REVISION RECORD

Revision	Notes
9/73	Total revision superceding all previous versions

ND-41.001.02

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A/S NORSK DATA-ELEKTRONIKK
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PREFACE

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The Software Catalog contains a description of standard software available from A/S Norsk Data-Elektronikk.

This catalog will be delivered with every NORD computer. Supplements or updated sheets will be sent out to the customers regularly. If updated properly, the Software Catalog will give full information about the latest released versions of available program tapes.

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THE ND SOFTWARE LIBRARY

Released program tapes are registered in the following two catalogs:

1) The PD catalog (PD = Program Deck) is a manual for internal use at ND. It contains a short description of every program tape which has been released. The tapes are filed in the PD library.

2) The Software Catalog (this manual) is for external and internal use. It contains Program Description forms for the current versions of standard program tapes which may be ordered from ND.

   In this catalog the Program Description forms are grouped according to software category.

   The Software Catalog is delivered with every NORD computer. Revisions to the catalog will be sent to the customers. It is then the users responsibility to update the catalog and remove obsolete forms.

RULES FOR SOFTWARE DELIVERY FROM A/S NORSK DATA-ELEKTRONIKK

Due to price and maintenance responsibility, ND distinguishes between the following four classes of software:

Class A:

Free Software delivered with the Computer

This software is maintained by ND and updated tapes and documentation will be sent free of charge. Extra copies of tapes or documentation may be ordered from ND at prices given in this manual.

Class B:

Software to Reproduction Price

This kind of software may be ordered from ND at prices given in this manual. Type B software is maintained by ND.

Class C:

Software to Reproduction Price but without Maintenance Responsibility

This kind of software may be ordered from ND at prices given in this manual. The delivery may include a symbolic tape, program listing and documentation.

If bugs are detected in type C software, ND does not guarantee that they will be corrected.

Class D:

Software Separately Priced

This software is maintained by ND. The prices will depend on royalty or development costs.

To which class software belongs may depend on core size, peripheral equipment or the actual contract.

Two complete sets of documentation and one set of program tapes - as specified for each particular configuration - will follow the computer. It is strongly recommended to make a copy (for daily use) of all the tapes received.

Extra tape copies or documentation may else be ordered from ND. Prices are found in the Software Catalog. The prices are meant to cover our own reproduction costs.

The program deck prices for type D software found in the reference tables of this catalog are the prices for extra tape copies and not the prices for the software products themselves.

ORDERING OF PROGRAM TAPES OR DOCUMENTATION

This should be done by sending a written order to the software division of A/S Norsk Data-Elektronikk. Necessary information is the titles of the wanted manuals and the PD numbers and program name of the wanted tapes. Delivery time will normally be one to two weeks.

WHOM TO CONTACT AT ND

Product:	Whom to contact:
MAC SYSTEM	R.J. Olsen T. Glavin
NORD FORTRAN SYSTEM	T. Matre K. Osttveit T. Glavin
SINTRAN SYSTEM	H.K. Dahl T. Matre H. Madsen K. Nordbye
NORD-OPS	K. Nordbye T. Glavin
FILE SYSTEMS	K. Nordbye H. Madsen B. Lewendal
PLOT PACKAGE	T. Glavin R.J. Olsen
BASIC	R.J. Olsen J. Håberg
TRAM	R.J.Olsen
TIMESHARING SYSTEM - TSS	B. Lewendal T. Glavin O. Lange
UTILITY PROGRAMS - EDITORS	H.K. Dahl B. Lewendal
NORD-20 SPECIAL SOFTWARE	H.K. Dahl T. Paulsen H. Eide
ALARMSCAN - PROCESS CONTROL PACKAGES	T. Matre H. Eide H. Madsen
CORE ORIENTED REAL TIME MONITORS	H. Eide T. Matre

Product:	Whom to contact:
REMOTE JOB ENTRY - DATA TRANSMISSION	H. Madsen J. Håberg N.J. Liaaen T. Paulsen
HARDWARE TEST PROGRAMS	T. Paulsen E. Jergan
For further information, contact the secretary at the Software Division	Aud Sæstad

DOCUMENTATION AVAILABLE FROM ND

Program Descriptions for Hardware Equipment

Title:	Date of Current Version:	Price in nkr:
Arithmetic Unit for the NORD-5	June 1972	20
Cartridge Disc System	September 1972	15
Disc System for NORD-1 - Programming Specifications	January 1971	10
Input/Output for Slow Devices	June 1971	10
Intercore Module - Programming Specifications	February 1972	10
Interrupt & Memory Protection System	May 1972	20
Magnetic Tape System via Data Channel - Programming Specifications	January 1972	20
Modem Interface	April 1970	25
NORD-1 Reference Manual	February 1970	25
NORD-10 Reference Manual	May 1973	40
NORD-10 Input/Output System	March 1973	25
NORD-20 Reference Manual	November 1972	25
NORD-10 Input/Output Reference Manual	June 1972	20
NORD-1/NORD-5 Communication System	December 1971	10
NORD-5 Instruction Set	September 1971	20
Virtual Memory System for NORD-1	February 1971	10

Software Descriptions

Title:	Date of Current Version:	Price in nkr:
Assembler for NORD-5	April 1972	20
All Core Monitor	September 1969	10
BASIC Reference Manual	January 1973	40
Binary Relocating Loader - BRL	January 1973	15
Brukerinstruks til NORD TSS	June 1972	10
Brukerintroduksjon til QED	June 1972	10
Cassette Tape System - CATSY Programming Manual	March 1972	
Cassette Tape System - CATSY Service Program	March 1972	
Conversational Editor	May 1970	20
Data Channel Test Program	February 1972	15
DCT 2000 Operators' Guide	July 1973	10
Disc Maintenance System		
Dokumentasjon til dobbelt presisjon flytende software	March 1970	10
Extensions to the NORD-1 Conversational Editor	February 1972	10
FIO - FORTRAN Formatted Input/Output System	February 1971	15
Floating Point Subroutines	July 1969	15
FORTRAN II	September 1972	15
FORTRAN Translator for a Small Computer	February 1969	15
Generating SINTRAN II	February 1973	20
GERTS 115 Operator's Guide	January 1973	15
Instruction Check II for NORD-20	May 1972	10
MAC Users' Guide Revision A to MAC Revision B to MAC	June 1971 October 1971 May 1973	40
MACD - MAC Debugging Assembler	November 1970	10
MACM - MAC Mass Storage Assembler	February 1972	15
MESYS Reference Manual	February 1972	10
MGEN - Data Generator for MESYS	January 1972	10
MINIMON Reference Manual	May 1971	10

Title:	Date of Current Version:	Price in nkr:
ML-EDIT - A Multi-level Editor	June 1972	15
NORD BASIC Abstracts	October 1972	15
NORD Plot Package	September 1972	15
NORD Binary Card System		15
NORD Commercial Subroutine Package	March 1972	10
NORD FORTRAN IV Debugging Option Users' Guide	January 1973	5
NORD FORTRAN IV Reference Manual	January 1973	40
NORD-OPS Reference Manual	August 1973	35
NORD-5 BRF Loader	June 1972	20
NORD-5 FORTRAN - Program Documentation	June 1972	20
NORD-5 Test System	March 1972	15
Program for påføring av kommentartekst	January 1970	10
QED Users Manual	February 1972	20
Re-entrant FORTRAN Mathematical Library	June 1971	40
Scientific Subroutine Package	September 1972	70
SINTRAN II Operator's Guide	February 1973	25
SINTRAN II Real Time Loader	February 1973	25
SINTRAN II Users Guide	February 1973	35
Special Software for NORD-20	September 1972	15
Standard Input/Output System - NORD-20	February 1972	15
Test Programs	April 1970	15
TRACE Routine	August 1973	15
TRAM Reference Manual	June 1970	15
TSS Reference Manual	February 1973	20
Users Manual for Memory Check		10
Users Manual for PERMI		10
200 User Operator's Guide	January 1973	15

PROGRAM DESCRIPTION FORMS

The following information is found on this form:

Program Name is selfexplanatory.

Description gives a short description of the program.

Documentation gives a list of available documentation.

Available Versions gives a survey of available versions of a program and the differences between them. Note if a program exists in several modes (formats) - for example symbolic, BRF, binary etc. this is not different versions. There should be differences in the program itself and not in the tape format used.

Usually a symbolic tape will consist in only one version. (If so, it will be specified as symbolic without version number.) But from this tape one may in some cases assemble several different binary program versions. The tape may contain library marks for conditional assembly, or some labels may be defined at assembly time (for example device numbers, table sizes etc.) Available versions and program modes are found in the "Program Reference Lists".

Program Size gives the (approximately) size of the program (as a decimal number). As some programs are modular, the size may be given as a minimum and a maximum value.

CPU Requirements tells on what type(s) of computer(s) the program may be run (NORD-10, NORD-1, NORD-2B, NORD-20, NORD-5).

Peripheral Requirements tells if such equipment is necessary (N) or recommended (R) to use the program.

Software Requirements tells which (if any) other programs are necessary to use this program.

Source Language tells which programming language is used for the symbolic mode of the program (MAC, FORTRAN II, NPL etc.)

Other Comments may be used for additional information not covered by the former items.

PROGRAM REFERENCE LIST

This list contains the following information:

- A reference between the "Program Descriptions" given by "Page" and the identification number "Tape Ident." to the newest version of this program in ND's program library. Available versions and formats (Mode) are listed.

- Prices.

  The prices given are reproduction prices and do not cover royalty (Class D software) or installation costs for systems (for example TSS, RJE packages etc.) where assistance from ND may be necessary.

Mode

Programs are normally delivered on paper tape. Card Decks magnetic tape etc. may be delivered according to a special agreement. The following abbreviations are used to describe the different program formats.

SM	Symbolic MAC code
SBC	Basic (symbolic)
SF2	FORTRAN II (symbolic)
SF4	FORTRAN IV (symbolic)
OC	Octal format. (Octal dump of program.)
B	Standard NORD-1 binary tape. (Not relocatable.)
B20	Standard NORD-20 binary tape.
B2S	Special NORD-20 binary tape.
BRF	Standard NORD BRF (Binary Relocatable Format) tape. (BRF tapes may be linked together by the loader as they may contain external undefined references.)
RB	Standard NORD RB format (Relocatable Binary) which consists of a relocatable bootstrap (miniloader) followed by a compressed BRF tape. (RB tapes cannot be linked together as external references are not allowed in the BRF part.)
CDS	Card Deck containing a symbolic program.
CDB	Card Deck containing a binary program.
L	Listing.

Further information about the formats mentioned is found in ND's software documentation.

1 RELOCATING LOADER

The NORD compilers, assembler (MAC), etc. produce output in a Binary Relocating Format called BRF. This is a standard tape format for the NORD computers. Program units in this format may be relocated in core or linked together by a program called BRL - Binary Relocating Loader.

FORTRAN systems may be delivered with a loader (RB or binary format) which (to save time) may consist of BRL plus the FORTRAN run time system. See Chapter 10.

The SINTRAN system makes use of a special loader call RT Loader. see Chapter 20.

PROGRAM DESCRIPTION

Program Name : BRL (Binary Relocating Loader)

Description : BRL is a program for relocating program units in BRF format in core, or/and linking program units in BRF format together.

Documentation : Binary Relocating Loader

Available Versions :

V1: BRL for NORD-1/NORD-20

V2: BRL for NORD-10

V3: BRL for TSS

V4:

Program Size : Approx. $2200_{(8)}$

CPU Requirements : V1: NORD-1 or NORD-20
V2: NORD-10
V3: NORD-1 or NORD-10

Peripheral Requirements : Teletype, paper tape reader

Software Requirements : If NORD-20: N1SIM
If V3: TSS

Source Language : MAC

Other Comments :

2 MAC ASSEMBLY AND DEBUGGING SYSTEM

MAC is the symbolic machine language and assembler for the NORD computers (except NORD-5). The design philosophy has been to integrate the assembly function and the different debugging aids into one system.

MAC has the capability to accept code in the MAC language and to assemble the MAC code into binary machine code to be used for program execution. Once the program has been assembled and loaded, MAC has also the capability to examine and change the program and to perform many functions normally associated with an interactive debugging system.

The nucleus of the system, Basic MAC, is a minimum assembler which is capable of assembling its own extensions.

MAC is a one pass assembler that can assemble programs either directly into core, or produce output in a binary relocatable format. (Basic MAC may be extended to a two pass assembler by adding an option.) This format, NORD BRF format, is standard output format for FORTRAN, RT-FORTRAN compilers as well. Thus, programs written in assembly code or FORTRAN/RT-FORTRAN code may be linked together. The NORD BRF loader takes care of this coupling.

Basic MAC with its options that produces other than BRF format (Software Summary 1st of August 1970), will no longer be kept up. These versions will be available on special request only.

