / Scale 5105	Drawn TPO 05.05.83 Contr JH Page of Replacement for
NORSK DATA A.S Oslo, Norway		Replaced by

SPEC ENTRY POINTS 512×8

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
30200	19D																							
30201	19E																							
ECO 500/2																								

ENTRY POINT MAP 2048×4

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
30300	19G																							
30301	20G																							
30302	21G																							
30303	22G																							
30304	19H																							
30305	20H																							
30306	21H																							
30307	22H																							
ECO 500/2																								

A1-9-8-III

ID NO 324306

Corrected	Date	Sign

ND-500/2
MICROPROGRAM REGISTRATION
SHEET
STANDARD A

Print no/ Scale: 5106

Drawn DF 05.05.83
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Page of

Replacement for

NOR[illegible]A A.S
O[illegible]ay

Replaced by

DESCRIPTOR · SCALING 32 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 4 3 0 0	26B																							
ECO 50012																								

51 - 9 - 8 - III

		TD NO 324307
Corrected	Date	Sign
ND-50012 MICROPROGRAM REGISTRATION SHEET STANDARD A	Print no / Scale	Drawn BW 30 06 8
		Contr
	5107	Page of
	Replacement for	
NORSK DATA A.S Oslo, Norway		
	Replaced by	

SCALE · ERROR 512 x 4 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 5 0 0 0	19B																							
ECO 500/2-																								

Corrected	Date	Sign
ND · 500/2 MICROPROGRAM REGISTRATION SHEET STANDARD A	Print no / Scale 5109	Drawn BW 10.08.83 Contr Page of
NOR TA A.S (WAY	Replacement for Replaced by	

TO NO 324309

CONTROL LOGIC 32×8

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
207000	4C	B																						
207001	19D	B																						
ECO 500/2-																								

III - 8 - 6 - 14

ID NO
324310

Corrected	Date	Sign

ND:500/2
MICROPROGRAM REGISTRATION
SHEET
STANDARD A

Print no / Scale
5110

Drawn DF 05.05.83
Contr. JH
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Replacement for

NORSK DATA A.S
Oslo, Norway

Replaced by

OR-LOGIC-PROMS 512 x 4 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
0 4 1 0 3	3G																							
0 4 1 0 4	5G																							
0 4 1 0 5	7G																							
0 4 1 0 6	4H																							
0 4 1 0 7	6H																							
0 4 1 0 8	8H																							
ECO 500/2-																								

CONSTANT DECODE 32 x 8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 0 4 0 0	23C																							
3 0 4 0 1	24C																							
ECO 500/2-																								

OR LOGIC B-OPERAND 512 x 4 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 0 5 0 0	2F																							
3 0 5 0 1	4F																							
3 0 5 0 2	6F																							
ECO 500/2-																								

III - 8 - 6 - 18

TD NO
324.311

Corrected | Date | Sign

ND500/2
MICROPROGRAM REGISTRATION
SHEET
STANDARD A

Print no / Scale 5111
Drawn TRO 10.05.83
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Replacement for

NORSK DATA A.S
Oslo, Norway

Replaced by

ND500/2 MANUALS.;

- ND500 LOADER/MONITOR..... ND-60.136
- ND500 REFERENCE MANUAL..... ND-05.009
- ND500 ASSEMBLER REFERENCE MANUAL..... ND-60.113
- ND500 TEST PROGRAM DESCRIPTIONS..... ND-30.018
- ND500 ARRAY PROCESSING FUNCTIONS..... ND-05.013
- ND500 MAINTENANCE MANUAL..... ND-30.014
- ND500/2 MICRO PROGRAMMING GUIDE..... ND-05.014
- ND500/2 TEST MICRO PROGRAM DESCRIPTION. ND-30.029
- ND500/2 HARDWARE DESCRIPTION..... ND-05.015

Chapter 9

ND-380 series

ND-380 series

Table of contents

1 TEST PROGRAMS:

1.1 ND500/2 TEST PROGRAMS.

1.1.1 MICRO TEST PROGRAMS.

Ref: ND500/2 Test Micro Program Description Manual ND-30.029.
Discette: ND-10521A.

