0. Introductory Remarks

At its meeting in Los Angeles in September 1973, WG 2.1 established in place of its former subcommittees a Subcommittee on ALGOL 68 Support with R. Uzgalis as convenor. The first meeting of this subcommittee was organised by S. Bourne in Cambridge from April 7-10, 1974. The following is a report on that meeting, prepared mainly for WG 2.1 members, but also for other interested parties.

{ What in me is dark
Illumine, what is low raise and support;
That to the height of this great argument
I may assert eternal Providence,
And justify the ways of God to Men.
Paradise Lost, Milton.}

a) Participants: A.D. Birrell (Cambridge), H. Boom (Edmonton), S.R. Bourne (Cambridge), P. Branquart (Brussels), I. Currie (Malvern), R. Fisker (Manchester), M.J.T. Guy (Cambridge), P. Hudec (Manchester), P.R. King (Winnipeg), C.H. Lindsey (Manchester), B.J. Mailloux (Edmonton), L.G.L.T. Meertens (Amsterdam), J.E.L. Peck (Vancouver), S.A. Schuman (Grenoble), G.H.J. Sturgess (Pasadena), B. Willis (Berlin), P. Hibbard (Liverpool), M. Munro (Durham), I. Cottam (Liverpool), G. Barrett (Liverpool), I. Walker (Cambridge), J. Watt (Liverpool).

b) Documentation: Fifteen documents were discussed by the meeting; these are listed below and copies may be available from their respective authors.

c) Aims of meeting:
   i) Final discussion of and revisions to the Report.
   ii) To consider certain proposed enhancements to ALGOL 68 by means of upwards compatible extensions, in particular, the topics of modularity, partial parametrization, modals and record transfer.
   iii) A discussion of III activity.
iv) Consideration of sublanguages for the benefit of the subcommittee on sublanguages.

v) To discuss the future role of the subcommittee, its membership and how it should interact with WG 2.1, the editors of the ALGOL 68 Report and other interested bodies, together with a discussion of the possible areas of future work of WG 2.1.

d) P.G. Hibbard and P.R. King were elected as chairman and secretary respectively for this meeting.

1. Final discussion of and revisions to the Report

Two documents (CAM-1, CAM-1A) were presented by the editors as the current state of the Report; these two will be referred to as the "current report" and have been distributed to all AB readers. Two documents (CAM-8, CAM-9) of further errata were presented; most of these were of a trivial nature and required no discussion but an important subset of them dealing with various aspects of the transput section were thoroughly discussed. Other position papers on transput (CAM-2, CAM-13) were presented and included in the discussion, and a summary of the topics for discussion and decision was prepared by C.H. Lindsey (CAM-14). The following lists the recommendations of the meeting to the editors of the report; only points on which positive decisions were taken are included.

i) {An event has happened, upon which it is difficult to speak, and impossible to be silent.
Impeachment of Warren Hastings,
Edmund Burke.}

That the "looping" philosophy expounded in §A of CAM-2 be adopted, with corresponding changes to the transput routines. In summary, this means that in the following situation:

a transput routine is called,
in the sequence of tests preceding the transput action an "event" is detected,
the corresponding event routine is called and returns true, an event (possibly the same one) is detected,
rather than calling undefined, an event routine will again be
called, even though this raises the possibility of an infinite loop. The current report is a compromise between these two extremes.

ii) That detection of logical file end should take place before physical file/page/line detection, for the reasons outlined in CAM-2 §B2b.

iii) That there shall be no default write mood for newly opened files as at present. Some of the background for this is given in CAM-2, §B4e, although the recommendation made there for a default read mood was not accepted.

iv) For consistency, there will be no default transition to newline while getting a numeric value, that is, the number must all appear on a single line. The current report permits such a transition after "", "e" (or "e") and before and after ""i" (or "'"), but not after a sign. Initial newlines will, of course, still be ignored.

v) {A place for everything, and every-
thing in its place.