Complete assembly systems are delivered on BRF library tapes containing the following parts:

SMBRF 3	standard tables
SMBRF 4	)ZERO,)CORE,)PCL,)LIST,)CHANGE options
SMBRF 5	breakpoint
SMBRF 7	decimal mode
SMBRF 8	assembly of floating point numbers
SMBRF 10	disassembler
SMBRF 19	two pass assembly
SMBRF 20	macroes
SMBRF 27	trace
SMBRF 28	ML-EDIT
SMBRF 30	)9READ,)9TABL,)FIX,)9SCLC,)9RCLC options
IOLIB	standard input/output routines
SMBRF 1	basic MAC

The user may choose options and build an extended assembler - debugging system according to his need, and generate own binary versions. The loading procedure is described in the documentation MAC Users Guide.

Symbolic tapes are delivered on special request only.

MAC is available in the following main versions:

- Standard MAC core version.
- Standard MAC as a TSS subsystem
- Standard MAC as a NORD-OPS subsystem
- MACF - Special MAC version for TSS which may operate on a 64K core image (file).
- MACM which may assemble on core images on disc or drum. (Free-standing MAC version.)
- MACD which is a special SINTRAN MAC version used for debugging purposes.

NORD-1 versions of MAC may also be used on NORD-20.

PROGRAM DESCRIPTION

Program Name : MAC II (Stand alone systems)

Description : MAC is the symbolic machine language and assembler for the NORD computers.

Documentation : MAC Users' Guide
The Trace Routine (Trace option, SMBRF 27)
ML-EDIT (Edit option, SMBRF 28)

Available Versions :

V1: NORD-1 version BRF
V2: NORD-10 version BRF
V3:
V4:

Program Size : Modular 6K - 11.5K (standard tables included)

CPU Requirements : NORD-1 or NORD-20 (V1)
NORD-10 (V2)

Peripheral Requirements: Teletype, paper tape reader.
Recommended: paper tape punch

Software Requirements : If NORD-20: N1SIM, else none

Source Language : MAC

Other Comments : A BRL in RB format is the first program unit on this program deck (tape).

Binary versions may be available on request.

PROGRAM DESCRIPTION

Program Name : SHORT MAC II

Description : Stripped MAC II version which may be used on a 4K NORD-20. One version (V2) contains the obsolete outmode option. This MAC don't assemble to core but will punch the assembled program in a special binary format.

Documentation : MAC Users' Guide

Available Versions :

V1: Short MAC II

V2: Short MAC II with outmode

V3:

V4:

Program Size : Approx. 3.5K

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements : Teletype, paper tape reader.
Recommended: paper tape punch

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments : Note:
Short MAC II will not be maintained by ND.
In outmode positive displacements are not checked for range exceeded.

PROGRAM DESCRIPTION

Program Name : MACM

Description : MACM is a MAC version which assembles object code to core image on disc or drum. The user may, however, freely change between MACM and his own program.

The available versions are stand alone systems.

Documentation : MAC Users' Guide
MACM - MAC Mass Storage Assembler

Available Versions :

V1: MACM, BRF

V2: DYNAMACM, NORD-1, binary

V3: DYNAMACM, NORD-10, binary

V4:

Program Size : Approx. 16K

CPU Requirements : NORD-1 (V1, V2), NORD-10 (V3)

Peripheral Requirements: Teletype, paper tape reader, paper tape punch, disc or drum

Software Requirements : UBP for running breakpoint

Source Language : MAC

Other Comments : MACM is used to assemble SINTRAN systems. A BRL in RB format is the first program unit on the tape V1.

PROGRAM DESCRIPTION

Program Name : UBP

Description : User Break Point for DYNAMACM. UBP must be assembled together with user program on mass memory.

Documentation : MACM - MAC Mass Storage Assembler

Available Versions :

V1:	UBP 0	Drum
V2:	UBP 1	NCR disc
V3:	UBP 2	CDC disc
V4:		

Program Size : Approx. 300_8

CPU Requirements : NORD-1

Peripheral Requirements : Teletype, paper tape reader, drum or disc

Software Requirements : DYNAMACM

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : MAC II (TSS subsystems)

Description :

Documentation : MAC Users' Guide
The Trace Routine

Available Versions :

V1: MAC TSS, BRF

V2: MAC 24K, binary

V3: MAC 32K, binary

V4: MAC TSS NORD-10, BRF

Program Size : Modular 6K -12K (standard tables included)

CPU Requirements : NORD-1, NORD-10 (V4)

Peripheral Requirements: Teletype, paper tape reader, disc

Software Requirements : NORD TSS
BRL (TSS) for V1 and V4

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : MACF (TSS subsystem)

Description

MACF (MAC File) is a special version of MAC which operates on a 64K (maximum) random file. The main purpose of MACF is to allow the user to build systems anywhere in memory.

The available versions are TSS subsystems.

Documentation : MAC Users' Guide
The Trace Routine

Available Versions :

V1: MACF 24K, binary

V2: MACF 32K, binary

V3: MACF 24K NORD-10, binary

V4: MACF 32K NORD-10, binary

Program Size : 12K (V1, V3), 16K (V2, V4)

CPU Requirements : NORD-1 (V1, V2)
NORD-10 (V3, V4)

Peripheral Requirements: Teletype, paper tape reader, disc

Software Requirements : NORD TSS

Source Language : MAC

Other Comments :

4 EDITORS - UTILITY PROGRAMS

Editors and other utility programs are available both as free-standing versions and as subsystems to the operating systems.

Editors

The following editors are available:

a)	QED	(Minimum core 12K)
b)	Conversational Editor	(Minimum core 4K)
c)	EDIT	(Minimum core 4K)

a) and b) are conversational. c) is an off-line editor.

QED is the standard editor delivered by ND. and it is recommended to use QED if a 12K (or more) computer is available.

EDIT is an option to MAC but may be delivered as a free-standing program on special request.

PROGRAM DESCRIPTION

Program Name : QED Text Editor

Description : QED is a program for editing symbolic text which runs on NORD computer with or without mass storage. It has extensive facilities for inserting, deleting and changing lines of text, a line edit feature, a powerful symbolic search feature, automatic tasks which may be set by the user, and a substitute command which permits all occurences of a specified string of characters to be replaced by another string. Text may be read from any file and written onto any file.

Documentation : QED Users Manual
Brukerintroduksjon til QED (Norwegian)

Available Versions :

V1: NORD-1 version (free-standing)

V2: NORD-10 version (free-standing)

V3: TSS subsystem

V4:

Program Size : At least 12K with buffers

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, tape punch

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : NORD Conversational Editor

Description : Editor for source programs in ASCII code. NORD Conversational Editor may be running as an RT program in a SINTRAN II system.

Documentation : Conversational Editor
Extensions to NORD Conversational Editor

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 1K + buffer

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, tape punch

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : BRF Handler

Description : Program to compress BRF programs, to link BRF programs and to generate programs from BRF format to RB format. (BRF with relocatable bootstrap.)

Documentation : PD-catalog

Available Versions :

V1: NORD-10 version

V2: NORD-1 version

V3: TSS subsystem

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, tape punch

Software Requirements : If NORD-20: N1SIM
The symbolic tape refers to Standard I/O

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : Cross Reference List Program (KRYSSREF)

Description : A source file is read by the program and listed on another file (or device). Every line on the listing will start with a decimal line number. Every page will start with a heading and a page number. When the file(s) is (are) read, a listing of all the symbols of the source file(s) is (are) printed, with reference to the lines on which the symbols occurred. The symbols will be printed in alphabetic order, and the program will distinguish between defined and redefined symbols.

Documentation : PD-catalog

Available Versions :

V1: KRYSSREF for NORD TSS

V2: KRYSSREF for NORD-OPS

V3: KRYSSREF for Centronics printer

V4:

Program Size : Approx. 2K + tables

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, printer

Software Requirements : V2: NORD-OPS system
V1: NORD TSS
If NORD-20: N1SIM

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : Commentary Text

Description : The programs and the commentaries may be written separately and edited together with the use of this program.

Documentation : "Program for påføring av kommentartekst" (Written in Norwegian.)

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 2K

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, tape punch

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : DIMS

Description : Disc maintenance system
(copy, compare, verify, change, dump)

Documentation : Disc Maintenance System

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1

Peripheral Requirements: NCR disc, tape reader, Teletype

Software Requirements :

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : CTAP9 - Catsy Service Program

Description : The Cassette Service Program provides convenient means to test, format and examine CATSY Cassette tapes.

Documentation : Cassette Tape System - Catsy Service Program

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, Catsy 100

Software Requirements : Catsy Utility Routines

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : COPY and VERIFY

Description : Program used to copy paper tapes and verify the copy.

Documentation : Conversational program

Available Versions :

V1:

V2:

V3:

V4:

Program Size : 1640_8 + buffer area

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements : Tape reader, tape punch, Teletype

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : 2BPUN

Description : A program which may be used to dump a core area in NORD-1 or NORD-20 standard binary tape format.

Documentation : Special Software for NORD-20

Available Versions :

V1:

V2:

V3:

V4:

Program Size : $151_{(10)}$

CPU Requirements : NORD-20 or NORD-1

Peripheral Requirements: Tape reader, tape punch, Teletype

Software Requirements : 2BCOM if NORD-20

Source Language : MAC

Other Comments :

10 THE NORD FORTRAN SYSTEM

The FORTRAN system for the NORD computers can be divided into three groups:

FORTRAN IV
FORTRAN II
MINI FORTRAN

When selecting a system, it should be taken into account the available core space and the features wanted.

As a main rule we may say:

- For computers with 12K or more : Use FORTRAN IV
- For the NORD-1 computer with 8K : Use FORTRAN II
- For the NORD-20 computer with 8K : Use MINI FORTRAN

NORD computers with 4K cannot execute FORTRAN programs. Available compilers use from 6 to 12K of core.

At present programs that are compiled by different compilers must not be mixed up.

The three systems will be delivered as a set of three tapes consisting of:

Loader (BRL)
Compiler
Run-time system

The user is advised to make a binary version of his run-time system as soon as possible. The method for doing this is described in the NORD FORTRAN IV Reference Manual.

On request and at an additional charge ND may furnish binary systems placed where the user wants them.

An RT version giving object programs executable under control of the SINTRAN real-time monitor is available for FORTRAN II and IV. Those FORTRAN versions are called RT-FORTRAN II and IV (RT-FORTRAN = Real Time FORTRAN).

Only FORTRAN IV may be run under control of the batch operating system NORD-OPS.

10.1 The NORD FORTRAN IV System

The system consists of:

FORTRAN IV Compiler
FORTRAN IV Run-time system

No mixture with other FORTRAN system versions are permitted.

PROGRAM DESCRIPTION

Program Name : FORTRAN IV Compiler (NORD-1 versions)

Description : This is the standard FORTRAN IV version of the compiler. It produces non-re-entrant object code which can be loaded by FORTRAN IV loader only.

Documentation : NORD FORTRAN IV Reference Manual

Available Versions :

V1: BRF NORD FORTRAN IV compiler (BRF-format)
V2: FORTRAN IV compiler, N - new standard device numbers
V3: FORTRAN IV compiler, O - old device numbers
V4: TSS FORTRAN IV compiler, 24K
V5: TSS FORTRAN IV compiler, 32K
V6: NORD-OPS FORTRAN IV compiler

Program Size : Approx. 13K (easy to change for 12K)

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements : Teletype, paper tape reader, paper tape punch

Software Requirements : If NORD-20: N1SIM
V1: BRL
V4 and V5: TSS

Source Language : MAC

Other Comments : Old device numbers: hardware device no. 67 for line printer and hardware device no. 4 and 5 for Teletype 2. New standard device numbers: hardware device no. 167 for line printer and hardware device no. 104 and 105 for Teletype 2.

PROGRAM DESCRIPTION

Program Name : FORTRAN IV Run-time System

Description : FORTRAN IV run-time system consists of:

FORTRAN IV Library
FORTRAN IV Run-time routines
FORTRAN IV Formatting program (FIO)
IOLIB

Documentation : Re-entrant FORTRAN Mathematical Library
NORD FORTRAN IV Reference Manual

Available Versions :

V1: NORD FORTRAN IV run-time system, BRF non-compressed without I/O-lib

V2: FORTRAN IV run-time system, N - new standard device nos.

V3: FORTRAN IV run-time system, O- old device nos.

V4: FORTRAN IV run-time system for NORD-OPS

Program Size : Maximum somewhat less than 4K

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, paper tape reader

Software Requirements : If NORD-20: N1SIM
BRL

Source Language : MAC

Other Comments : Old device numbers: hardware device no. 67 for line printer and hardware device no. 4 and 5 for Teletype 2. New standard device numbers: hardware device no. 167 for line printer and hardware device no. 104 and 105 for Teletype 2.

PROGRAM DESCRIPTION

Program Name : FLDR (TSS subsystem)

Description : The tape consists of standard BRF loader (BRL) plus the FORTRAN IV run-time system and library. This version may be used instead of BRL to save time (not necessary to load library) at the cost of core used. (Whole library is always included.)

