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DECUS NO.	8-375A
TITLE	3 PAGE FLOATING POINT PACKAGE
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SOURCE LANGUAGE	PAL-10, VERSION 141

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3 PAGE FLOATING POINT PACKAGE

DECUS Program Library Write-up DECUS No. 8-375A

This write-up describes a 3 Page Floating Point Package whose distinguishing characteristic is that in 3 words it packs 27 bits.

The 3 word format is as follows:

	SM EXCESS 200 EXPONENT MANTISSA
WORD 1	0 000000000 000
WORD 2	000000000000
WORD 3	000000000000

SM - SIGN OF MANTISSA. IF SM=1 then the # is CONSIDERED NEGATIVE; IF SM=0 then it is POSITIVE. The Mantissa is always in POSITIVE form, only the SIGN Bit indicates the sign. To negate a number, simply complement the sign bit.

Exponent - It is EXCESS 200, meaning the exponent is always 200 + the true binary exponent. For example, 2, which in floating point binary is the following $.10000 \times 2^2$ is stored as follows in excess 200 format:

WORD 1: 2024 (SM=0.)
WORD 2: 0000
WORD 3: 0000

FLOATING INSTRUCTIONS

INSTRUCTION	CODE	FUNCTION	TYPE
FGET	0XXX	(FAC)<——(EA)	MRI
FADD	1XXX	(FAC)<——(FAC)+(EA)	MRI
FSUB	2XXX	(FAC)<——(FAC)-(EA)	MRI
FMUL	2XXX	(FAC)<——(FAC)x(EA)	MRI
FDIV	4XXX	(FAC)<——(FAC)÷(EA)	MRI
FJMP	5XXX	FPC <—— EA	MRI
FPUT	7XXX	(EA) <——(FAC)	MRI

FEXT	ØØØØ	LEAVE INTERPRETOR
FNOR	6ØØØ	NORMALIZE FAC
FSKP	66ØØ	SKIP NEXT INST
FSNE	664Ø	SKIP NEXT IF (FAC)≠Ø
FSEQ	665Ø	SKIP NEXT IF (FAC)=Ø
FSGE	67ØØ	SKIP NEXT IF (FAC)≥Ø
FSLT	671Ø	SKIP NEXT IF (FAC)<Ø
FSGT	664Ø	SKIP NEXT IF (FAC>Ø
FSLE	675Ø	SKIP NEXT IF (FAC)≤Ø

NOTE:		
	FAC	-Floating AC
	(FAC)	-Contents of Floating AC.
	EA	-Effective Address
	(EA)	-Contents of effective address
	FPC	-Floating PC.

For core usage a listing should be referred to. In case of an error, the package HALTS. This can be fed by simply re-assigning the symbol ERROR to something more useful.

This package was written by Mark Bramhall, but arranged into a stand-alone package by Richard Rothman.

No floating I/O is contained in this package.

CORE USAGE	50-64, 5400-6177
ERROR LOCATION:	5525, 6046, 6064
	THESE CONTAIN HALTS. THEY CAN BE PATCHED TO SOMETHING ELSE, OR REASSEMBLED.
MEANING OF ERROR:	5525 - Exponent overflow
	6046 - Exponent underflow
	6064 - Division by Ø.