3.7.3 Summary

The following notes show the facilities which are available in formatted input/output.

1. A set of five procedures which handle fixed format data in units of one single number at a time. They are:

Group (1): sfread , sfwrite

Group (2): sread , swrite

Group (3): sclose

Calls of the routines must use one procedure call from group (1) coupled with the relevant one from group (3), separated by any number of calls from group (2). They must not be mingled with other forms of input/output.

Data may be on cards or paper tape, and results may be on the paper tape punch or on line printer.

2. The inclusion of the data-handling procedures is achieved by specifying library A27.

3.8 LIBRARY REQUESTS

The following is a list of the library requests which may be incorporated in the ALGOL text when it is presented to the 'Assemble' phase of POST. These library requests should be made in the outermost block of an ALGOL program immediately after the first begin or within the outermost procedure declaration of a segment (that is the segment procedure) and before the first statement in the segment. For combination of Libraries see 3.8.2.

Library C1 (section 21.50 of KDF9 S.R.L.M) is now declared within library A30, the improved standard functions. Therefore, library C1 and A30 should not be declared in the same program. If library Aø is used then library C1" must be declared within users program.

A1 'open' and 'close'

This specifies the full input/output conversion package and the full peripheral device handling process.

A2. 'open' (input) and 'close'

This specifies the input conversion package and the input peripheral device handling process only. (Must NOT be used for output or a failure will ensue at run time).

A3. 'open' (output) and'close'

This specifies the output conversion package and the output peripheral device handling process only (Must NOT be used for input or a failure will ensue at run time).

A4. 'read', 'read boolean'

Either A1 or A2 must be specified in conjunction with this request or failure will occur during Usercode compilation.

A5. 'write', 'write boolean', 'output', 'format'

Either A1 or A3 must be specified in conjunction with this request or failure will occur during Usercode compilation.

A6. Standard Input/Output package

This specifies the normal input/output requirement and comprises A1, A4, A5, A15. This request is entirely self-contained.

A7. 'find', 'interchange', 'dataskip', 'btc', 'etw', 'rewind'

This is a standard magnetic tape handling package. A1 must be specified with this request UNLESS the labels for 'find' are NOT read from paper tape, in which case A3 will suffice.

A8. 'read binary', 'skip'

If this is used A7 must also be specified.

A9. 'write binary'

If this is used A7 must also be specified.

A10. 'read array'

If this is used A4 (or A16 as appropriate) must be specified. A1 must also be specified when the program is non-segmented.

A11. 'write array'

If this is used A5 must also be specified.

A12. 'gap', 'tab', 'newline', 'space'

Either A1 or A3 must be specified in conjunction with this request.

A13. 'charin', 'charout', 'in basic symbol', 'out basic symbol'

This is the character handling package and is used with A3 if character output only is required or A2 if character input only is required (this combination should not be used with non-segmented ALGOL) or A1 if both character input and output are required.

A14. 'copy text'

A1 must be specified with this request.

A15. 'write text'

Either A1 or A3 must be specified with this request.

A16. 'read' 'read and boolean' (special read)

Either A1 or A2 must be specified in conjunction with this request or failure will occur during usercode compilation and must not be used with A4 or A6.

A17. Standard input/output package with special read

This specifies the normal input/output requirement and consists of A1, A16, A5, A15. This request is completely self contained.

A18. 'instring' 'intext', 'transfer'

This is the standard "text into arrays" package.

A19. 'outstring', 'outtext', 'copy'

This is the standard "text out of arrays" package.

A20. Standard "text handling routines"

This is the combination of A18 and A19.

A21. 'write', 'format', 'formatstring', 'output', 'writeboolean'

This must not be usedwith A5 or A6. A1 must be specified in conjunction with this request or a failure will occur during Usercode compilation, if used in the non-segmented system.

A22. 'read binary' and its derivatives, and 'skip'

This must not be used with A8. If this is used, A7 (or A26) must be specified.

A23. 'write binary' and its derivatives

This must not be used with A9. If this is specified, A7 (or A26) must be specified.

A24. 'read array' and its derivatives

This must not be used with A10. If this is used A7 (or A26) and A4 (or A16) must also be specified. In the non-segmented system, A1 must also be specified.

A25. 'write array' and its derivatives

This must not be used with A11, A5 and A7 (or A26) must be specified if this is used.

A26. 'sfind', 'interchange', 'dataskip', 'rewind', 'btc', 'etw'

This must not be used with A7. This is a standard magnetic tape handling package.

A27. 'sfread', 'sfwrite', 'sread', 'swrite', 'sclose'

This package contains the fixed format input and output routines.

A28. 'pack', 'symbol'

This package contains two more string handling routines.

\29. 'stepstr', 'steparr'

This package offers the facility to alter strings that are stored in arrays.

A30. This package is a revised version of AØ, standard functions, and should be used in preference to library AØ for the segmented system.

