SPERRY

MASP

Meta Assembler Scientific Processor

for the 1100 Series

The Sperry Meta Assembler Scientific Processor assembles source code for execution on an 1100/90 Integrated Scientific Processor. The Meta Assembler Scientific Processor itself executes on any 1100 Series processor.

FEATURES

The Meta Assembler Scientific Processor features:

- Instructions that are easy to use and remember.
- Directives to ease the task of storage operand addressing.
- Careful error checking and meaningful error messages.

MASP source elements are assembled using the 1100 Meta-Assembler (MASM). MASP is a set of MASM procedures invoked by the user.

MASP syntax is the standard MASM syntax. The Integrated Scientific Processor instruction mnemonics are actually MASM procedures, but appear as simple instructions to the user.

In addition to the MASP features, a user has the standard MASM features, including the capability to write procedures and functions and build directives, labels, or expressions.

PREREQUISITES

Hardware

MASP will assemble on any supported 1100 System meeting the minimum hardware system configuration requirements for that system. The output of MASP requries the 1100/90 Integrated Scientific Processor for execution.

Software

MASP requires the following software products:

SCS – Series 1100 System Control Software
MASM – Series 1100 Meta-Assembler

If Object Module output is to be generated, the following software is also required:

Linking System

EDUCATION

Customer education is available from Sperry as a chargeable item.

SUPPORT

Sperry will endeavor to correct significant errors related to this software. Sperry does not represent or warrant that all errors will be corrected.

ORDERING INFORMATION

This product, with its documentation, is available on a worldwide basis. To order, contact your local Sperry sales representative, distributor, or dealer.

Type Number	System
7673-xx	1100/60, 1100/70, 1100/80, 1100/90

SPERRY

UFTN
Universal Compiling System FORTRAN

for the 1100/90

The ANSI X3.9-1978 standard (FORTRAN 77) has been implemented in the Sperry 1100 Series Universal Compiling System FORTRAN (UFTN) language processor. UFTN contains many extensions to FORTRAN 77 that enhance the functionality of the system, e.g., several array programming capabilities.

FEATURES

UFTN generates code for execution in extended mode on the 1100/90 Instruction Processor and the 1100/90 Integrated Scientific Processor.

Some of FORTRAN 77 language extensions implemented in UFTN are as follows:

- Internal subroutines (allow inclusion of subroutines within others that share program Global Data)
- Double-precision complex data type
- ENCODE/DECODE statements (storage-to-storage capability)
- Namelist I/O
- INCLUDE statement (copy external source into FORTRAN compilation)
- DELETE statement (compile-time deletion of source statements)
- Ending comments on source line
- 31 character variable names
- Array extensions
  - Array-valued expressions and assignment statements
  - Identified arrays
  - Array sections
  - Conditional array statements (WHERE)
  - PACK and UNPACK statments
  - Array-valued intrinsics

UFTN also provides several features toward complete utilization of the Series 1100 architecture and Operating System. These include:

- Reentrant common-banked compiler and reentrant code generation
- Use of common-banked library routines
- Interlanguage communication with other Universal Compiling System (UCS) languages
- Handling of complete ASCII/ISO character data
- Multiple data banks and instruction banks extending the object program size well beyond 262,000 words
- Extensive object program optimization. On option, an object module will be produced that has been extensively optimized by the compiler to execute more rapidly
- Sort/Merge capability

PREREQUISITES

Hardware

UFTN will operate on any 1100/90 System meeting the minimum hardware system configuration requirements for that specific system. The object code is optimized for execution on the 1100/90 Integrated Scientific Processor.

Software

UFTN requires the following software products for operation:

SCS – Series 1100 System Control Software (with extended mode)
Linking System
LSS 1100 – Series 1100 Language Support System (with features for extended mode and Integrated Scientific Processor, if required)
PCIOS – Processor Common Input/Output System

EDUCATION

Customer education is available from Sperry as a chargeable item.

SUPPORT

Sperry will endeavor to correct significant errors releated to this software. Sperry does not represent or warrant that all errors will be corrected.

ORDERING INFORMATION

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Type Number	System
7670-00	1100/90

SPERRY

UVEC
UCS FORTRAN Vectorizer

for the 1100/90

The Sperry 1100 Series Universal Compiling System (UCS) FORTRAN Vectorizer is a FORTRAN source-to-source translator that converts scalar syntax into UCS FORTRAN array syntax.

FEATURES

In converting a FORTRAN program to array syntax, the UCS FORTRAN Vectorizer informs the user of the actions taken on the program such as which loops were vectorized, which loops were not vectorized, the reasons for the rejection, etc. In addition, the user can pass information and commands to the UCS FORTRAN Vectorizer via directives inserted into the program to assist in vectorization.