The micro test programs may be run in three different ways:

- Stand alone.
- One by one with SINTRAN
  The Micro Testprograms are loaded as RT programs from user N500-MICRO-TEST. The Micro testprograms can be started from any terminal by using the program STMIC from user RT. Remember to load the Control Store after initial load of the system before running any micro testprograms as RT programs. Else the reserving of any memory will fail in the initializing of the testprogram.
- All programs in sequence with SINTRAN.
  This can be done with another RT program called HAREM.

In every Micro testprogram there is a user micro program. It makes it possible for the user to create, modify and start his own micro program.

1.1.2 COMTE: ND100/ND500 Communication test program.

COMTE tests the communication between ND100 and ND500/2. The first 39 routines are not micro programmed. They just use IOX instructions from the ND100, the ND500/2 is passive. From test 40 the communication is testet from ND500/2. If the program runs under SINTRAN, it will reserve the ND500/2 and possibly some memory (COMTE needs no ND500/2 memory). The program ask for maximum control store address. If the answer is 0 the micro program loops will not be used. Maximum control store address is 20000. Minimum control store address is 0. In the program there are some test routines and verification routines.

The verification routines test the following:

- Test 23 - 29 verify the ND500 Interface board.
- Test 30 - 36 verify the ND500 Interf, different registers on Control 2 board.
- Test 37 - 39 verify the ND500 Interf, registers on Control 2, Control Store board.
- Test 40 - 49 verify the ND500 Interf, Control 2, Control store board, sequensing logic on Sequencer.

1.1.3 SLICE: ND500 Slice test program.

SLICE tests the ND500/2 slice and sequencing. Tests the single step, sequencing trough single stepping, bit mask, ALU functions, registers on SLICE boards, loop counter on Control 1 board.

1.1.4 ARITH: ND500/2 External Arithmetic test program.

ARITH tests the external arithmetic. It does this by loading small micro programs that shift logical, arithmetical and rotational. They also do floating add, subtract, multiply and divide. ARITH tests the Arith 1, Arith 2, Arith 3 and Arith 4. Some functions on the Slice, Control 2, Sequencer.

1.1.5 MEMIC: ND500/2 Cache and Memory test program.

MEMIC tests the ND500/2 memory and cache. There are two channals, one for data and one for instructions. MEMIC can verify both cache and memory, only cache or only memory. It may run with memory management (paging) on, or off. The memory configuration of a system may be checked by the stand alone testprogram MPEST. MEMIC asks for the last and the first memory address. Memory addresses occupy 30 bits. Memic will set the two last bits in the address to zero, to get addresses in word boundary. If the last address are given as 0, the memory for this channel will not be tested. MEMIC asks for the number of cache modules for the channal. If the answer is 1 or 2, Memic will print the corresponding last cache address. If the answer is 0 the cache memory for this channal will not be tested. The program will set the don't-use-cache bit in the memory modus register. MEMIC asks if the MMS is to be on or off. After this question an initiation micro program is run. It will clear the cache, set up some registers, and if the MMS is on, fill the TSB. If the memory specified is bigger than the TSB the program will change the last memory address for the channal. The TSB can contain 4377 pages (oct), that means MEMIC can not test more memory than 4377 pages = 4 1/2 Mbyte with MMS on. MEMIC asks whether the tests 4 to 7 should check memory and cache parity or not. If the answer is Y, the memory status registers will be read and checked for every memory read. The IR register will only be used when no cache.

Test 3 verify address arithmetic on the Slice module.

MEMIC verify the MMS card, Cache module, Cache Control, MPM ports for ND500/2 and Memory system, memory control logic on Trap card.

1.1.6 GMOFF: ND500/2 Memory Management Off test program.

GMOFF tests the MMS with the MMS turned off. GMOFF ask for the same parameters as for MEMIC. GMOFF verify the Scratch file, DLADDR/ILADDR (Logical addr.reg) and DRADDR/IRADDR (Real addr.reg) for data and instruction channal.

1.1.7 GMENT: ND500/2 Memory Management On test program.

GMENT tests the MMS with the MMS turned on. The test program will verify the hash addressed TSB, the sequential TSB and cache clear for each channel. Tests the MMS and Cache Control card.