Documentation :

Available Versions :

V1: FORTRAN IV Loader for TSS - 24K

V2: FORTRAN IV Loader for TSS - 32K

V3:

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements:

Software Requirements : TSS

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : NORD FORTRAN IV Debugging Option

Description : This option may be used to set break points, examine and change variables and trace FORTRAN IV programs.

Documentation : NORD FORTRAN IV Debugging Option Users' Guide

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, paper tape reader

Software Requirements : NORD FORTRAN IV Compiler, BRL FORTRAN IV Run-time system.
If NORD-20: N1SIM.

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : RT-FORTRAN IV Compiler

Description : A FORTRAN IV Compiler that produces object code for running in a SINTRAN II system as RT-programs.

Documentation : NORD FORTRAN IV Reference Manual

Available Versions :

V1: RT-FORTRAN IV compiler, O - old device numbers

V2: RT-FORTRAN IV compiler, N - new device numbers

V3:

V4:

Program Size : Approx. 12K

CPU Requirements : NORD-1 or NORD-20.

Peripheral Requirements : Teletype, paper tape reader, paper tape punch

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments : RT-FORTRAN IV Compiler may run as an RT-program under a SINTRAN II system, or as a stand alone version.

PROGRAM DESCRIPTION

Program Name : RT-FORTRAN IV Run-time System

Description : This tape consists of:

FORTRAN Run-time system routines
FORTRAN Mathematical Library
FORTRAN Formatting program (FIO)
FORTRAN Bit operation routines
FORTRAN 8PAUSE and 8STOP

Documentation : NORD FORTRAN IV Reference Manual

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, paper tape reader

Software Requirements : SINTRAN II system with loader

Source Language : MAC

Other Comments :

10.2 The FORTRAN II System

This is a standard FORTRAN II system with the following additional features:

- Complete run-time check on actual formal parameters.
- Re-entrant object code and dynamic allocation of local variables.
- GLOBAL statement

Due to the run-time check on parameters, the FORTRAN II object code executes much slower than the corresponding FORTRAN IV object code. The system consists of:

FORTRAN II Compiler	- BRF with relocatable bootstrap
FORTRAN II Run-time System	- BRF

PROGRAM DESCRIPTION

Program Name : FORTRAN II Compiler

Description : A FORTRAN Compiler that produces recursive coding. This version cannot be used with the SINTRAN monitor.

Documentation : FORTRAN II

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, paper tape reader, paper tape punch

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : FORTRAN II Run-time System

Description : The run-time system for FORTRAN II consists of:

FORTRAN II Run-time routines
FORTRAN Mathematical Library
FORTRAN Formatting routines (FIO)

Documentation : Re-entrant FORTRAN Mathematical Library
FIO - FORTRAN Formatted Input/Output System.

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, paper tape reader

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : FORTRAN II Loader

Description : A core oriented loader used to load programs produced by either FORTRAN II, RT-FORTRAN II or MAC II

For the most part this loader can be replaced by the standard loader BRL. However, the FORTRAN II loader is less space consuming.

Documentation : NORD FORTRAN SYSTEM Reference Manual
FORTRAN II
MAC Users' Guide

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements : Teletype, paper tape reader

Software Requirements : If BRF version: BRF IOLIB
If NORD-20: N1SIM

Source Language : MAC

Other Comments :

10.3 The RT-FORTRAN II System

This is the SINTRAN version of the FORTRAN II system. If wanted, the compiler may be run under control of the SINTRAN monitor. This means that the SINTRAN coreload must be at least as great as the compiler, e.g., 8K. A version with smaller tables may be delivered on request.

The system consists of:

- RT-FORTRAN II Compiler - BRF (called RT COM ONL)
- RT-FORTRAN II Run-time system - BRF (called RT LIBR ONL)

PROGRAM DESCRIPTION

Program Name : RT-FORTRAN II Compiler

Description : A compiler that produces object code capable of running under the SINTRAN monitor as RT-programs.

Documentation : NORD FORTRAN System Reference Manual
FORTRAN II

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements : Teletype, paper tape reader

Software Requirements : BRF IOLIB,
If NORD-20: N1SIM

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : RT-FORTRAN II Run-time System

Description : A real time library for use with object code produced by RT-FORTRAN II Compiler. This run-time system may be running under the SINTRAN monitor.

Documentation : Re-entrant FORTRAN Mathematical Library
FIO - FORTRAN Formatted Input/Output System.

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, paper tape reader

Software Requirements : NONE

Source Language : MAC

Other Comments :

10.4 The MINI FORTRAN System

This system is mainly intended for NORD-20 computers with 8K memory sizes. It can also be used by those who want a minimal FORTRAN system with a small run-time system.

The following restrictions exist, compared with the FORTRAN II version:

- The size of the program units is limited
- EXTERNAL statement is not implemented
- Labeled common is not implemented
- Implied DO loops in I/O statements cannot cover more than one data item.
- Arrays or program units cannot be used as parameters
- Array elements can only be used as value parameters, e.g., they do not change during execution of the called program unit.

This system cannot be used under control of NORD-OPS or SINTRAN.

The system consists of:

The BRF Loader BRL (see MAC)
MINI FORTRAN Compiler
MINI FORTRAN Run time system

PROGRAM DESCRIPTION

Program Name : Mini FORTRAN Compiler

Description . Mini FORTRAN II Compiler

Documentation : NORD FORTRAN SYSTEM Reference Manual

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 7K

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, paper tape reader, paper tape punch

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : Mini FORTRAN Run-time System

Description : Run-tine system for programs produced by the Mini FORTRAN Compiler. The tape consists of:

Mini FORTRAN run-time routines
Mathematical Library
Formatting Input/Output routines
IOLIB

Documentation : Re-entrant FORTRAN Mathematical Library
FIO - FORTRAN Formatted Input/Output System

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, paper tape reader

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments :

11 NORD BASIC

The BASIC system is available in the following versions:

1 NORD Timesharing System

This system is a general timesharing system with independent subsystems of which BASIC is one. All subsystems under NORD TSS use a common file system.

2 NORD BASIC Timesharing System

A BASIC compiler and run-time system with a monitoring routine.

3 NORD BASIC with Link Option

A BASIC compiler and run time system which may call sub-routines coded in MAC (the NORD-1 assembly language) or in FORTRAN. This provides the system with quite special features of which plotter control and process control are the most remarkable. The system may be run under NORD TSS.

4 NORD BASIC One User System

A compiler and run-time system for BASIC; may also be used as background version for the SINTRAN operating system.

PROGRAM DESCRIPTION

Program Name : BASIC for NORD TSS

Description : BASIC compiler and interpretative run time system. Uses the I/O system and file system in NORD Time-sharing System

Documentation : NORD BASIC Reference Manual

Available Versions :

V1: For 12K TSS (BASIC from address 30000)

V2: For 16K TSS (BASIC from address 40000)

V3:

V4:

Program Size : Approx. 8K

CPU Requirements : NORD-1, NORD-10

Peripheral Requirements: Teletype, tape reader

Software Requirements : NORD TSS

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : BASIC Multiuser

Description : BASIC compiler and interpretative run time system with monitoring routines. The I/O system may handle up to 8 users (V1); 4 users (V2, V3)

Documentation : NORD BASIC Reference Manual

Available Versions :

V1: NORD-1 Version

V2: NORD-20 Version inclusive MAT

V3: NORD-20 Version exclusive MAT

V4:

Program Size : Approx. 9K

CPU Requirements : NORD-1 (V1)
NORD-20 (V2, V3)

Peripheral Requirements: Teletype, tape reader

Software Requirements :

Source Language : MAC

Other Comments : NB! For V2 and V3 contact the software division to check that the device numbers on the tapes may be used on your NORD-20 configuration

PROGRAM DESCRIPTION

Program Name : BASIC with Link Option

Description : BASIC compiler and interpretative run time system. This system may load and run subroutines coded in MAC or FORTRAN. This system uses the I/O system and the file system in NORD TSS (V1)

Documentation : NORD BASIC Reference Manual

Available Versions :

V1: 32K Version for TSS

V2: One User Version for NORD-1/NORD-20

V3: One User Version for NORD-10

V4:

Program Size : Approx. 10K (V1), 9K (V2, V3)

CPU Requirements : NORD-1, NORD-20, NORD-10

Peripheral Requirements: Teletype, tape reader

Software Requirements : NORD TSS (V1), upper N1SIM if NORD-20 (V2)

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : BASIC One User

Description : BASIC compiler and interpretative run time system

Documentation : NORD BASIC Reference Manual

Available Versions :

V1: NORD-1/NORD-20 Version

V2: NORD-10

V3:

V4:

Program Size : Approx. 7K

CPU Requirements : NORD-1, NORD-10, NORD-20

Peripheral Requirements: Teletype, tape reader

Software Requirements : Upper N1SIM if NORD-20 (V1)

Source Language : MAC

Other Comments :

19 TRAM

TRAM is an arithmetic interpreter whose design objectives have been to generalize the programmable desk calculator concept.

TRAM, as seen from the Teletype, is a new conversational programming language which resembles ALGOL and FORTRAN in the syntax of the arithmetic statements.

The user may define recursive macroes.

It consists of a core resident re-entrant interpreter connected to a small time sharing monitor which performs the input/output on one or more Teletypes. The individual users have separate data areas in core. Several users may have direct access to the interpreter at the same time on a time sharing basis.

Core requirements depend on the size of the function library, availability of floating point hardware and the size of the user data areas. A typical configuration is 2000 words for interpreter with library, 500 words for the monitor and 300 words for each user. Thus, a 4K configuration may accept 4-5 simultaneous users.

This is a type C, software product.

PROGRAM DESCRIPTION

Program Name : TRAM

Description : Timeshared Reactive Arithmetic Macro System, TRAM, is an arithmetic interpreter whose design objectives have been to generalize the programmable desk calculator concept.

Documentation : TRAM Reference Manual

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 3500_8

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements : Teletype, tape reader

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments :

20 THE SINTRAN SYSTEM

The SINTRAN system consists of a monitor, a compiler, a loader with library and an assembler.

The SINTRAN monitor is a real-time multi-programming operating system for the NORD-1 computer. The minimum system is core resident, but it may be extended to a mass storage oriented system.

The monitor controls the execution of a number of user programs. Execution of a program may start at a given time or as a result of an external interrupt. Execution may also be interrupted by programs of higher priority.

The real-time FORTRAN compiler is a revised version of a FORTRAN II compiler. Some new statements are introduced, and the object code is re-entrant. This compiler makes it easy to program real-time applications.

The MAC assembly language may also be used for programming.

The main application area is considered to be process control, but other real-time applications should also be covered.

The prices listed here is for copies of the program decks, category B.

If SINTRAN is not included in the contract, there is a fee of nkr 10.000,- which is a category D fee and includes the necessary program decks.

The SINTRAN Monitor system consists of the following tapes:

SINTRAN Monitor (3 tapes)

SINTRAN Basic I/O system

SINTRAN Operator Communication

To run RT-FORTRAN under the SINTRAN Monitor system, the following tapes must be used:

Real-time FORTRAN Compiler (FORTRAN II or FORTRAN IV)

Real-time Loader for mass storage systems or SINTRAN II all core loader for core systems.

FORTRAN run-time and mathematical library

To assemble and debug real-time programs under the SINTRAN Monitor system, the program MACD must be used.

To assemble program to BRF format, the MAC II assembler may be used as a real-time program.

To edit symbolic decks in the SINTRAN system, the NORD-1 Conversational Editor, Version III may be used.

To assemble (generate) SINTRAN system directly from source tapes to mass storage, the DYNAMACM II Assembler must be used.

Two test programs exist in order to test the functions of the monitor and SINTRAN basic I/O respectively.

PROGRAM DESCRIPTION

Program Name : SINTRAN II Monitor

Description : The SINTRAN II Monitor is a real time multi-programming operating system for process control and other real time applications.

Documentation : SINTRAN II Users Guide
Generating SINTRAN II

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader

Software Requirements : SINTRAN II I/O System

Source Language : MAC

Other Comments : The SINTRAN II Monitor is delivered as three source tapes.

PROGRAM DESCRIPTION

Program Name : SINTRAN II I/O System

Description : Input/output routines for the real time programs in a SINTRAN II system.

Documentation : SINTRAN II Users Guide
Generating SINTRAN II

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader

Software Requirements : SINTRAN II monitor

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : SINTRAN II Operators Communications

Description : This program tape contains SINTRAN II Operators commands to communicate with the SINTRAN system. It also contains program giving error messages tor the SINTRAN system, and 8ROUT, an option to SINTRAN II I/O system.

Documentation : SINTRAN II Users Guide

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1

Peripheral Requirements : Teletype, paper tape reader

Software Requirements : SINTRAN II monitor and SINTRAN II I/O system

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : SINTRAN II IOLIB interface routines (I/O routine for accessing RT files.)

Description : Input/output interface routine to simulate an ordinary IOLIB in a SINTRAN II system. This IOLIB may handle RT files as devices.

