

INTERNAL USE ONLY

INTERNATIONAL COMPUTERS AND TABULATORS LIMITED

Programming Languages Division
I.C.T. 1900 Series

FORTRAN NOTE 20
18.1.66

Provisional specification of the 1900 Fortran compiler

This specification relates to the pre-release versions of the ASA Fortran compilers; ~~##ZFAM~~ (magnetic tape version) and ~~##ZFAP~~ (paper tape version). The compilers due for release on 1.3.66 will be named ~~##XFAM~~ and ~~##XFAP~~ and will not necessarily be to the same specification as given in this note.

This series of notes is intended for reference by the writers of the compilers and associated software. This particular note and Fortran Note 19 is being given a wider circulation than usual because they give details of interest to programmers using the ASA Fortran compilers.

- DRAFT -
(PROVISIONAL)

#ZFAM

#ZFAP

TITLE

1900 Fortran compiler

ISSUE

1

HARDWARE REQUIREMENT

	<u>#ZFAM</u>	<u>#ZFAP</u>
Core store:	12000 words	13000 words
Input peripheral:	1 paper tape reader and/or 1 card reader and option- ally 1 or more magnetic tape decks	1 paper tape reader and/or 1 card reader and optionally 1 or more magnetic decks
Output peripheral:	1 magnetic tape deck	1 paper tape punch
Listing peripheral:	1 lineprinter and/or 1 tape punch	1 lineprinter and/or 1 tape punch
Other peripherals:	2 magnetic tape decks (Work tape plus program library tape)	None

USE OF PERIPHERALS

Source program and/or semi-compiled program may be input from either paper tape, cards, or magnetic tape. Initially, according to choice, a paper tape reader or card reader is allotted; thereafter the input device is selected dynamically under control of the program. A paper tape or card reader is retained throughout a compilation, even if the bulk of the source is on magnetic tape.

Normally a lineprinter is allotted at the start of the run to receive a listing of the source program and error information, if any. A tape punch may be used as an alternative, in which case a listing will be given in an abbreviated form.

The other peripherals used depend on the version of the compiler.

a) /ZFAP

A scratch magnetic tape is opened at the start of a run and used as a work tape. It is left scratch.

A magnetic tape, normally the program library tape, containing the Fortran library must be available throughout the run.

At the end of a successful compilation a second scratch tape, or a tape with a specified name, is opened, given a specified name and retention period, and used to receive the object program.

b) /ZFAP

A paper tape punch is used to receive the object program. Output will cease on the occurrence of an error, and the punch will be released.

Allocation and release of peripherals:

All peripherals are allocated dynamically as and when required.

A special entry point is provided to release all peripherals. During the course of a run peripherals will only be released when a change is made (e.g. switching from cards to paper tape input).

Since a list is kept within the compiler of all peripherals being used, console allocation and release of peripherals should be avoided.

DESCRIPTION

a) General

The A.S.A. FORTRAN IV compiler will translate FORTRAN segments into standard 1900 semi-compiled form and will optionally attempt to consolidate these segments, and any other semi-compiled segments that may be provided, into a complete object program. The FORTRAN segments should be written in the version of the language described in the "I.C.T. 1900 Manual" (Provisional edition Dec. 1965).

For a complete program the compiler will automatically produce an executable program, complete with General Purpose Loader. For one or more segments not forming a complete program the compiler will produce only semi-compiled segments. At a later stage these segments may be re-input to the compiler along with other FORTRAN and/or semi-compiled segments that together form a complete program.

For the A.S.A. Fortran IV compiler a Program Description must be provided. This is read prior to input of source or semi-compiled program, and enables compile time and object time parameters to be specified by the user. Further details are given under the heading INPUT PARAMETERS.

During compilation, unless specified otherwise, a listing is given on a lineprinter of the source program and error information (if any).

b) Input

Input to the compiler may be on paper tape in the standard 1900 eight-track code and/or on punched cards in the 1900 card code. Source or semi-compiled program may also be input from magnetic tape.

A program basically consists of one or more segments followed by a FINISH statement. There must be one and only one MASTER segment. The program may contain only FORTRAN segments, only semi-compiled segments or a mixture. Segments may be in any order: in particular, the MASTER segment need not appear first.

All of these segments will be incorporated in the object program, except that if two or more segments with the same name are input, only the first one is incorporated. The FINISH statement causes the compiler to arrange for any required segments from the FORTRAN library to be incorporated. This includes segments that are private to the Fortran compiler, e.g. Fortran Input/Output package.

If the user has a series of subroutine and function segments that form a private library they may be read after a LIBRARY statement and should precede the FINISH statement. Before a FINISH or LIBRARY statement the compiler will incorporate into the object program all segments encountered. After a FINISH or LIBRARY statement has been encountered only those segments to which a reference has previously been made are incorporated. Segments in a private library will normally be in semi-compiled form, but they could be in FORTRAN source form.

Any semi-compiled segments input to the FORTRAN compiler may have been previously produced by the FORTRAN compiler or by the PLAN assembler.