1.1.8 PREEF: ND500/2 Prefetch Processor test program.

PREEF tests the prefetch processor (5104) by loading instructions into the memory, and loads and starts small micro programs. These micro programs simulate macro program execution. They read and check the

prefetch status register on Sequencer (5106) and the P register on the Slice (5108). The test program verify execution of instructions with no operand, with one operand. It verify execution of GO:B instuction. It will verify execution of JMPMAP and INIT, CALL, ENTM and RET. Tests the Prefetch card, Sequencer.

1.1.9 TRAPT: ND500/2 Trap System test program.

TRAPT tests the trap system by using the registers S1, S2 and TE. The test program verify traps set by micro program and hardwace. Tests the Trap card and trapping logic on Cache Control, MMS, Prefetch, External Arithmetic, Slice.

1.1.10 EXTRA: ND500/2 Extra test program.

EXTRA will do some additional tests that there were no room for in the other test programs. The tests in EXTRA is mainly prefetch processor tests. The test program verify the index counters, and conversion from byte to halfword,word and halfword to word, conditional ALU, prefetch addressing modes and descriptor addressing. Tests the Prefetch, Slice.

1.1.11 ADDIT: An additional ND-500/2 test program.

The tests in ADDIT is memory and cache tests. It verifys the Data cache and memory with lot of s-word and read-before-write cycles. Write address in address in the data memory and read back from the instruction channel and the other way.

1.2 MACRO TEST PROGRAMS.

1.2.1 ND500 EXERCISER FOR BCD ARITHMETIC.

Ref: Exerciser for BCD Arithmetic attached to the PD sheet.
Discette: 10503A.

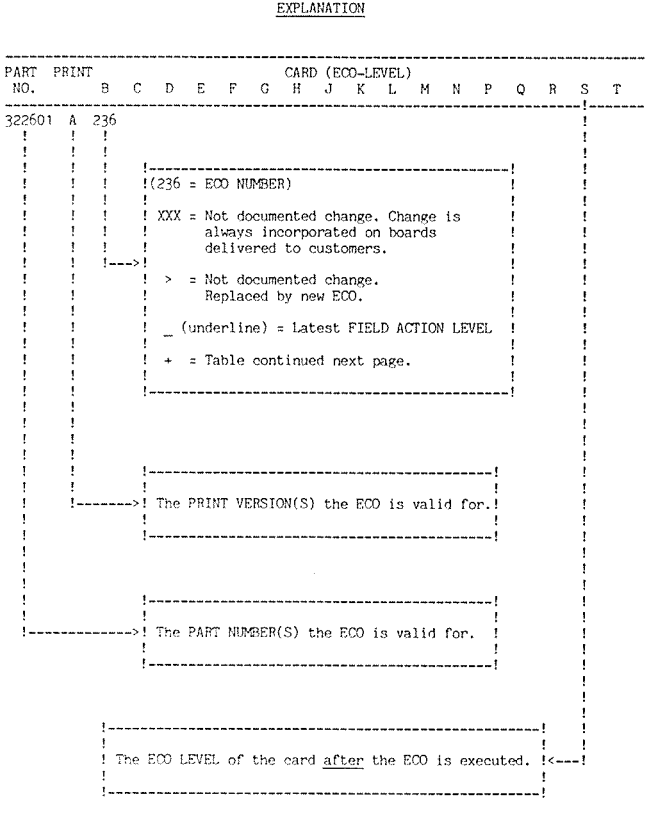
Verifies the BCD Arithmetic board (5103).

1.2.2 ND500 VERIFICATION TEST PROGRAM.

Ref: Test Program Description ND500 Manual.

The ND500 Verification system runs under user N500-VERIFY-DOM. This is a macro instruction test program for ND500. It verify that the execution of all the ND500 macro instructions is correct. The test program can be stared by the macro DESMDDUR.