Documentation : PD Catalog

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 300_8 + buffers

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader

Software Requirements : SINTRAN II system

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : SINTRAN II RT Loader

Description : Loader for loading real time programs in BRF format in a SINTRAN II mass storage system.

Documentation : SINTRAN II Real Time Loader

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1

Peripheral Requirements : Teletype, tape reader, mass storage

Software Requirements : SINTRAN II system

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : SINTRAN II All Core Loader

Description : Loader for loading real time programs in BRF format output from the RT FORTRAN II Compiler, the RT-FORTRAN IV Compiler and the MAC II assembler, in a SINTRAN II (code) system.

Documentation : BRL - Binary Relocating Loader

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 2400_8 + tables

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader

Software Requirements : SINTRAN II system

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : MACD

Description : MAC assembler without BRF, for assembling and debugging under a SINTRAN II system.

Documentation : MACD - MAC Debugging Assembler

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader

Software Requirements : SINTRAN II system

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : SINTRAN II Restart

Description : Routine to read the core resident part and coreload 0 of a binary SINTRAN II mass storage system from mass storage to core, and start the system in label START. (SINTRAN) Part two of this program writes the restart program to mass storage.

Documentation : SINTRAN II Users Guide
Generating SINTRAN II

Available Versions :

V1: SINTRAN II Restart for Vermont drum

V2: SINTRAN II Restart for CD disc

V3:

V4:

Program Size : Approx. 150_8

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader, mass storage

Software Requirements : SINTRAN II mass storage system

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : SINTRAN II Monitor test program

Description : Program to test the functions of the SINTRAN II monitor.

Documentation : Generating SINTRAN II

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 2K

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader

Software Requirements : SINTRAN II system

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : SINTRAN II I/O test program

Description : Program to test the functions of the SINTRAN II I/O system.

Documentation : Generating SINTRAN II

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 1200_8

CPU Requirements : NORD-1

Peripheral Requirements : Teletype, tape reader

Software Requirements : SINTRAN II system

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : COPY - SINTRAN II Version

Description : Routine for copying from one device to another in a SINTRAN II system. RT files are handled as devices by this routine.

Documentation : PD Catalog

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 500_8 + buffers

CPU Requirements : NORD-1

Peripheral Requirements : Teletype, tape reader

Software Requirements : SINTRAN II system

Source Language : MAC

Other Comments :

22 TSS - NORD TIMESHARING SYSTEM

This is a general timesharing system available for NORD-1 and NORD-10 configurations with at least 24K core memory and a disk.

Further information may be found in the documentation:

Brukerinstruks til NORD Timesharing System
Reference Manual for the NORD Timesharing System

TSS systems will be generated by ND.

Symbolic tapes are normally not available.

22.1 TSS Subsystems

Special TSS Subsystems

DESCRIBE	- System to describe commands in TSS.
MAIL	- Message sending system for TSS.
LIBRARY	- Library file system.
PRINT-FILE	- Listing program for TSS.
COPY	- General purpose copy program for TSS.

General Software as TSS Subsystems

These subsystem tapes are described in the corresponding chapters of the Software Catalog.

Examples of available subsystems are:

QED (editor), MAC (assembler), MACF, FORTRAN IV, BRL (loader), BASIC, KRYSSREF, CHESS, Bondesjakk etc.

PROGRAM DESCRIPTION

Program Name : MINIT

Description : The program is used to initialize NORD Timesharing System disk pack(s)

Documentation : Listing/NORD TSS Users Manual

Available Versions :

V1: MINIT NCR One Spindle

V2: MINIT Two Spindles

V3: MINIT CDC One Spindle Ch. 2

V4: MINIT CDC Two Spindles Ch. 2

V5: MINIT CDC One Spindle Ch. 1

V6: MINIT CDC Two Spindles Ch. 1

Program Size : About 3000_8

CPU Requirements : NORD-1

Peripheral Requirements:

Software Requirements :

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : CDC Bootstrap

Description : Bootstrap tape for restarting of TSS

Documentation :

Available Versions :

V1: CDC Bootstrap Version A Ch. 2

V2: CDC Bootstrap Version B Ch. 2

V3: CDC Bootstrap Version A Ch. 1

V4: CDC Bootstrap Version B Ch. 1

Program Size :

CPU Requirements : NORD-1

Peripheral Requirements: V1 and V2: CDC disk with dev. nos. 244-245
V3 and V4: CDC disk with dev. nos. 144-145

Software Requirements :

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : NCR Bootstrap

Description : Bootstrap tape for restarting of TSS

Documentation :

Available Versions :

V1: NCR Bootstrap Version A Sp. 0

V2: NCR Bootstrap Version B Sp. 0

V3: NCR Bootstrap Version A Sp. 1

V4: NCR Bootstrap Version B Sp. 1

Program Size :

CPU Requirements : NORD-1

Peripheral Requirements: V1 and V2: NCR disk with dev. nos. 44-45
V3 and V4: NCR disk with dev. nos. 144-145

Software Requirements :

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : TSS STIO for MAC

Description : Input/output interface routines against TSS (monitor calls). Input from file is buffered (open for random read). Tabs are expanded to spaces (8, 14, 30). The program is suitable for any system when changing the error routine.

Documentation : PD-sheet + listing

Available Versions :

V1:

V2:

V3:

V4:

Program Size : 605_8

CPU Requirements : NORD-1 or NORD-10

Peripheral Requirements:

Software Requirements : NORD TSS

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : Subsystem Tape 1 for TSS

Description : Contains: QED, DESCRIBE, LIBRARY, MAIL, COPY, PRINT FILE

Documentation : Reference Manual for the NORD Timesharing System

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-10

Peripheral Requirements:

Software Requirements : TSS

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name	:	Subsystem Tape 2 for TSS
Description	:	Contains: FTN4, FLDR, BASIC, MAC, KRYSSREF
Documentation	:	Reference Manual for the NORD Timesharing System
Available Versions	:	
V1:		For 24K core
V2:		For 32K (or greater) core
V3:		
V4:		
Program Size	:	
CPU Requirements	:	NORD-1 or NORD-10
Peripheral Requirements:		
Software Requirements	:	TSS
Source Language	:	MAC
Other Comments	:	

24 MISCELLANEOUS

Some demonstration programs are available.
(For example LUNAR Landing, and on request BONDESJAKK, LIFE and CHESS.)

PROGRAM DESCRIPTION

Program Name : Standard NORD-1 Interrupt System

Description : Contains level-head pointers, save and unsave programs and space for the level-heads.

Documentation : The Interrupt and Memory Protection System

Available Versions :

V1:

V2:

V3:

V4:

Program Size : 261_8 (absolute locations $20_8 \rightarrow 301_8$)

CPU Requirements : NORD-1

Peripheral Requirements : Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : LUNAR Landing

Description : Given attitude, speed and fuel left, you can try to land a space skip on the moon. Directions are given on the Teletypes.

Documentation : None (interactive program)

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype

Software Requirements : BASIC

Source Language : BASIC

Other Comments :

26 CORE ORIENTED REAL-TIME MONITORS

The following real-time monitors are available for core systems:

NORD-1 : SINTRAN, MINIMON, All Core Monitor, SYNK

NORD-20 : MINIMON

It is recommended to use the core version of SINTRAN Monitor if the computer configuration is to be expanded later with a mass memory (disc or drum) or a big core memory. The SINTRAN system is described in Chapter 3 in this manual. SINTRAN core version occupies about 2.5 - 3.5K of core.

MINIMON is a small monitor written for the NORD-20 computer. It don't use NORD-1 instructions not implemented on the NORD-20. MINIMON may also be used for the NORD-1 (conditional assembly of the source tape). MINIMON occupies less than 0.5K of core.

SYNC and All Core Monitor fall under class C software. Further information is given on request.

PROGRAM DESCRIPTION

Program Name : MINIMON

Description : Small real time monitor for core systems

Documentation : MINIMON Reference Manual

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 500_8

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, real time clock

Software Requirements : None

Source Language : MAC

Other Comments :

30 STANDARD I/O - I/O DRIVERS

NORD Software performs I/O via standard subroutine calls. Different versions of the subroutines and the I/O system behind (drivers etc.) exist. The main point is, however, that the calling sequence is standard. In that way software products as compilers, assemblers etc. may be used in different systems without modifications.

Main versions of standard I/O (STIO):

- STIO1 : Used by most freestanding software. This version contains IOT waiting loops and does not use the interrupt system.
- STIO2 : Used by MINIMON and freestanding IDT packages. (RJE simulators etc.) This version uses I/O buffers and interrupt drivers.
- SINTRAN II STIO: Interface routines to the SINTRAN II I/O system. (Which does not use the STIO standard. See Chapter 20.)
- TSS STIO : Used by TSS subsystems. Interface routines against TSS. (Consists mainly of "monitor calls" to TSS. See Chapter 22.)

I/O drivers are available for peripheral equipment. Those drivers may be used independently of ND's operating systems.

PROGRAM DESCRIPTION

Program Name : STIO1

Description : Standard Input/Output routines which do not use the interrupt system.

Documentation : Standard I/O

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : STIO2

Description : Standard Input/Output routines with buffers and interrupt drivers for peripheral devices.

Documentation : Standard I/O

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements : Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name	: Data Channel Device Drivers
Description	: Drivers for drum, disks, mag. tape, core/core, and plotter
Documentation	: PD-sheet + listing
Available Versions	:
V1:	
V2:	
V3:	
V4:	
Program Size	: Modular ($120-220_8$ per driver)
CPU Requirements	: NORD-1
Peripheral Requirements	:
Software Requirements	: The drivers have to be included in the users system
Source Language	: MAC
Other Comments	:

PROGRAM DESCRIPTION

Program Name : CUTR 37 - Catsy Utility Routines

Description : I/O Drivers for the Cassette Tape System Catsy 100

Documentation : Cassette Tape System - CATSY Programming Manual

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, CATSY 100

Software Requirements : None

Source Language : MAC

Other Comments :

35 I/O FORMATTING ROUTINES

The FORTRAN IV I/O system is available in BRF format.

Formatting subroutines (MAC subroutines) for floating point input-output (IRT-ORT), octal or decimal integer input-output etc. are available in symbolic format. The subroutines make use of INBT-OUTBT (Standard I/O).

Further information is available on request.

PROGRAM DESCRIPTION

Program Name : I/O Formatting Routine Package

Description : Formatting subroutines for floating point input/output, octal or decimal input/output etc.

Documentation : Input/Output Formatting Routines

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader

Software Requirements : An IOLIB version (standard I/O)
If NORD-20: N1SIM

Source Language : MAC

Other Comments :

40 MATHEMATICAL LIBRARY ROUTINES

The following routine is available:

- The Re-entrant FORTRAN Mathematical Library is available as BRF tape. It contains the subroutines SIN, COS, SQRT, ATAN, SINH, EXP, etc.

  Documentation: Re-entrant FORTRAN Mathematical Library

See also Scientific Subroutines.

Further information is available on request.

PROGRAM DESCRIPTION

Program Name : Double Precision Arithmetic Routines

Description : Subroutines for double precision floating point; add, subtract, multiply and divide.

Documentation : PD-catalog

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : Re-entrant Library

Description : FORTRAN Mathematical Library for FORTRAN IV

Documentation : Re-entrant FORTRAN Mathematical Library

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements : Teletype, tape reader

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments :

42 SCIENTIFIC SUBROUTINES

42.1 General Remarks

Below are listed the subroutines of SSP grouped into related functional areas. In the case of six statistical entries (Multiple Linear Regression to Factor Analysis) the abstract gives the sequence of several SSP subroutines needed to perform the statistical function.