Thrift, Samuel Smiles.}

In order to alleviate a number of problems which have come to light with the interpretation of position in a file in the current report (§§B2a,b) of CAM-2 for example), a new model of this concept was proposed by M. Guy (CAM-13). Briefly, in this new model, a position is a point between characters (lines, pages) of a book, and the "exterior region" which the current report assumes exists outside the bounds of a book is no longer needed; otherwise the two models are isomorphic, and the non-existence of such problems in the new model can be guaranteed. Accordingly, the editors were strongly recommended to make such changes to the transport routines as are needed to alter the concept of position in files to conform to the model outlined in CAM-13. A preliminary study has indicated that less change to the report will be needed than might have been feared.
vi) It was felt that the instruction
(opened OF file | UP gremlins | UP bfileprotect)
and in particular the instruction
UP gremlins
within the routine open ($\$10.314d$) of the current report does not
make its intention sufficiently clear. Accordingly, the pragmatic
remark in $\$10.314d$ starting
"(This may for example, ..."
will be rewritten to clarify the intent of this instruction.

vii) {A man may write at any time, if he
will set himself doggedly to it.
Life of Johnson, Boswell.}

The current report does not explicitly prohibit writing to a book
whose field putting is false; this may be achieved by having two
channels via which the same book is linked (CAM-2, §B4a). A book will
thus now contain an integral field "users" to count the number of
times a book has been opened; this field will be inspected within the
open routine to ensure that a book cannot be opened for writing as
long as it is opened on some other file.

viii) In the current report, if an associated file is closed or locked
a scope error results thus preventing associated files from
being chained in a chain of bfiles. This situation will be
remedied.

2. Enhancement of ALGOL 68 by means of upwards compatible extensions

i) Modularity. An important document on the subject of modularity
(CAM-10) was presented by S. Schuman and discussed by the meeting.
Other proposals or suggestions on the subject were made by
G. Sturgess, A. Birrell (CAM-12) and S. Bourne. The meeting felt
that the proposals of S. Schuman encompassed these other
suggestions but are presently somewhat too broad and not intended
to be specifically ALGOL 68 oriented. Consequently, S. Schuman
was asked to form a small group to further investigate the work
and to prepare an ALGOL 68 oriented formulation of the proposals
for the next subcommittee meeting.
ii) Partial parametrization. C.H. Lindsey presented a document (CAM-6) expounding a proposal for partial parametrization, from which the following are two simple illustrations:

\[
\text{proc } f = (\text{real } x, y) \text{ real: } x+y; \\
\text{proc (real)} \text{ real } g := f(3,); \\
x := g(4) \text{ or } x := f(3,)(4) ; \\
\text{op** = (proc (real) real } a, \text{ int } b) \text{ proc (real) real: } \\
((\text{proc (real) real } a, \text{ int } b, \text{ real } p) \text{ real: } \\
(\text{real } x := 1; \text{ to } b \text{ do } x \times a (p) \text{ od}; x))(a, b,); \\
\text{real theta; print((cos**2)(theta)+(sin**2)(theta)))}
\]

It was felt that the proposal was very close to that required and preferable to earlier proposals made in this area and considered by WG 2.1. C.H. Lindsey will bring a more final form of the proposal to the next subcommittee meeting.

iii) Record transfer. A paper on record handling and transfer (CAM-4) was presented by P. Hudec. While it was agreed that some form of record transfer is a highly desirable extension, due to lack of time, serious consideration of this proposal was postponed to the next meeting.

iv) Modals. The topic of modals was discussed with particular reference to a proposal of C.H. Lindsey (CAM-6). It was felt that much more work on this topic is needed in future meetings. The feeling was that this particular proposal is not sufficiently broad and also suffers from the implementation requirement that all references to all modes be of the same size.