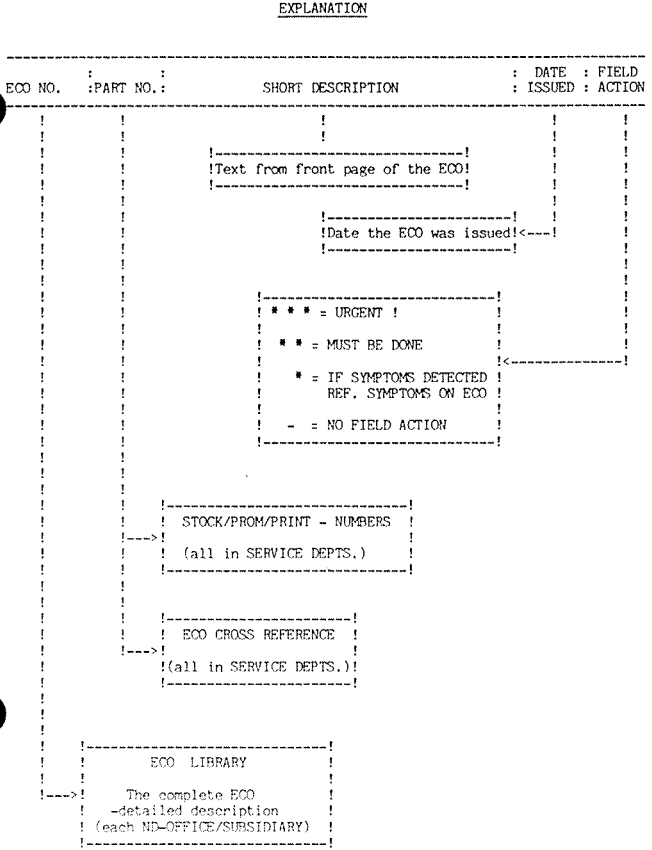
EXPLANATION



PART NO.	PRINT	CARD (ECO-LEVEL) B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
322XX	(A)																	
323XX	(A)																	
324XX	(A)																	
325XX	(A)																	
326XX	(A)																	
327XX	(A)																	
328XX	(A)																	
329XX	(A)	017	024	037														
330XX	(A)	017	024	037														
331XX	(A)	017	024	037														
332XX	(A)	017	024	037														
333XX	(A)	017	024	037														
334XX	(A)	017	024	037														
335XX	(A)																	
336XX	(A)																	
337XX	(A)																	
338XX	(A)																	
339XX	(A)																	
340XX	(A)																	
341XX	(A)																	
342XX	(A)																	

PART NO.	PRINT	CARD (ECO-LEVEL) B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
324158	C	-	-	005	007	011												
324158	C	-	-	005	>	012	019	021	027	033	036	038	040	042				
324158	F	-	-	-	-	-	019	021	028	033	036	038	039	042				
324168	F	-	-	-	-	-	019	021	028	033	036	038	039	042				
324211	C	-	-	004	007	011												
324211	C	-	-	004	>	012	019	021	027	033	036	038	040	042				
324211	F	-	-	-	-	-	019	021	028	033	036	038	039	042				
324251	B	-																
324252	B	-																
324351	D	-	-	-	001	008	010	013	018	020	022	026	031	034				
324352	C	-	-	002	003	006	009	014	025	030								
324354	B	-	023	029	032	035												
324355	A	041	043															
324421	B	-	015															
324422	B	-	016															
324431	B	-																
324432	B	-																
324433	B	-																
324434	B	-																