42.2 Statistics

42.2.1 Data Screening

ABSNT	- detection of missing data
BOUND	- selection of observations within bounds
DASCR*	- data screening calculations on a set of observations
SUBMX	- build subset matrix
SUBST	- subset selection from observation matrix
TAB1	- tabulation of data (1 variable)
TAB2	- tabulation of data (2 variables)
TALLY	- totals, means, standard deviations, minimums, and maximums

42.2.2 Elementary Statistics

FNORM	- fractiles in the normal distribution
MOMEN	- first four moments
TTEST	- tests on population means

42.2.3 Correlation

CORRE	- means, standard deviations, and correlations

42.2.4 Multiple Linear Regression

Abstract (CORRE, ORDER, MINV, MULTR in sequence)

MULTR	- multiple regression and correlation
ORDER	- rearrangement of intercorrelations

---

* main program

42.2.5 Polynomial Regression

Abstract (GDATA, ORDER, MINV, MULTR in sequence)

GDATA - data generation

42.2.6 Canonical Correlation

Abstract (CORRE, CANOR, MINV, NROOT, EIGEN in sequence)

CANOR - canonical correlation

NROOT - eigenvalues and eigenvectors of a special nonsymmetric matrix

42.2.7 Analysis of Variance

Abstract (AVDAT, AVCAL, MEANQ in sequence)

AVCAL - Σ and Δ operations

AVDAT - data storage allocation

MEANQ - mean square operation

42.2.8 Discriminant Analysis

Abstract (DMATX, MINV, DISCR in sequence)

DISCR - discriminant functions

DMATX - means and dispersion matrix

42.2.9 Factor Analysis

Abstract (CORRE, EIGEN, TRACE, LOAD, VARMX in sequence)

LOAD - factor loading

TRACE - cumulative percentage of eigenvalues

VARMX - varimax rotation

42.2.10 Time Series

AUTO - autocovariances

CROSS - crosscovariances

EXPON* - time series smoothing

EXSMO - triple exponential smoothing

SMO - application of filter coefficients (weights)

---

* main program

42.2.11 Nonparametric Statistics

CHISQ	- x^2 test for a contingency table
KRANK	- Kendall rank correlation
QTEST	- Cochran Q-test
RANK	- rank observations
SRANK	- Spearman rank correlation
TIE	- calculation of ties in ranked observations
TWOAV	- Friedman two-way analysis of variances
UTEST	- Mann-Whitney U-test
WTEST	- Kendall coefficient of concordance

42.2.12 Random Number Generators

GAUSS	- normal random numbers

42.3 Matrix Manipulation

42.3.1 Special Matrix Operations

EIGEN	- eigenvalues and eigenvectors of a real, symmetric matrix
MATIN*	- input of a matrix
MFGR	- matrix factorisation and rank determination
MINV	- matrix inversion
MXOUT*	- output of a matrix

42.3.2 Matrices

ADSAM**	- matrix addition
GMADD	- sum of two general matrices
GMPRD	- product of two general matrices
GMSUB	- difference of two general matrices
GMTRA	- transpose of a general matrix
GTPRD	- transpose product of two general matrices
MADD	- sum of two matrices

---

* This subroutine is not free from input/output statements.

** Main program

MPRD	- product of two matrices
MSUB	- difference of two matrices
MTRA	- transpose of a matrix
MATA	- transpose product of matrix by itself
TPRD	- transpose product of two matrices
SADD	- add scalar to matrix
SCLA	- matrix clear and add scalar
SDIV	- matrix divided by a scalar
SMPY	- matrix multiplied by a scalar
SSUB	- subtract a scalar from a matrix
RADD	- add row of one matrix to row of another matrix
CADD	- add column of one matrix to column of another matrix
SRMA	- scalar multiply row and add to another row
SCMA	- scalar multiply column and add to another column
RINT	- interchange two rows
CINT	- interchange two columns
RSUM	- sum the rows of a matrix
CSUM	- sum the columns of a matrix
RTAB	- tabulate the rows of a matrix
CTAB	- tabulate the columns of a matrix
RSRT	- sort matrix rows
CSRT	- sort matrix columns
RCUT	- partition row-wise
CCUT	- partition column-wise
RTIE	- adjoin two matrices row-wise
CTIE	- adjoin two matrices column-wise
MCPY	- matrix copy
XCPY	- copy submatrix from given matrix
RCPY	- copy row of matrix into vector
CCPY	- copy column of matrix into vector
DCPY	- copy diagonal of matrix into vector
DCLA	- replace diagonal with scalar
MFUN	- matrix transformation by a function
ARRAY	- vector storage - double dimensioned storage conversion

LOC	- location in compressed-stored matrix
MSTR	- storage conversion

42.4 Other Mathematical Areas

42.4.1 Fourier Analysis

FORIF	- Fourier analysis of a given function
FORIT	- Fourier analysis of a tabulated function
RHARM	- Fourier coefficients

42.4.2 Simultaneous Equations

GELB	- solution of a system of simultaneous linear equations
GELG	- solution of a general system of simultaneous linear equations
GELS	- solution of a system of simultaneous linear equations with symmetric coefficient matrix
SIMQ	- solution of simultaneous linear, algebraic equations
SOLN*	- solve a set of simultaneous linear equations

42.4.3 Sorting

INTST	- basic sorting routine

42.4.4 Interpolation

AHI	- interpolation by using a table of argument, function and derivative values
ALI	- interpolation by using a table of argument and function values

42.4.5 Differential Equations

HPCG	- 1. order general initial value problem
HPCL	- 1. order initial value problem
LBVP	- linear boundary value problem
RKGS	- 1. order initial value problem

---

* Main program

RK1	- integral of first-order differential equation by Runge-Kutta method
RK2	- tabulated integral of first-order differential equation by Runge-Kutta method
RK3	- integration of six first-order differential equations

42.4.6 Selection and Ordering Points

ATSE	- points of a given table with equidistant arguments are selected and ordered
ATSG	- points of a given general table are selected
ATSM	- points of a given table with monotonic arguments are selected and ordered

42.4.7 Special Operations and Mathematical Functions

BESI	- I Bessel function
BESJ	- J Bessel function
BESK	- K Bessel function
BESY	- Y Bessel function
CELI1	- elliptic integral of 1. kind
CELI2	- elliptic integral of 2. kind
CS	- Fresnel integrals
ELI1	- elliptic integral of 1. kind
ELI2	- elliptic integral of 2. kind
EXPI	- exponential integral
FMCG	- local minimum of a function of several variables
HAVIE	- integral of a given function between two limits
JELF	- Jacobian elliptic function
LLSQ	- linear least square problems
RANGE	- maximum and minimum element in a given part of a real array
TEUL	- sum of FCT(K), K=1,...,∞

42.4.8 Polynomial Operations

PADD	- add two polynomials
PADDM	- multiply polynomial by a constant and add to another polynomial
PCLA	- replace one polynomial by another
PCLD	- complete linear synthetic division
PDER	- derivative of a polynomial
PDIV	- divide one polynomial by another
PECN	- economise a polynomial of a symmetric range
PECS	- economise a polynomial for unsymmetric range
PGCD	- greatest common diviser of two polynomials
PILD	- evaluate polynomial and 1. derivation
PINT	- integral of a polonymial
PMPY	- multiply two polynomials
PNORM	- normalise coefficient
PQSD	- vector of a polynomial quadric synthetic division
PSUB	- subtract one polynomial from another
PVAL	- value of a polynomial
PVSUB	- substitute variable of a polynomial by another polynomial

42.4.9 Roots of Nonlinear Equations

RTMI	- determine root within a range by Muller's iteration
RTMIT	- determine root
RTNI	- refine estimate of root by Newton's iteration
RTNIT	
RTWI	- refine estimate of root by Wegstein's iteration
RTWIT	

42.4.10 Special Polynomials

CNP	- value of Chebyshev polynomials
CNPS	- value of expansion in Chebyshev polynomials
CSP	- value of shifted Chebyshev polynomials
CSPS	- value of expansion in shifted Chebyshev polynomials
HEP	- value of Hermite polynomials
HEPS	- value of expansion in Hermite polynomials
LAP	- value of Laguerre polynomials
LAPS	- value of expansion in Laguerre polynomials
LEGEN	- value of Legendre polynomials
LEP	- value of Legendre polynomials
LEPS	- value of expansion in Legendre polynomials
TCNP	- transformation of a series expansion in Chebyshev polynomials
TCSP	- transformation of a series expansion in shifted Chebyshev polynomials
THEP	- transformation of a series expansion in Hermite polynomials
TLAP	- transformation of a series expansion in Laguerre polynomials
TLEP	- transformation of a series expansion in Legendre polynomials

42.4.11 Integration

QA2 QA3 QA4 QA5 QA6 QA7 QA8 QA9 QA10	- integrate EXP(-X)* FCT(X)/SQRT(X), using 2 to 10 points
QATR	- approximate integral of FCT(X)
QG2 QG3 QG4 QG5 QG6 QG7 QG8 QG9 QG10	- integrate FCT(X), using 2 to 10 points

QH2 QH3 QH4 QH5 QH6 QH7 QH8 QH9 QH10	- integrate EXP(-X*X)*FCT(X) from -infinity to +infinity, using 2 to 10 points
QHFE	- integral values for a given equidistant table of function and derivative values
QHFG	- integral values for a given general table of argument, function and derivative values
QHSE	- integral values for a given equidistant table of function, 1. and 2. derivative values
QHSG	- integral values for a given general table of argument, function, 1. and 2. derivative values
QL2 QL3 QL4 QL5 QL6 QL7 QL8 QL9 QL10	- integrate EXP(-X)*FCT(X) from 0 to infinity, using 2 to 10 points
QSF	- integral values for a given equidistant table of function values
QTFE	- integral values for a given equidistant table of function values
QTFG	- integral values for a given general table of argument and function values
QUADR	- integral a given tabulated function
SMPSN	- integrate a given function of the prescribed range

42.5 Tape Delivery for SSP

A standard delivery of SSP consists of four headprograms in BRF-format and four library tapes in BRF library format.

The symbolic tapes are available on request. (At a cost covering the copy expences etc. - about kr 100 - 200 each.)

42.6 SSP - Library Tapes

Headprograms	Contents
Tape 1	DASCR
Tape 2	EXPON
Tape 3	ADSAM
Tape 4	SOLN

Library Tape	Contents
Tape I	CANOR, KRANK, SRANK, TWOAV, UTEST, WTEST, RANK, WROOT, AUTO, AVCAL, AVDAT, BOUND, CHISQ, CROSS, DMATX, EXSMO, FNORM, GDATA, SMO, QTEST, LOAD, SUBMX, SUBST, TAB1, TAB2, TALLY, TIE, TRACE, TTEST, VARMX, CORRE, ABSNT, MOMEN, MULTR, ORDER, MEANQ, GAUSS.
Tape II	CSRT, COPY, CTAB, RTAB, MTRA, ARRAY, CCUT, CINT, CSUM, CTIE, DCLA, DCPY, GMADD, GMPRD, GMSUB, GMTRA, RADD, RCPY, RCUT, RINT, RSRT, RSUM, RTIE, SADD, SCLA, SCMA, SDIV, SMPY, SRMA, SSUB, TPRD, XCPY, MSUB, MPRD, MADD, MATIN, CADD, MCPY, MFGR, MATA, MINV, MXOUT, EIGEN, LOG, MFUN, MSTR
Tape III	PADDM, PGCD, PDIV, PILD, PVSUB, AHI, ALI, ATSE, ATSG, ATSM, BESI, BESJ, BESK, CELI2, CNP, CNPS, CS, CSP, CSPS, ELI1, ELI2, EXPI, FMCG, FORIF, FORIT, GELB, GELG, GELS, HAVIE, HEP, HEPS, HPCG, HPCL, INTST, JELF, LAP, LAPS, LEGEN,

LEP, LEPS, LLSQ, PVAL, QA2, QA3, QA4, QA5, QA6, QA7, QA8, QA9, QA10, QA TR, QG2, QG3, QG4, QG5, QG6, QG7, QG8, QG9, QG10, QH2, QH3, QH4.

Tape IV

QH5, QH6, QH7, QH9, QH10, QHFE, QHFG, QHSE, QHSG, QL2, QL3, QL4, QL5, QL6, QL7, QL8, QL9, QL10, QSF, QTFE, QTFG, QUADR, RANGE, RHARM, RK1, RK2, RK3, RKGS, RTMIT, RTNI, RTWI, RTWIT, SIMQ, SMPSN, TCNP, TCSP, TEUL, THEP, TLAP, TLEP, BESY, RADD, PCLA, PCLD, PDER, PECS, PINT, PMPY, PNORM, PQSD, PSUB, CELI1, RTMI, RTNIT, DISCR

42.7 SSP - Symbolic Tapes

PD-496	ABSNT	PD-531	DASCR
PD-497	ADSAM	PD-532	DCLA
PD-498	AHI	PD-533	DCPY
PD-499	ALI	PD-534	DISCR
PD-500	ARRAY	PD-535	DMATX
PD-501	ATSE	PD-536	EIGEN
PD-502	ATSG	PD-537	ELI 1
PD-503	ATSM	PD-538	ELI 2
PD-504	AUTO	PD-539	EXPI
PD-505	AVCAL	PD-540	EXPON
PD-506	AVDAT	PD-541	EXSMO
PD-507	BESI	PD-542	FMCG
PD-508	BESJ	PD-543	FNORM
PD-509	BESK	PD-544	FORIF
PD-510	BESY	PD-545	FORIT
PD-511	BOUND	PD-546	GAUSS
PD-512	CADD	PD-547	GDATA
PD-513	CANOR	PD-548	GELB
PD-514	CCPY	PD-549	GELG
PD-515	CCUT	PF-550	GELS
PD-516	CELI1	PD-551	GMADD
PD-517	CELI2	PD-552	GMPRD
PD-518	CHISQ	PD-553	GMSUB
PD-519	CINT	PD-554	GMTRA
PD-520	CNP	PD-731	GTPRD
PD-521	CNPS	PD-555	HAVIE
PD-522	CORRE	PD-556	HEP
PD-523	CROSS	PD-557	HEPS
PD-524	CS	PD-558	HPCG
PD-525	CSP	PD-559	HPCL
PD-526	CSPS	PD-560	INTST
PD-527	CSRT	PD-561	JELF
PD-528	CSUM	PD-562	KRANK
PD-529	CTAB	PD-563	LAP
PD-530	CTIE	PD-564	LAPS