The UCS FORTRAN Vectorizer is capable of recognizing the following situations and converting them into the appropriate syntax:

- Both loop-dependent and loop-independent conditional assignments, forward transfers, and block IFs.
- Propagation of scalar temporaries into temporary vectors.
- Recognition of reduction functions, including vector summation, dot product, minimum or maximum element, and vector product.
- Data dependency analysis to determine if a loop is safe for vectorization.
- Partial vectorization of loops that contain isolated recursion.
- Nontrivial subscript and index variable expressions.
- Indirect addressing.
- Ability to split subroutine and function calls into separate loops.
- Statement function expansion.
- Use of an index as part of the calculation.
- Use of functions that have vector versions.
- Vectorization of outer loops.

PREREQUISITES

Hardware

The UCS FORTRAN Vectorizer will operate on any 1100/90 System meeting the minimum hardware system configuration requirements for that specific system.

Software

The UCS FORTRAN Vectorizer requires the following software products for operation:

SCS – Series 1100 System Control Software (with extended mode)
LSS 1100 – Series 1100 Language Support System
PCIOS – Processor Common Input/Output System

EDUCATION

Customer education is available from Sperry as a chargeable item.

SUPPORT

Sperry will endeavor to correct significant errors related to this software. Sperry does not represent or warrant that all errors will be corrected.

ORDERING INFORMATION

This product, with its documentation, is available on a worldwide basis. To order, contact your local Sperry sales representative, distributor, or dealer.

Type Number	System
7671-00	1100/90

SPERRY

EML
Extended Math Library

for the 1100/90

The Sperry Extended Math Library (EML) provides FORTRAN callable mathematical functions and subroutines beyond those provided with the FORTRAN compiler (UFTN) and the common math library, included in UFTN. The EML is designed for use on the 1100/90 Integrated Scientific Processor but it is also available for use on the 1100/90 Instruction Processor (IP).

Many of the EML routines have the same name and function as routines available in the public domain or on other computer systems. The EML, however, was created specifically for use with Sperry computers. This allows the EML routines to make the best use possible of the features of the Sperry systems.

FEATURES

The EML includes the functions and subroutines most used by the scientific computing community today. Sophisticated libraries freely available from outside sources, such as LINPACK™ and EISPACK™, are not included, in order to focus the scope of the EML. The BLAS (Basic Linear Algebra Subroutines) are included, because they are a basic building set for many other programs.

All the routines in the EML are available for execution on either the 1100/90 Instruction Processor or the Integrated Scientific Processor. For some of the routines, the Integrated Scientific Processor version is written in assembler language.

The EML has the following features:

- Fast Fourier Transforms (FFTs)
- Convolution integrals
- Correlation routines
- Solution to the Weiner-Levinson equation
- Geophysical calculations
- BLAS (Basic Linear Algebra Subroutines)
- Machine precision characterisitics

PREREQUISITES

Hardware

The EML may be executed on the 1100/90 Integrated Scientific Processor, or on any 1100/90 Instruction Processor that supports Extended Mode addressing.

Software

The EML requires the following software product for operation:

SCS – Series 1100 System Control Software

The EML routines assume that programs calling them use Extended Mode addressing.

EDUCATION

Customer education is available from Sperry as a chargeable item.

SUPPORT

Sperry will endeavor to correct significant errors related to this software. Sperry does not represent or warrant that all errors will be corrected.

ORDERING INFORMATION

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Type Number	System
7672-00	1100/90

SPERRY

PEER

Program Execution Evaluation Routine

for the 1100/90

The Sperry 1100 Series Program Execution Evaluation Routine (PEER) provides an Integrated Scientific Processor user with methods to identify software performance problems for those portions of MASM or FORTRAN programs that execute on the Integrated Scientific Processor. This is accomplished by using a statistical sampling technique.

FEATURES

The statistical sampling technique is used to capture the address of the next instruction scheduled for execution. Collection of data is performed on the Integrated Scientific Processor, whereas the data reduction portion of PEER executes on the Series 1100 Instruction Processor and uses as input the data collected on the Integrated Scientific Processor. PEER reports provide information that allow an evaluation as to which portions of a program account for the greatest percentage of execution time.

PREREQUISITES

Hardware

PEER will operate on any 1100/90 Integrated Scientific Processor System meeting the minimum hardware system configuration requirements for that system.

Software

PEER requires the following software products for operation:

SCS – Series 1100 System Control Software including EXEC level 40R1

EDUCATION

Customer education is available from Sperry as a chargeable item.

SUPPORT

Sperry will endeavor to correct significant errors related to this softwre. Sperry does not represent or warrant that all errors will be corrected.

ORDERING INFORMATION

This product, with its documentation, is available on a worldwide basis. To order, contact your local Sperry sales representative, distributor, or dealer.

Type Number	System
7669-00	1100/90

UA-0913 Program Product Specification 8504 Printed in U.S.A.