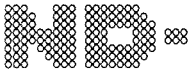
EXPLANATION



ECO NO.	PART NO.	Volume-1 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
380-001 B	324351	Timeout for TEST AND SET in MPM5. (Loss of meaning caused by ECO:380-018).	840105	
380-002 C	324352	Machine may stop if drivers are removed.	840104	
380-003	324352	a)Memory out of range when using 2 or 4 ports in interleave. b)Noise on ARY-1. c)Print error.	830916	
380-004	324211	Miscellaneous design improvements.	831003	
380-005	324158	Miscellaneous design improvements. Timing correction for 150nS packages.	830930	
380-006 B	324352	Dummy upgrading of version. (Ref. ECO:380-014).	840104	
380-007	324211 / 324158	c)Print error. Internal memory test in MPM: is failing when error supression. a)Necessary when 32 bit linedriver is used: b)Total reset function. Has to be done together with ECO:380-008 on 5151.	831128	
380-008 B	324351	Improvements of total reset function. Has to be done together with ECO:380-007 on 5411.	831222	
380-009	324352	Increased width of DATA READY on buffered write. Impossible to initiate all memory.	831213	*
380-010 B	324351	POWER FAIL does not work. BTOTRES-0 needs termination to STB voltage. (New version B of ECO:380-008).	840216	* *
380-011	324211 / 324158	Problems when bus are heavy loaded.	831129	
380-012 B	324211 / 324158	Replacement for ECO:380-007 and 380-011.	840216	
380-013	324351	Test and set may give timeout and Memory out of range.	831222	
380-014 B	324352	Test and set will not be possible through MPM5 linedriver(5154) to another MPM5 bank: (Dependent on ECO:380-018 on 5151.) (New revision C of ECO:380-002 and revision B of ECO:380-006).	840104	
380-015	324421	Remove termination from Aa4 BTOTRES-0.	840104	* *
380-016	324422	Remove termination from Aa4 BTOTRES-0. Powerfail/Restart may fail.	840104	*
380-017	329XX / 330XX / 331XX / 332XX / 333XX / 334XX	Change in programming counter AM9513, correspond to ECO-level H (ECO:380-013) for MPM5 CONTROLLER. Improvement In memory: testprogram. This version is to be used with MPM CONTROLLER ECO-version H or later.	840125	*
380-018 D	324351	Test and set will not be possible to another MPM5-linedriver(5154). (Dependent on ECO:380-014).(New rev.B of ECO:380-001):	840307	
380-019 B	324158/: 324211/: 324168	1) Fatal for large memories > 16Mbate. 2) Fatal for all systems.	840830	* * *
380-020	324351	Error in ECO:380-018.	840229	*
380-021 B	324211/: 324158/: 324168	To be sure to follow specifications for memory circuits.	840830	

ECO NO.	PART NO.	Volume-1 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
380-022	324351	Could cause hangup on the maintenance processor if it is used when the ports are running.	840404	*
380-023	324254	Timing improvements.	840227	
380-024	329XX 330XX 331XX 332XX 333XX 334XX	1.Maintenance program halts when removing console cable. 2.Error-investigator does not test ramboards in slot 1. 3.Inputparameters to RAM-test is changed to octal. 4.Addition of new command-value. 5.This version works with new port 5155.	840404	*
380-025 B	324352	Power Fail may not work without this correction.	840712	*
380-026	324351	Writing to EEPROM stops working in warm environments.	840529	*
380-027 B	324211 324158	Corrected memory error in Memory-Test. Marginal precharge timing.	840712	*
380-028 C	324211/: 324158/: 324168	Corrected memory error in Memory-Test. Marginal precharge timing.	840830	*
380-029	324354	Print error. Cc15 and Cc14 was exchanged. Cb15 and Cb14 was exchanged. Logical diagram is correct.	840813	
380-030	324352	MDR at address 100002 and Bank 23(Oct). Wrong when writing limits in IC's 2147H-1. Sometimes the returntime between address and writepulse became negative. This is been improved by delaying the writepulse (WLI-0).	840813	*
380-031	324351	Arrangement errors. Affects only options that are not in use.	840822	
380-032	354354	1.Powerfail does not work. 2.Timeout on refresh if Memory modules not present.	840822	* *
380-033 B	324158/: 324168/: 324211	Data Memory Parity Error specially with the F-version and heavy loaded bus.	840919	*
380-034	324351	Secure proper off-delay between cycles. Necessary if MPM5 32-BIT LINE DRIVER is used. Pullup on FLOATING TREQ-0.	841010	*
380-035	324354	Improved hold time on data on read cycles. Avoiding unnecessary enabling of data bus.	841010	*
380-036 B	324158/: 324168/: 324211	Dummy upgrading of version. (Ref. ECO:380-038)	841128	
380-037	329XX/ 330XX/ 331XX/ 332XX/ 333XX/ 334XX	1.Timeout after a power fail is corrected. 2.Defaultvalues for PORT-5155. 3.PORT START ADDRESS is displayed instead of PORT: BIASE in the command LIST-CONFIGURATION. 4.Lowercase letters allowed. 5.Initialization of FASTBUS is included.	841121	*
380-038	324158/: 324168/: 324211	Error in ECO:380-036. Dummy upgrading if revision B of ECO:380-036 is used.	841128	
380-039	324158/: 324168/: 324211	Syndrome test fails.	841204	*
380-040	324158/: 324211	Dummy upgrading of veresion. (Ref. ECO:380-039)	841204	