PD-565	LBVP	PD-601	PNORM
PD-566	LEGEN	PD-602	PQSD
PD-567	LEP	PD-603	PSUB
PD-568	LEPS	PD-604	PVAL
PD-569	LLSQ	PD-605	PVSUB
PD-570	LOAD	PD-606	QA2
PD-571	LOC	PD-607	QA3
PD-572	MADD	PD-608	QA4
PD-573	MATA	PD-609	QA5
PD-574	MATIN	PD-610	QA6
PD-575	MCPY	PD-611	QA7
PD-576	MEANQ	PD-612	QA8
PD-577	MFGR	PD-613	QA9
PD-578	MFUN	PD-614	QA10
PD-579	MINV	PD-615	QATR
PD-580	MOMEN	PD-616	QG2
PD-581	MPRD	PD-617	QG3
PD-582	MSTR	PD-618	QG4
PD-583	MSUB	PD-619	QG5
PD-584	MTRA	PD-620	QG6
PD-585	MULTR	PD-621	QG7
PD-586	MXOUT	PD-622	QG8
PD-587	NROOT	PD-623	QG9
PD-588	ORDER	PD-624	QG10
PD-589	PADD	PD-625	QH2
PD-590	PADDM	PD-626	QH3
PD-591	PCLA	PD-627	QH4
PD-592	PCLD	PD-628	QH5
PD-593	PDER	PD-629	QH6
PD-594	PDIV	PD-630	QH7
PD-595	PECN	PD-631	QH8
PD-596	PECS	PD-632	QH9
PD-597	PGCD	PD-633	QH10
PD-598	PILD	PD-634	QHFE
PD-599	PINT	PD-635	QHFG
PD-600	PMPY	PD-636	QHSE

PD-637	QHSG
PD-638	QL2
PD-639	QL3
PD-640	QL4
PD-641	QL5
PD-642	QL6
PD-643	QL7
PD-644	QL8
PD-645	QL9
PD-646	QL10
PD-647	QSF
PD-648	QTEST
PD-649	QTFE
PD-650	QTFG
PD-651	QUADR
PD-652	RADD
PD-653	RANGE
PD-654	RANK
PD-655	RCPY
PD-656	RCUT
PD-659	RHARM
PD-660	RINT
PD-661	RK1
PD-662	RK2
PD-663	RK3
PD-664	RKGS
PD-665	RSRT
PD-666	RSUM
PD-667	RTAB
PD-668	RTIE
PD-669	RTMI
PD-670	RTMIT
PD-671	RTNI
PD-672	RTNIT
PD-673	RTWI
PD-674	RTWIT
PD-675	SADD
PD-676	SCLA
PD-677	SCMA
PD-678	SDIV
PD-679	SIMQ
PD-680	SMO
PD-681	SMPSN
PD-682	SMPY
PD-683	SOLN
PD-684	SRANK
PD-685	SRMA
PD-686	SSUB
PD-687	SUBMX
PD-688	SUBST
PD-689	TAB1
PD-690	TAB2
PD-691	TALLY
PD-692	TCNP
PD-693	TCSP
PD-694	TEUL
PD-695	THEP
PD-696	TIE
PD-697	TLAP
PD-698	TLEP
PD-699	TPRD
PD-700	TRACE
PD-701	TTEST
PD-702	TWOAV
PD-703	UTEST
PD-704	VARMX
PD-705	WTEST
PD-706	XCPY

44 COMMERCIAL SUBROUTINES

The Commercial Subroutine Package is a subset of the corresponding IBM program package. The subroutines are written in NORD-1 assembler language. They may be used together with FORTRAN programs as a replacement for COBOL.

Documentation: NORD Commercial Subroutine Package.

Further information is available on request.

PROGRAM DESCRIPTION

Program Name : NORD Commercial Subroutine Package

Description : This program package is a subset of the corresponding IBM Commercial Subroutine Package. They may be used together with FORTRAN programs as a replacement for COBOL.

Documentation : NORD Commercial Subroutine Package

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader

Software Requirements : If NORD-20: N1SIM

Source Language : MAC

Other Comments :

46 NORD PLOT PACKAGE

The Plot Package is a software package for the CALCOMP drum type incremental plotters. It contains assembly coded and FORTRAN coded routines for line and point drawing (PLOT), initialization (PLOTS), return current position information (WHERE), to magnify or reduce the coordinate values (FACT), to plot ASCII characters or special symbols (SYMBL), to plot numbers (NUMBR), to make a coordinate set depending on the span of the data in an array (SCALE), to draw scaled axes (AXIS), to draw curves from data set (LINE), to draw a circle (CIRCL) and to draw a rectangle (RECT) and a gitter system (GRID).

All routines may be called from FORTRAN, MAC and BASIC. The package is also simulated to be used in connection with NORDCOM and TEKTRONIX 4010 display.

PROGRAM DESCRIPTION

Program Name : NORD Plot Package

Description : The NORD Plot Package consists of 12 subroutines which make it easier to operate an x-y plotter. The subroutines draw stright lines, characters, floating point numbers, axis, rectangles, circles and so on.

Documentation : NORD Plot Package

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Modular

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, x-y plotter

Software Requirements : If NORD-20: N1SIM

Source Language : MAC and FORTRAN IV

Other Comments :

50 SPECIAL SOFTWARE FOR NORD-20 AND NORD-2B

All of the NORD-1 software described in this catalogue which do not use the NORD-1 in terrupt system can be run on NORD-20 without any modifications.

The special software 2BCOM and SIMUL makes this possible. 2BCOM is a program for communication with the computer via Teletype. SIMUL simulates the missing NORD-1 instructions. 2BCOM and SIMUL (1 and 2) are delivered on a NORD-20 binary tape called N1SIM. This is the key-tape for NORD-20 users.

Device numbers for Teletype and tape reader on NORD-20 are equal to the standard used on NORD-1. (TTY1 = 2 and 3, reader = 22). Device numbers for the other devices are not standardized. One may therefore have to use the "device number convertion" feature of 2BCOM to run NORD-1 binary tapes which use line printer, card reader, etc.

PROGRAM DESCRIPTION

Program Name : N1SIM

Description : Communication and debugging program for the NORD-20. Routines for simulation of the NORD-1 on the NORD-20. (NORD-1 interrupt system is not included.)

Documentation : Special Software for NORD-20.

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 2500_8

CPU Requirements : NORD-20

Peripheral Requirements : Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : 2BCOM/INTH

Description : Communication and debugging package for the NORD-20 computer. Interrupt handler for the NORD-20.

Documentation : Special Software for NORD-20

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 600_8

CPU Requirements : NORD-20

Peripheral Requirements: Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : SIMUL 1

Description : Simulates the following NORD-1 instructions on NORD-20:
LDD, STD, STF, LDF, SWAP, REXO, MPY, BOP, SHIFT, TRR, IOT

Documentation : Special Software for NORD-20

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 1100_8

CPU Requirements : NORD-20

Peripheral Requirements : Teletype, tape reader

Software Requirements : 2BCOM and INTH

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : SIMUL 2

Description : Simulates the following NORD-1 instructions on NORD-20.
FAD, FSB, FMU, FDV, NLZ, DN2.

Documentation : Special Software for NORD-20

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 500_8

CPU Requirements : NORD-20

Peripheral Requirements : Teletype, tape reader

Software Requirements : INTH, SIMUL 1

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : SIMUL 3

Description : Simulates the NORD-1 interrupt system on NORD-20.

Documentation : Special Software for NORD-20

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 200_8

CPU Requirements : NORD-20

Peripheral Requirements : Teletype, tape reader

Software Requirements : SIMUL 1, INTH

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : MOBO

Description : MOBO is an option to 2BCOM. MOBO makes it possible to set breakpoints in monitor mode on NORD-20.

Documentation : Special Software for NORD-20

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 150_8

CPU Requirements : NORD-20

Peripheral Requirements : Teletype, tape reader

Software Requirements : 2BCOM (N1SIM)

Source Language : MAC

Other Comments : MOBO version, V1 and V2 are on the same tape.

PROGRAM DESCRIPTION

Program Name : 2BPUN

Description : This program may be used to dump a standard NORD-20 or NORD-1 binary tape.

Documentation : Special Software for NORD-20

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 250_8

CPU Requirements : NORD-20 or NORD-1

Peripheral Requirements: Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments : 2BPUN versions V1 and V2 are on the same tape.

55 ALARMSCAN - PROCESS CONTROL PACKAGES

Class A: MESYS and the corresponding utility program (data generator) MGEN.

Class B: The analog package MEAS with data generator. The DDC package PIDC will be available in the near future.

PROGRAM DESCRIPTION

Program Name : MESYS

Description : Software package for data logging and alarm scanning

Documentation : MESYS and MGEN Reference Manual

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 600_8

CPU Requirements : NORD-20 or NORD-1

Peripheral Requirements: Teletype, Tape reader, Multiplexer, A/D converter

Software Requirements : MINIMON

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : MGEN

Description : Data generator (table builder) for MESYS

Documentation : MESYS and MGEN Reference Manual

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 2.5K

CPU Requirements : NORD-20 or NORD-1

Peripheral Requirements: Teletype, tape reader

Software Requirements : Standard I/O

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : MESUB

Description : Subroutines for communication of data to or from the measure value descriptions of MESYS.

Documentation : Ref. comments on program listing

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements:

Software Requirements : MESYS

Source Language :

Other Comments : For the moment MESUB is a type C product as it is not yet thoroughly tested.

60 REMOTE JOB ENTRY DATA TRANSMISSION

The following general software products are available:

- A DCT-2000 simulator (UNIVAC)
- An IBM 2780 simulator
- A CDC 200 User simulator
- GERTS-115 (Honeywell Bull RJE simulator)

The program tapes cannot be ordered directly. Please contact ND for further information about this software.

65 OTHER APPLICATION ORIENTED SOFTWARE

A system for land surveying is available. It runs on a NORD-1 or NORD-20 computer with 8K of core. It is also available as a TSS subsystem.

90 HARDWARE TEST PROGRAMS

The test programs are divided into three groups:

Test program for: NORD-1
NORD-20
NORD-10

NB! Note that some of the program tapes may be common for several groups. In that case the program description sheet is found in one of the groups only.

In the program reference list, however, all cross references between the chapters are listed. In this list you will therefore find the complete set of test programs for each computer type.

90.1 Test Programs for NORD-1

The following programs can be run on NORD-1, but are found in the NORD-20 group:

PERMI (page 90-26)
TLINE (page 90-31)

PROGRAM DESCRIPTION

Program Name : Memory test

Description : Test program for memory
Contains Memory Check Otto and Memory
Check 20 upper and lower versions.

Documentation : Memory Check Otto
Memory Check for NORD-20

Available Versions :

V1: Memory test lower, loaded from paper tape reader

V2: Memory test lower, loaded from Teletype (NORD-20 only!)

V3: Memory test upper, loaded from paper tape reader

V4:

Program Size : Somewhat less than 4K

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

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PROGRAM DESCRIPTION

Program Name : Instruction Check Program No. 1

Description : This program tests all the instructions in the NORD-1, except the IDT, MIS, FAD, FSB, FMU and FDV instructions.

Documentation : Test Programs

Available Versions :

V1: Octal

V2: Binary

V3:

V4:

Program Size : Approx. 500_8

CPU Requirements : NORD-1

Peripheral Requirements: Tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : Instruction Check Program No. 2

Description : This program tests the instructions which operate on the STS, MPR and PID registers. The program also tests the NLZ, DNZ FMU and FDV instructions.

Documentation : Test Programs

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 500_8

CPU Requirements : NORD-1

Peripheral Requirements: Tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : Instruction Check Program No. 3

Description : Tests the NORD-1 Interrupt System

Documentation : Test Programs

Available Versions :

V1:

V2:

V3:

V4:

Program Size : 320_8

CPU Requirements : NORD-1

Peripheral Requirements: Tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : Floating Debugger & Data

Description : Tests the DNX, NLZ, FDV, FMU, FAD and FSB instructions.

Documentation : Floating Point Debugger

Available Versions :

V1:

V2:

V3:

V4:

Program Size : 1413_8

CPU Requirements : NORD-1

Peripheral Requirements : Tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : Memory Protection Test Program

Description : This program tests the memory protection system in NORD-1. The memory size to be tested is given as a parameter when the program is assembled.

Documentation : Test Programs

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 500_8

CPU Requirements : NORD-1

Peripheral Requirements : Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : RTCLK

Description : Tests real time clock on NORD-1

Documentation : PD-catalogue

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 420_8

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader, real time clock

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : TESTT

Description : Test program for Teletype

Documentation : Self-documenting (interactive)

Available Versions :

V1: To be loaded from the paper tape reader
V2: To be loaded from the Teletype (NORD-20 only!)
V3:
V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : Test REA and PFA

Description : Test paper tape reader and paper tape punch

Documentation : Self-documenting (interactive)

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 500_8

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements : Teletype, tape reader, tape punch

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : TCARD

Description : Test program for card reader

Documentation : Self-documenting (interactive)

Available Versions :

V1: To be loaded from the tape reader

V2: To be loaded from the Teletype (NORD-20 only!)