3. III Activity

Progress reports from members engaged in implementation activity were presented. These were

i) H. Boom (Full revised language on IBM 360. 4 of 5 passes complete; object code generator currently being written)

ii) G. Sturgess (Implementing a dialect on Burroughs B1700. Lexical scanner and parser complete; work on
coercion and balancing pass currently being started)

iii) S. Bourne  
(ALGOL 68-C currently running on IBM 370/165; compiles into intermediate code for ease of portability)

iv) P. King  
(Large subset of revised language on IBM 370/158; parser complete; coercion pass fully designed and partly coded)

v) P. Hibbard  
(Revised sublanguage running in one pass on Modular 1; operator and priority declarations currently being added)

vi) I. Currie  
(Third version of ALGOL 68-R compiler currently underway for new range of ICL machines)

vii) J.E.L. Peck  
(Five pass compiler for full language on IBM 360, 370; some ALGOL 68 source programs have successfully run.)

Some information on other implementations was gleaned from a summary of the (rather disappointing) response to the III questionnaire distributed by R. Uzgalis. Members were also reminded of the International Conference on ALGOL 68 Implementation being held at the University of Manitoba, June 18-20, 1974.

4. Sublanguages

P.C. Hibbard presented a document (CAM-3) containing details of ALGOL 68S and asked for opinions and discussion of the following aspects of the document and sublanguage:

i) No formatted transput. There was complete agreement on this.

ii) The restriction that all defining occurrences should precede corresponding applied occurrences. There was agreement on this point both on account of the ease of teaching such a rule and as it will considerably aid single-pass implementations.

iii) The mode equivalencing algorithm, which is as in the current report excluding all considerations of unions (which are not in the sublanguage) but for which a simple single-pass implemen-
tation exists, which requires a list of (only) recursive modes to be kept and the equivalencing algorithm to be applied to each new recursive mode as it is encountered. There was agreement, but C.H. Lindsey pointed out that mutually recursive modes can be implemented in 1-pass, although they should probably be excluded for such other reasons as teaching. It was felt that some more thought might profitably be given to this point.

iv) The rules for identification of operators (which do not require the implementer of a 1-pass system to keep a list of operators with their modes as with the full language; see §442e of CAM-3 for full details). Full agreement.

v) The form of the documentation, which will consist of

1. a list of changes to the syntax of the final version of the current report; this will be the definition of the language and will demonstrate that it is indeed a sublanguage.

2. a revised form of CAM-3 with details of denotations, representations, transput and examples. Full agreement.

5. Organisational Matters

i) It was agreed that the next meeting be held in Utrecht as part of the WG 2.1 meeting in August 1974, with a further meeting in Los Angeles in January 1975.

ii) It was agreed that a summary of the meeting be circulated to all WG 2.1 members via the AB (or direct mailing if there is insufficient time) by the acting secretary.

iii) It was agreed that the following proposed membership list of the subcommittee be submitted to WG 2.1 for approval:


The meeting concluded with votes of thanks to the host, Steve Bourne, and to the acting chairman and secretary.

P.R. King
University of Manitoba
April/May 1974

List of Errata to CAM-1.

Remarks on the transput section of the revised report.
Mathematisch Centrum, Amsterdam.


Features in ALGOL 68 for handling records I.P. Hudec.
Department of Computer Science, University of Manchester, January 1974.

A revised ALGOL 68 hardware representation for ISO-code and EBCDIC W.J. Hansen, Department of Computer Science, University of Illinois, Urbana. October 18, 1974.

Partial parametrization and modals C.H. Lindsey 74-04-05.

Examples illustrating the use of modals and images for record transfer and transformation description. I.P. Hudec. 74-04-04.


Changes required to are known bugs: category A. R.G. Fisker and C.H. Lindsey. 74-04-05.

Toward modular programming in high-level languages.
S.A. Schuman, IBM Scientific Centre, Grenoble, France.

(Errata and Suggestions). A. Bährs and J.E.L. Peck. 74-3-23.


Transput notes. M.J.T. Guy, 74-04-09.

(List of possible changes to transput). C.H. Lindsey.

Identity relations for REF [ ]X. M.J.T. Guy, 74-04-10.