ECO NO.	PART NO.	Volume-1 SHORT DESCRIPTION	DATE ISSUED	FIELD ACTION
380-041	324355	Buserror, write parity on MPM5 CONSOLE.	841205	*
380-042	324158/ 324168/ 324211	Corrected memory error, and fatal memory error on some modules when MEMORY-C testprogram is running.	850110	*
380-043	324355	Arrangement error.	850110	



PART/PROM/PRINT - NUMBERS CROSS REFERENCE

LIST 1. PART NUMBERS RELATED

LIST 2. PROM NUMBERS RELATED

LIST 3. PRINT NUMBERS RELATED

ISSUED BY: TECHNICAL INFORMATION GROUP

REVISED: 850206

LIST 1. PART NUMBERS RELATED

PART No.	NAME	PRINT	PROM
324158	MPM5 DYNAMIC RAM 4MB	5411	322XX 323XX 324XX 325XX
324160	ND-500/2 & MPM5 EXTENSION CARD	5212	-
324168	MPM5 DYNAMIC RAM 1MB 120 ns	5411	322XX 323XX 324XX 325XX
324211	MPM5 DYNAMIC RAM 1MB 150 ns	5411	322XX 323XX 324XX 325XX
324251	SINGLE MPM5 C	5331	-
324252	DUAL MPM5 C	5333	-
324351	MPM5 CONTROLLER	5151	326XX 327XX 328XX 329XX 330XX 331XX 332XX 333XX 334XX 335XX 336XX 337XX 338XX
324352	MPM5 PORT	5152	339XX 340XX 341XX 342XX
324354	MPM5 32-BIT LINE DRIVER	5154	-
324355	MPM5 PORT	5155	-
324421	SINGLE MPM5 A	5321	-
324422	DUAL MPM5 A	5322	-
324431	SINGLE MPM5 B	5331	-
324432	SINGLE MPM5 D	5332	-
324433	DUAL MPM5 B	5333	-
324434	DUAL MPM5 D	5334	-

LIST 2. PROM NUMBERS RELATED

PROM	NAME	PRINT	PART
322XX	PARITY-CORRECTION	5411	324158 324168 324211
323XX	ERROR RESPONSE	5411	324158 324168 324211
324XX	I/O-ERR. REPORT	5411	324158 324168 324211
325XX	I/O-COMMAND DECODE	5411	324158 324168 324211
326XX	ADDR. DECODE 1	5151	324351
327XX	ADDR. DECODE 2	5151	324351
328XX	ADDR. DECODE 3	5151	324351
329XX	PROG. 1 LOW	5151	324351
330XX	PROG. 1 HIGH	5151	324351
331XX	PROG. 2 LOW	5151	324351
332XX	PROG. 2 HIGH	5151	324351
333XX	PROG. 3 LOW	5151	324351
334XX	PROG. 3 HIGH	5151	324351
335XX	SYNC. REFRESH	5151	324351
336XX	ONE AND ONLY ONE	5151	324351
337XX	ERROR DECODE	5151	324351
338XX	DTAC DECODE	5151	324351
339XX	I/O DECODE 1	5152	324352
340XX	I/O DECODE 2	5152	324352
341XX	ERROR RESPONSE	5152	324352
342XX	INTERL. COMPARE	5152	324352