V3:

V4:

Program Size : Approx. 1300_8

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, card reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : I/O Interrupt Test and Card Reader Test

Description : Tests the I/O interrupt system. If card reader, the program checks the presence of the end of card signal

Documentation : Self-documenting (interactive)

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 1500_8

CPU Requirements : NORD-1

Peripheral Requirements : Teletype, tape reader (tape punch, card reader)

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : LPT 1.0 Line Printer Test Program

Description : Test for the Data Products 2410 Line Printer

Documentation :

Available Versions :

V1: To be loaded from the tape reader

V2: To be loaded from the Teletype (NORD-20 only!)

V3:

V4:

Program Size : Approx. 700_8

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, Data Products 2410, Line printer

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : IOFRQ

Description : Test I/O frequency by checking the interval between IOT-instructions

Documentation :

Available Versions :

V1: To be loaded from the tape reader

V2: To be loaded from the Teletype (NORD-20 only!)

V3:

V4:

Program Size : Less than 4K (+ table in the rest of core)

CPU Requirements : NORD-1, NORD-20

Peripheral Requirements : Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : TECOD

Description : Testprogram for core and disc

Documentation : TECOD Users Guide

Available Versions :

V1: TECOD for CDC disc channel 1
V2: TECOD for CDC disc channel 2
V3: TECOD for NCR disc
V4:

Program Size :

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader, CDC/NCR disc

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : MINIT

Description : Program for mass storage initiation

Documentation : Self-documenting (interactive)

Available Versions :

V1: MINIT/NCR, one spindle
V2: MINIT/NCR, two spindles
V3: MINIT/CDC, one spindle, ch. 1
V4: MINIT/CDC, two spindles, ch. 1
V5: MINIT/CDC, one spindle, ch. 2
V6: MINIT/CDC, two spindles, ch. 2

Program Size :

CPU Requirements : NORD-1

Peripheral Requirements : Teletype, tape reader, NCR/CDC disc

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : CDC Formatting

Description : Program for formatting CDC disk (fixed and removable disk packs)

Documentation : PD-catalogue

Available Versions :

V1: NORD-1

V2:

V3:

V4:

Program Size : Approx. 400_8

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader, CDC disk

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : DIMS

Description : Disc maintenance system
(copy, compare, verify, change, dump)

Documentation : Disc Maintenance System (Preliminary User's Guide)

Available Versions :

V1: DIMS for NCR disc channel 0
V2: DIMS for CDC disc channel 1
V3: DIMS for CDC disc channel 2
V4:

Program Size : Approx. 2400_8

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader, NCR/CDC disc

Software Requirements : None

Source Language : MAC

Other Comments :

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PROGRAM DESCRIPTION

Program Name : Magtape (HP 7970) Test Program

Description : Tests the HP 7970 Magtape according to specification of January 1972

Documentation : PD-catalogue

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 2K

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader, HP 7970 magtape unit

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : MTTK - Magtape test for Kennedy Magtape

Description : Consists of one write test and one read test and a test of file mark.

Documentation : Magtape test for Kennedy Incremental Taperecorder

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 400_8

CPU Requirements : NORD-1

Peripheral Requirements: Tape reader, Kennedy Incremental Taperecorder

Software Requirements : None

Source Language : MAC

Other Comments :

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PROGRAM DESCRIPTION

Program Name : CVER40

Description : Hardware test program for the Catsy-100 Cassette Tape System

Documentation : Cassette Tape System - System Verification Program

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 3K

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, Catsy-100

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : DRUMV B (8)

Description : Drum verification program. The program tests most of the drum functions.

Documentation : Test program for Rotating Fixed Head Mass Memory Report 70-40-C (SINTEF)

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Approx. 1.5K

CPU Requirements : NORD-1

Peripheral Requirements : Teletype, tape reader, Verment drum

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : DRUM - OV

Description : Overlay for Drum verification program

Documentation : Test program for Rotating Fixed Head Mass Memory Report 70-40-C (SINTEF)

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader, Verment drum

Software Requirements : DRUMV - Drum verification program

Source Language : MAC

Other Comments :

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PROGRAM DESCRIPTION

Program Name : DRUM - MS

Description : Drum maintenance test program

Documentation : Test Program for Rotating Fixed Head Mass Memory Report 70-40-C (SINTEF)

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-1

Peripheral Requirements: Teletype, tape reader, Verment drum

Software Requirements : None

Source Language : MAC

Other Comments :

90.2 Test Programs for NORD-20

The following programs can be run on NORD-20, but are found in the NORD-1 group:

PROGRAM DESCRIPTION

Program Name : PERMI Instruction Check No. 1 for NORD-20

Description : Tests the basic NORD-20 instructions. May also be run on NORD-1

Documentation : Users Manual for Instruction Check Program PERMI

Available Versions :

V1: To be loaded from paper tape reader

V2: To be loaded from Teletype

V3:

V4:

Program Size : Approx. 4K

CPU Requirements : NORD-20 or NORD-1

Peripheral Requirements: Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : Instruction Check No. 2 for NORD-20

Description : This program tests program interrupt, inter register block transfer etc. for NORD-20. This program can be used if PERMI works.

Documentation : Instruction Check II NORD-20

Available Versions :

V1: To be loaded from paper tape reader

V2: To be loaded from Teletype

V3:

V4:

Program Size : Approx. 2300_8

CPU Requirements : NORD-20

Peripheral Requirements: Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : TIN20

Description : Test program for the interrupt system on NORD-20.

Documentation : Self-documenting (interactive)

Available Versions :

V1: TIN20 loaded from paper tape reader
V2: TIN20 loaded from Teletype
V3:
V4:

Program Size : Somewhat less than 4K

CPU Requirements : NORD-20

Peripheral Requirements: Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : RCLK2

Description : Tests real time clock on NORD-20

Documentation : PD-catalogue

Available Versions :

V1: To be loaded from the tape reader

V2: To be loaded from the Teletype

V3:

V4:

Program Size : 352_8

CPU Requirements : NORD-20

Peripheral Requirements: Teletype, tape reader, real time clock

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : PFAIL

Description : Tests power fail interrupt on NORD-20

Documentation : PD-catalogue

Available Versions :

V1:

V2:

V3:

V4:

Program Size : 730_8

CPU Requirements : NORD-20

Peripheral Requirements: Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : TLINE

Description : Test program for syncronous data transmissions between two NORD computers

Documentation : Self documenting (interactive)

Available Versions :

V1: To be loaded from the paper tape reader (also NORD-1)

V2: To be loaded from the Teletype

V3:

V4:

Program Size :

CPU Requirements : NORD-1 or NORD-20

Peripheral Requirements: Teletype, tape reader, syncronous modem interface, modem

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : CLK2B

Description : Checks the real time clock on NORD-2B

Documentation : None

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : NORD-2B

Peripheral Requirements: Teletype, tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

90.3 Test Programs for NORD-10

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PROGRAM DESCRIPTION

Program Name : Memory Test N-10

Description : Memory Test Program

Documentation : User's Guide

Available Versions :

V1: Binary 20 ₹

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : NORD-10

Peripheral Requirements: Teletype (load device)

Software Requirements : None

Source Language : MAC

Other Comments :

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PROGRAM DESCRIPTION

Program Name : ONE-CHECK N-10

Description : Instruction verification program. Verifies the basic N-10 part og the N-10 instruction set

Documentation : NORD-10 Verifications Programs

Available Versions :

V1: Binary 20 <

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : N-10 (operators panel)

Peripheral Requirements: Load device

Software Requirements : None

Source Language : MAC

Other Comments :

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PROGRAM DESCRIPTION

Program Name : TWO-CHECK N-10

Description : Instruction verification program. Verifies special N-10 instructions

Documentation : NORD-10 Verification Programs

Available Versions :

V1: Binary 20 <

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : N-10 (operators panel)

Peripheral Requirements: Load device

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : THREE-CHECK N-10

Description : Programmed interrupt verification

Documentation : NORD-10 Verification Programs

Available Versions :

V1: Binary 20 <

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : N-10 (operators panel)

Peripheral Requirements : Load device

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : FOUR-CHECK N-10

Description : Internal interrupt verification

Documentation : NORD-10 Verification Programs

Available Versions :

V1: Binary 20 <

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : N-10

Peripheral Requirements: Teletype (load device)

Software Requirements : None

Source Language : MAC

Other Comments :

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PROGRAM DESCRIPTION

Program Name : 10 FLOATING

Description : Floating point instruction verification program

Documentation : NORD-10 Verification Programs

Available Versions :

V1: Binary 20 <

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : N-10

Peripheral Requirements: Teletype (load device)

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : TREAL/N10

Description : Tests the real time clock

Documentation : User's Guide

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : N-10

Peripheral Requirements: Teletype, paper tape reader, real time clock

Software Requirements : None

Source Language : MAC

Other Comments :

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PROGRAM DESCRIPTION

Program Name : TSTAB/N10

Description : Tests the stability of the real time clock

Documentation : User's Guide

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : NORD-10

Peripheral Requirements: Teletype, paper tape reader, real time clock

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : TESTT/N10

Description : Tests the Teletype

Documentation :

Available Versions :

V1:

V2:

V3:

V4:

Program Size :

CPU Requirements : NORD-10

Peripheral Requirements: Teletype, paper tape reader

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : TREPU/N10

Description : Tests paper tape reader and punch

Documentation : User's Guide

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : NORD-10

Peripheral Requirements: Teletype, paper tape reader, paper tape punch

Software Requirements : None

Source Language : MAC

Other Comments :

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PROGRAM DESCRIPTION

Program Name : TECOD/N10

Description : Tests core and disk

Documentation : User's Guide

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : N-10

Peripheral Requirements: Teletype, paper tape reader, disk

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : CDC Formatting/N10

Description : Tests and formats the disk

Documentation : None

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : N-10

Peripheral Requirements: Teletype, paper tape reader, disk

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : DIMS/N10

Description : Tests the disk

Documentation : User's Guide

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : N-10

Peripheral Requirements: Teletype, paper tape reader, disk, maybe line printer

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : TCODR/N10

Description : Tests core and drum

Documentation : User's Guide

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : N-10

Peripheral Requirements: Teletype, paper tape reader, drum

Software Requirements : None

Source Language : MAC

Other Comments :

PROGRAM DESCRIPTION

Program Name : DRUMS/N10

Description : Tests the drum

Documentation : User's Guide

Available Versions :

V1:

V2:

V3:

V4:

Program Size : Less than 4K

CPU Requirements : N-10

Peripheral Requirements: Teletype, paper tape reader, drum, maybe line printer

Software Requirements : None

Source Language : MAC

Other Comments :

100 PROGRAM REFERENCE LISTS

PROGRAM REFERENCE LIST

Page	Program Name		V	Tape Identification	Mode	Price
1-2	BRL			PD-1149	S	300
1-2	BRL for NORD-1/NORD-20			PD-1166	RB	100
1-2	BRL for NORD-10			PD-1194	RB	100
1-2	BRL for TSS			PD-1195		100
2-3	MAC	(NORD-1/NORD-20)	V1	PD-1105	BRF	200
2-3	MAC	(NORD-10)	V2	PD-1181	BRF	200
2-4	SHORT MAC II		V1	PD-476	B	100
2-4	SHORT MAC II	(outmode)	V2	PD-487	B	100
2-5	MACM	(NORD-1)	V1	PD-1159	BRF	200
2-5	MACM	(NORD-1)	V2	PD-1106	B	200
2-5	MACM	(NORD-10)	V3	PD-1185	B	200
2-6	UBP	(drum)	V1	PD-711	S	100
2-6	UBP	(NCR disk)	V2	PD-712	S	100
2-6	UBP	(CDC disk)	V3	PD-1160	S	100
2-7	MAC TSS	(NORD-1)	V1	PD-1169	BRF	200
2-7	MAC TSS	(NORD-1)	V2	PD-1165	B	200
2-7	MAC TSS	(NORD-1)	V3	PD-1164	B	200
2-7	MAC TSS	(NORD-10)	V4	PD-1182	BRF	200
2-8	MACF	(NORD-1)	V1	PD-1162	B	200
2-8	MACF	(NORD-1)	V2	PD-1161	B	200
2-8	MACF	(NORD-10)	V3	PD-1183	B	200
2-8	MACF	(NORD-10)	V4	PD-1184	B	200