EXAMPLES

1. The input/output library is required to read arrays from paper tape in single elements using 'read', to vet them and write them in binary to magnetic tape.
library A1,A4,A7,A9;

2. The program to read and write binary arrays on magnetic tape with constant identifiers, with text output for failure would require the following.
library A3,A7,A8,A9,A15;

3.8.1 Table of Library contents in alphabetical order

LIBRARY PROCEDURE	LIBRARY WHERE TO BE FOUND	LIBRARY PROCEDURE	LIBRARY WHERE TO BE FOUND
abs	A0, A30	read	A4,A6,A16(sp),A17
arctan	A0, A30	readarray	A10,A24
breadarray	A24	readbinary	A8,A22
breadbinary	A22	readboolean	A4,A6,A16,A17
btc	A7,A26	rewind	A7,A26
bwritearray	A25	sbreadarray	A24
bwritebinary	A23	sbreadbinary	A22
charin	A13	sbwritearray	A25
charout	A13	sbwritebinary	A23
close	A1,A2,A3,A6,A17	sclose	A27
cos	A0, A30	sfind	A26
copytext	A14	sfread	A27
copy	A19,A20	sfwrite	A27
dataskip	A7,A26	sign	A0, A30
entier	A0, A30	sin	A0, A30
etw	A7,A26	sireadarray	A24
exp	A0, A30	sireadbinary	A22
find	A7	siwritearray	A25
format	A5,A6,A17,A21	siwritebinary	A23
formatstring	A21	skip	A8,A22
gap	A12	space	A12
inbasicsymbol	A13	sqrt	A0, A30
instring	A18, A20	sread	A27
interchange	A7, A26	sreadarray	A24
intext	A18, A20	sreadbinary	A22
ireadarray	A24	steparr	A29
ireadbinary	A22	stepstr	A29
iwritebinary	A23	swritearray	A25
iwritearray	A25	swritebinary	A23
ln	A0, A30	swrite	A27
newline	A12	symbol	A28
open	A1,A2,A3,A6,A17	tab	A12
outbasicsymbol	A13	transfer	A18, A20
output	A5,A6,A17,A21	write	A5,A6,A17,A21
outstring	A19, A20	writetext	A6,A15,A17
outtext	A19, A20	writeboolean	A5,A6,A17,A21
pack	A28	writearray	A11, A25
		writebinary	A9, A23

3.8.2 Table of Library Calls, with the restrictions that apply

LIB REQUEST	SIZE (WORDS)	CONTENTS	LIBRARY REQUESTS NOT ALLOWED WITH THIS REQUEST	LIBRARY REQUESTS NEC. WITH REQUEST	
				NON-SEG	SEGMENTED
A0	180	STD FUNCTIONS	A30	-	-
*A1	28	OPEN, CLOSE	A2,3,6,17	-	-
*A2	28	OPEN (INPUT), CLOSE	A1,3,6,17	-	-
A3	28	OPEN (OUTPUT), CLOSE	A1,2,6,17	-	-
A4	137	READ, READ BOOLEAN	A6,16,17	A1 or A2**	-
A5	483	OUTPUT PACKAGE	A6,17,21	A1 or A3	-
†A6	687	STD. I/O PACKAGE	A1,2,3,4,5,15,16,17,21	-	-
A7	283	STD M/T PACKAGE	A26	A1 or A3	-
A8	133	READ BINARY, SKIP	A22	A7	A7 or A26
A9	101	WRITE BINARY	A23	A7	A7 or A26
A10	182	READ ARRAY	A24	A1 and (A4 or A16)	A4 or A16
A11	96	WRITE ARRAY	A25	A5	A5
A12	80	STD EDITING PACKAGE	-	A1 or A3	-
A13	50	CHAR/B.SYMBOL PACK.	-	A1 or A3	-
A14	74	COPY TEXT	-	A1	-
A15	75	WRITE TEXT	A6,17	A1 or A3	-
A16	145	SPECIAL READ, READ BOOLEAN	A4,6,17	A1 or A2**	-
†A17	695	STD I/O PACKAGE WITH SPECIAL READ	A1,2,3,4,5,6,15,16,21,23	-	-

Notes

* A1, A2 areboth identical to A3 in the segmentation scheme

** In these cases if A10 is specified A1 MUST be used.

† These two packages are entirely self contained

A18–A30 cannot be used with the non-segmented version of KALGOL and WALGOL

LIB REQUEST	SIZE (WORDS)	CONTENTS	LIBRARY REQUESTS NOT ALLOWED WITH THIS REQUEST	LIBRARY REQUESTS NEC. WITH REQUEST	
				NON-SEG	SEGMENTED
A18	167	TEXT INPUT PACKAGE	A20,A19	Not allowed	-
A19	149	TEXT OUTPUT PACKAGE	A20,A18	Not allowed	-
A20	292	STD TEXT PACKAGE	A18,19	Not allowed	-
A21	551	O/P PACKAGE WITH FORMAT STRING	A5,6,17	Not allowed	-
A22	250	READ BINARY + DERIVS	A8	Not allowed	A7 or A26
A23	215	WRITE BINARY + DERIVS	A9	Not allowed	A7 or A26
A24	324	READ ARRAY + DERIVS	A10	Not allowed	A4 or A16
A25	258	WRITE ARRAY + DERIVS	A11	Not allowed	A5
A26	292	STD M/T PACKAGE + SFIND	A7	Not allowed	-
A27	833	FORMATTED I/O	-	Not allowed	-
A28	67	STRING MANIPULATION	-	Not allowed	-
A29	192	STRING ALTERATION	-	Not allowed	-
A30	131	NEW MORE ACCURATE STD FNS	A0	Not allowed	-

Notes

* A1,A2 are both identical to A3 in the segmentation scheme

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A18-A30 cannot be used with the non-segmented version of KALGOL and WALGOL