LIST 3. PRINT NUMBERS RELATED

PRINT	NAME	PART No.	PROM
5151	MPM5 CONTROLLER	324351	326XX
			327XX
			328XX
			329XX
			330XX
			331XX
			332XX
			333XX
			334XX
			335XX
			336XX
			337XX
			338XX
5152	MPM5 PORT	324352	339XX
			340XX
			341XX
			342XX
5154	MPM5 32-BIT LINE DRIVER	324354	-
5155	MPM5 PORT	324355	-
5212	ND-500/2 & MPM5 EXTENSION CARD	324160	-
5321	SINGLE MPM5 A	324421	-
5322	DUAL MPM5 A	324422	-
5331	SINGLE MPM5 C	324251	-
	SINGLE MPM5 B	324431	-
5332	SINGLE MPM5 D	324432	-
5333	DUAL MPM5 C	324252	-
	DUAL MPM5 B	324433	-
5334	DUAL MPM5 D	324434	-
5411	MPM5 DYNAMIC RAM 4MB	324158	322XX
			323XX
			324XX
			325XX
5411	MPM5 DYNAMIC RAM 1MB 120 ns	324168	322XX
			323XX
			324XX
			325XX
5411	MPM5 DYNAMIC RAM 1MB 150 ns	324211	322XX
			323XX
			324XX
			325XX

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PARITY - CORRECTION 256 x 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
3 2 2 0 0	10A																				
ECO 380-																					

ERROR - RESPONSE 256 x 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
3 2 3 0 0	9A																				
ECO 380-																					

I/O - ERR REPORT 1K x 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
3 2 4 0 0	31E																				
ECO 380-																					

I/O - COMMAND DECODE 1K x 8 PAL

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
3 2 5 0 0	33E																				
ECO 380-																					

III-9-3

324158
324168
324169
324211

Corrected	Date	Sign
NO-380 [MPM5] MICROPROGRAM REGISTRATION SHEET STANDARD A.	Print no / Scale: 5411	Drawn BW 20.06.83
		Contr
		Page of
	Replacement for	
NORSK DATA A.S Oslo, Norway	Replaced by	

ADDR DECODE 1 512 x 4 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
32600	29D																							
ECO 380-																								

ADDR DECODE 2 512 x 4 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
32700	30E																							
ECO 380-																								

ADDR DECODE 3 256 x 4 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
32800	28E																							
ECO 380-																								

PROG 1 LOW 8K x 8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
32900	22C	B	C	D																				
ECO 380-		017	024	037																				

4-9-6-III

ID NO 324351

ECO 380-024 - 037	11.12.84.	OFITRo
Corrected	Date	Sign.

ND-380 (MPM5)
MICROPROGRAM REGISTRATION SHEET
STANDARD A

Print no.1 Scale 5151

Drawn GW 010783
Contr
Page 1 of 3

Replacement for

NORS[redacted] A.S
Os[redacted]ay

Replaced by

PROG 1 8K × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 3 0 0 0	18C	B	C	D																				
ECO 380-		017	024	037																				

PROG 2 LOW 8K × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 3 1 0 0	23C	B	C	D																				
ECO 380-		017	024	037																				

PROG 2 HIGH 8K × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 3 2 0 0	20C	B	C	D																				
ECO 380-		017	024	037																				

PROG 3 LOW 8K × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 3 3 0 0	22E	B	C	D																				
ECO 380-		017	024	037																				

III-9-5

ID NO 324351

ECO 380-024 - 037	11 12 84	of ITPo
Corrected	Date	Sign

ND-380 (MPM5)
MICROPROGRAM REGISTRATION SHEET
STANDARD A

Print no / Scale: 5151

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Replacement for

NORSK DATA A.S
Oslo, Norway

Replaced by

PROG 3 HIGH 8K × 8 PROM

A	Pos.	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 3 4 0 0	20E	B	C	D																				
ECO 380-		017	024	037																				

SYNC REFRESH 512 × 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 3 5 0 0	3F																							
ECO 380-																								

ONE AND ONLY ONE 512 × 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 3 6 0 0	138																							
ECO 380-																								

ERROR DECODE 32 × 8 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 3 7 0 0	310																							
ECO 380-																								

DTAC DECODE 512 × 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
3 3 8 0 0	29G																		
ECO 380-																			

ID NO 324 351

ECO380 04-037	11.12.84	OFITRo
Corrected	Date	Sign

ND-380(MPM5)
MICROPROGRAM REGISTRATION SHEET
STAND... A

Print no / Scale: 5151
Drawn BW 01.07.83
Contr.
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Replacement for
Replaced by