PROGRAM REFERENCE LIST

Page	Program Name		V	Tape Identification	Mode	Price
4-2	QED Text Editor				S	
4-2	QED Text Editor	(NORD-1)	V1		RB	
4-2	QED Text Editor	(NORD-10)	V2		RB	
4-2	QED Text Editor	(TSS subsystem)	V3		RB	
4-3	NORD Conversational Editor			PD-852	S	200
4-3	NORD Conversational Editor	(K)		PD-922	B	100
4-4	BRF Handler			PD-1227	S	300
4-4	BRF Handler	(NORD-10)	V1	PD-1228	RB	100
4-4	BRF Handler	(NORD-1)	V2	PD-1229	RB	100
4-4	BRF Handler	(TSS sub NORD-1)	V3	PD-1230	RB	100
4-4	BRF Handler	(TSS sub NORD-10)	V4	PD-1231	RB	100
4-5	KRYSSREF			PD-1177	S	200
4-5	KRYSSREF	(TSS subsystem)	V1	PD-1178	B	100
4-5	KRYSSREF	(NORD-OPS sub-system)	V2	PD-1179	B	200
4-5	KRYSSREF		V3	PD-1180	B	100
4-6	Commentary Text			PD-263+264	S	300
4-7	Disk Maintenance System (DIMS)			PD-445	S	200
4-7	Disk Maintenance System (DIMS)			PD-446	B	100
4-8	CTAP9 - Catsy Service Program			PD-777	S	200
4-9	COPY and VERIFY			PD-1107	S	100
4-9	COPY and VERIFY			PD-1108	B	100
4-10	2BPUN			PD-774	S/RB	100

PROGRAM REFERENCE LIST

Page	Program Name	V	Tape Identification	Mode	Price
10-3	FORTRAN IV Compiler (NORD-1)	V1	PD-1102	BRF	200
10-3	FORTRAN IV Compiler (new dev. No.)	V2	PD-979	RB	200
10-3	FORTRAN IV Compiler (old dev. No.)	V3	PD-977	RB	200
10-3	FORTRAN IV Compiler (TSS subsyst. 24K)	V4	PD-1150	B	200
10-3	FORTRAN IV Compiler (TSS subsyst. 32K)	V5	PD-1143	B	200
10-3	FORTRAN IV Compiler (NORD-OPS subsystem)	V6	PD-958	B	200
10-4	FORTRAN IV Run-time System	V1	PD-1170	BRF	200
10-4	FORTRAN IV Run-time System (new dev. No.)	V2	PD-978	BRF	200
10-4	FORTRAN IV Run-time System (old dev. No.)	V3	PD-980	BRF	200
10-4	FORTRAN IV Run-time System (NORD-OPS)	V4	PD-931		200
10-5	FLDR (FORTRAN IV Loader for TSS 24K)	V1	PD-1148		200
10-5	FLDR (FORTRAN IV Loader for TSS 32K)	V2	PD-1146		200
10-6	NORD FORTRAN IV Debugging Option		PD-962	BRF	200
10-7	RT-FORTRAN IV Compiler (old dev. No.)	V1	PD-915	RB	200
10-7	RT-FORTRAN IV Compiler (new dev. No)	V2	PD-917	RB	200
10-8	RT FORTRAN IV Run-time System		PD-916	BRF	200
10-10	FORTRAN II Compiler		PD-718	BRF	200
10-11	FORTRAN II Run-time System		PD-719	BRF	200
10-12	FORTRAN II Loader		PD-993	RB	200
10-14	RT FORTRAN II Compiler		PD-925	BRF	200
10-15	RT FORTRAN II Run-time System		PD-926	BRF	200
10-17	Mini-FORTRAN Compiler		PD-716	B	200
10-18	Mini-FORTRAN Run-time System		PD-717	BRF	200

PROGRAM REFERENCE LIST

Page	Program Name	V	Tape Identification	Mode	Price
11-2	BASIC for NORD TSS	V1	PD-1220	B	200
11-2	BASIC for NORD TSS	V2	PD-1221	B	200
11-3	BASIC Multiuser (NORD-1)	V1	PD-959	B	200
11-3	BASIC Multiuser (NORD-20)	V2	PD-1216	B	200
11-3	BASIC Multiuser (NORD-20)	V3	PD-1151	B	200
11-4	BASIC with link option (TSS subsyst.)	V1	PD-1222	B	200
11-4	BASIC with link option (One User N-1)	V2	PD-1223	B	200
11-4	BASIC with link option (One User N-10)	V3	PD-1224	B	200
11-5	BASIC One User (NORD-1/NORD-20)	V1	PD-1225	B	200
11-5	BASIC One User (NORD-10)	V2	PD-1226	B	200
19-2	TRAM		PD-191	S	300
19-2	TRAM		PD-472	B	200
20-3	SINTRAN II Monitor (Part I)		PD-1053	S	200
20-3	SINTRAN II Monitor (Part II)		PD-1054	S	200
20-3	SINTRAN II Monitor (Part III)		PD-1055	S	200
20-4	SINTRAN II I/O System		PD-1052	S	200
20-5	SINTRAN II Operators Communication		PD-1051	S	200
20-6	SINTRAN II IOLIB Interface Routines		PD-854	S	100
20-7	SINTRAN II RT Loader (Part I)		PD-927	S	200
20-8	SINTRAN II All Core Loader (FTN IV)	V2	PD-991	S	200
20-9	MACD		PD-862	S	200
20-10	SINTRAN II Restart (drum)		PD-863	S	100
20-10	SINTRAN II Restart (CDC disk)		PD-995	S	100
20-11	SINTRAN II Monitor Test Program		PD-1218	S	100
20-12	SINTRAN II I/O Test Program		PD-1219	S	100
20-13	SINTRAN II COPY Routine		PD-985	S	100

PROGRAM REFERENCE LIST

Page	Program Name	V	Tape Identification	Mode	Price
22-2	MINIT NCR One Sp.	V1	PD-842	S	100
22-2	MINIT Two Sp.	V2	PD-843	S	100
22-2	MINIT CDC One Sp. Ch.2	V3	PD-844	S	100
22-2	MINIT CDC Two Sp. Ch.2	V4	PD-845	S	100
22-2	MINIT CDC One Sp. Ch.1	V5	PD-909	S	100
22-2	MINIT CDC Two Sp. Ch.1	V6	PD-910	S	100
22-3	CDC Bootstrap Version A Ch.2	V1	PD-902	B	100
22-3	CDC Bootstrap Version B Ch.2	V2	PD-903	B	100
22-3	CDC Bootstrap Version A Ch.1	V3	PD-907	B	100
22-3	CDC Bootstrap Version B Ch.1	V4	PD-908	B	100
22-4	NCR Bootstrap Version A Sp. 0	V1	PD-904	B	100
22-4	NCR Bootstrap Version B Sp. 0	V2	PD-905	B	100
22-4	NCR Bootstrap Version A Sp. 1	V3	PD-953	B	100
22-4	NCR Bootstrap Version B Sp. 1	V4	PD-954	B	100
22-5	TSS STION for MAC		PD-1213	S	100
22-6	Subsystem Tape 1 for TSS		PD-1200	B	300
22-7	Subsystem Tape 2 for TSS (24K)	V1	PD-944	B	300
22-7	Subsystem Tape 2 for TSS (32K)	V2	PD-945	B	300
24-2	Standard NORD-1 Interrupt System		PD-248	S	100
24-3	LUNAR Landing		PD-471	SB	100

PROGRAM REFERENCE LIST

Page	Program Name	V	Tape Identification	Mode	Price
26-2	MINIMON		PD-1000	S	200
30-2	STIO1		PD-818	S	200
30-3	STIO2		PD-466	S	200
30-4	Data Channel Device Drivers		PD-955	S	200
30-5	CUTR37 (Catsy 100 drivers)		PD-819	S	300
35-2	I/O Formatting Routine Package		PD-722	S	200
40-2	Double Precision Arithmetic Routines		PD-780	S	200
40-3	Re-entrant Library		PD-1170	BRF	200
44-2	NORD Commercial Subroutine Package		PD-723	S	200
46-2	NPP - NORD Plot Package		PD-856	BRF	200

PROGRAM REFERENCE LIST

Page	Program Name	V	Tape Identification	Mode	Price
50-2	N1SIM		PD-772	B20	100
50-2	N1SIM		PD-773	RB	100
50-3	2BCOM/INTH		PD-771	S	200
50-4	SIMUL1		PD-463	S	200
50-5	SIMUL2		PD-762	S	200
50-6	SIMUL3		PD-957	S	200
50-7	MOBO		PD-782	RB/S	150
50-8	2BPUN		PD-774	RB/S	150
55-2	MESYS		PD-783	S	200
55-3	MGEN		PD-468	S	200
55-3	MGEN		PD-469	B	100
55-4	MESUB (MESYS Subroutines)		PD-784	S	200

PROGRAM REFERENCE LIST

Page	Program Name	V	Tape Identification	Mode	Price
90-2	Memory test	V1	PD-933	B	100
90-2	Memory test upper	V3	PD-1176	B	100
90-3	Instruction check 1 octal	V1	PD-14	Octal	100
90-3	Instruction check 1	V2	PD-314	B	100
90-4	Instruction check 2		PD-315	B	100
90-5	Instruction check 3		PD-19	B	100
90-6	Floating debugger & data		PD-973	B	100
90-7	Memory protection test program		PD-184	B	100
90-26	PERMI	V1	PD-735	B	100
90-8	RTCLK		PD-812	B	100
90-17	CDC-formatting	V1	PD-870	B	100
90-18	DIMS (NCR, ch.0)	V1	PD-446	B	100
90-18	DIMS (CDC, ch.1)	V2	PD-875	B	100
90-18	DIMS (CDC, ch.2)	V3	PD-865	B	100
90-9	TESTT	V1	PD-831	B	100
90-16	MINIT/NCR, one spindle	V1	PD-842	B	100
90-16	MINIT/NCR, two spindles	V2	PD-843	B	100
90-16	MINIT/CDC, one spindle, ch.1	V3	PD-909	B	100
90-16	MINIT/CDC, one spindle, ch.2	V4	PD-844	B	100
90-16	MINIT/CDC, two spindles, ch.1	V5	PD-910	B	100
90-16	MINIT/CDC, two spindles, ch.2	V6	PD-845	B	100
90-20	Magtape test Kennedy Magtape		PD-363	B	100
90-13	LPT	V1	PD-884	B	100
90-22	DRUMV B		PD-384	B	100
90-15	TECOD/NCR, ch.0	V3	PD-450	B	100
90-15	TECOD/CDC, ch.2	V2	PD-867	B	100
90-15	TECOD/CDC, ch.1	V1	PD-876	B	100
90-12	I/O Interrupt test and card reader test		PD-987	B	100
90-21	CVER40		PD-928	B	100
90-10	Test REA and PFA		PD-912	B	100
90-11	TCARD	V1	PD-889	B	100
90-19	Magtape test (HP)		PD-770	B	100
90-14	IOFRQ	V1	PD-1114	B	100

PROGRAM REFERENCE LIST

Page	Program Name	V	Tape Identification	Mode	Price
90-17	CDC formatting		PD-1168	B	100
90-46	DIMS/N10		PD-1174	B	100
90-42	TESTT/N10		PD-1206	B	100
90-47	TCODR/N10		PD-1136	B	100
90-48	DRUMS/N10		PD-1138	B	100
90-40	TREAL/N10		PD-1154	B	100
90-41	TSTAB/N10		PD-1156	B	100
90-43	TREPU/N10		PD-1158	B	100
90-44	TECOD/N10		PD-1172	B	100
90-38	FOUR-CHECK N10		PD-1186	B	100
90-37	THREE-CHECK N10		PD-1188	B	100
90-36	TWO-CHECK N10		PD-1190	B	100
90-35	ONE-CHECK N10		PD-1192	B	10
90-39	10 FLOATING		PD-1196	B	100
90-34	Memory test N10		PD-1198	B	100

PROGRAM REFERENCE LIST

Page	Program Name	V	Tape Identification	Mode	Price
90-28	TIN20	V1	PD-952	B	100
90-28	TIN20 (load from TTY)	V2	PD-989	B	100
90-2	Memory test	V1	PD-933	B	100
90-2	Memory test (load from TTY)	V2	PD-939	B	100
90-2	Memory test upper	V3	PD-1176	B	100
90-27	Instruction check II	V1	PD-759	B	100
90-27	Instruction check II (load from TTY)	V2	PD-938	B	100
90-26	PERMI	V1	PD-735	B	100
90-26	PERMI (load from TTY)	V2	PD-940	B	100
90-29	RCLK2	V1	PD-810	B	100
90-29	RCLK2 (load from TTY)	V2	PD-1132	B	100
90-30	PFAIL		PD-914	B	100
90-9	TESTT	V1	PD-831	B	100
90-9	TESTT (load from TTY)	V2	PD-937	B	100
90-31	TLINE	V1	PD-965	B	100
90-31	TLINE (load from TTY)	V2	PD-966	B	100
90-13	LPT	V1	PD-884	B	100
90-13	LPT (load from TTY)	V2	PD-934	B	100
90-10	Test REA and PFA		PD-912	B	100
90-11	TCARD	V1	PD-889	B	100
90-11	TCARD (load from TTY)	V2	PD-935	B	100
90-14	IOFRQ	V1	PD-1114	B	100
90-14	IOFRQ (load from TTY)	V2	PD-1133	B	100
90-32	CLK2B (check clock on NORD-2B)		PD-1110	B	100