NORS... A.S
Oslo ... way

I/O DECODE 1 512 x 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 3 9 0 0	330																							
ECO 380-																								

I/O DECODE 2 512 x 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 0 0 0	320																							
ECO 380-																								

ERROR RESPONSE 1K x 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 1 0 0	310																							
ECO 380-																								

INTERL COMPARE 1K x 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 2 0 0	21H																							
ECO 380-																								

III - 5 - 6 - 7

ID NO 324352

Corrected | Date | Sign

ND - 320 [MPMS]
MICROPROGRAM REGISTRATION SHEET
STANDARD A

Print no / Scale
5152

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Oslo, Norway

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I/O DECODE 1 512 × 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 3 9 0 0	330																							
ECO 380-																								

I/O DECODE 2 512 × 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 0 0 0	32D																							
ECO 380-																								

ERROR RESPONSE 1K × 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 4 1 0 0	31D																							
ECO 380-																								

INTERL COMPARE 1K × 4 PROM

A	Pos	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
3 5 0 0 0	21H																							
ECO 380-																								

ID NO 324355

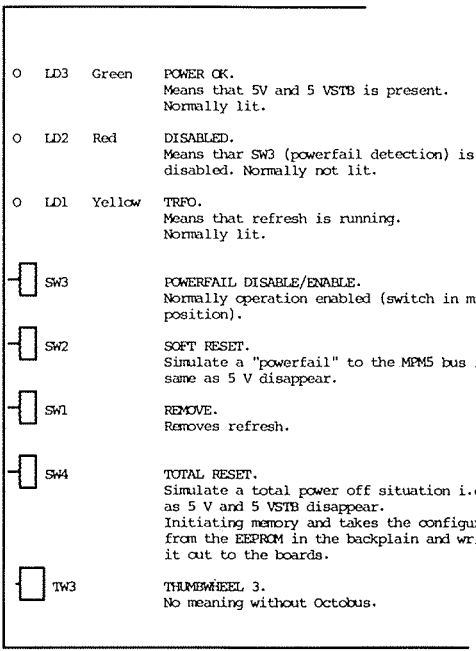
NO - 380 (MPM5)
MICROPROGRAM REGISTRATION SHEET
STANDARD A

5155

NORSK D[illegible]

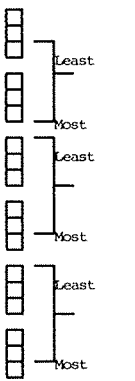
1 MPM5 indicators and switches.

2 MPM5 Controller (5151) board.



3 MPM5 Port (5152).

O	LD1	Red	PORT IN TEST OR NAVIB (not available). NAVIB can be programmed or hardwired XMINH i.e port is not connected to any driver.
O	LD2	Yellow	KREQ. Means request to port from a driver.
O	LD3	Yellow	MRQ. Means that address is ok and master request is send to the Controller.



Interleave port number
Not used (blank).

BASE (128 Kb units).
Calculated base according to lower limit,
startaddress and interleave.

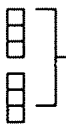
UPPER LIMIT (128 Kb units).

Not used.

LOWER LIMT (128 Kb units).

Not used.

4 MEMS Dynamic RAM (5411).



LOWER LIMIT (256 Kb units).

SIZE
Size 4 means model 425: 1Mb
Size 6 means model 427: 4Mb

O	LD4	Red	HARD ERROR. Means that the error investigator (runs from the controller) has found an error that has to be corrected for every cycle.
O	LD5	Red	BAD MEMORY. Not correctable error has been detected with address within this module. The content of the EEPROM remain even when board has no power and are only cleared with the INIT-EEPROM command.
O	LD1	Yellow	CORRECTED. Means that at least one error correction is done. Cleared by total or soft reset, power down or disable/enable SW1.
O	LD2	Green	ENABLED. Lits when error correction is enabled.
	SW1		ERROR CORRECTION ENABLE/DISABLE. Normal operation enabled (switch up).
O	LD3	Yellow	ACCESS. Means module is accessed with memory cycles.

5 MPM5 32 bit line driver.