MEMORANDUM 4C-2/42

Date: 19th July 1973

From: Hans Potters

Subject: A.   Abolition of the hierarchy flag

           B.   Answer to 4C-1/38

A. The hierarchy flag

Although the extension of EXFOR proposed in Memo 4C-2/41 is not, strictly speaking, incompatible with the hierarchy flag, CCDN feels that more than one type of 11th-column flag may lead to confusion. This in any case complicates the life of compilers and should be avoided. Instead we propose flagging the entries in Dictionary 24, as shown in the appendix (note that the new code LVL-NUMB has been added).

1. Unflagged are :

   (a) all headings specifying dependent variables (DATA- and RATIO-family);

   (b) data headings specifying supplementary numeric information (STAND-,EN-NRM- and MISC-families);

   (c) the heading FLAG.

2. All other headings in Dictionary 24 are flagged (see table). Two classes of headings are distinguished :

   Class 1 headings always pertain to independent variables and have to occur in COMMON or in the independent-variable section of the DATA table.

   Class 2 headings can in most cases at least formally be looked upon as independent variables and will normally be handled as such. The compiler, however, is free to use these headings also in the dependent-variable section of the table (i.e. after the first unflagged item), in which case they will be interpreted as giving merely supplementary information.

- 1 -

TABLE

Family	Main var. flag	Ass. var. flag	Class
EN	A	B	)
EN-RES	C	D	)
E	E	F	) 1
ANG	G	H	)
F. Prod.	I	J*	)
TEMP	8	9	)
HL	6	7	)
J	4	5*	) 2
L	2	3*	)
Parity	0	1*	)

* No headings exist; flags introduced for consistency reasons.

With the rather natural additional rule that members of the same data heading family should be grouped together in COMMON and DATA, this scheme allows automatic determination of hierarchy levels and monotony checks :

(a) We define an independent-variable group as a group of variables belonging to the same data heading family;

(b) The highest hierarchy levels are assigned to the families in COMMON in the order in which they occur;

(c) Subsequent hierarchy levels are assigned to the other families in the DATA section, again in the order in which they occur (maybe only these hierarchies are really necessary);

(d) The first column of the data table is always interpreted as an independent variable, whatever the heading might be.

(e) Search for independent-variable groups in DATA is stopped as soon as the first unflagged data heading keyword is encountered;

(f) Associated variables are exempted from monotony checking.

If any centre feels this is necessary, we might consider the possibility of preventing certain columns from being interpreted as independent variables by putting an '=' sign in the 11th column of the heading. We have in mind cases of over-determined independent variable groups such as EN in EV and in ANGSTROM, Q-VAL and E-EXC or E, E-LVL-INI and E-LVL-FIN. However, the CCDN does not feel this to be of necessity.

B. Memo 4C-1/38

We appreciate the proposals made in Memo 4C-1/38 and in Vicki May's letter of 21st June. We tried to include the essential features in Memo 4C-2/41 by (a) a slight but important generalization of the Moscow-Vienna proposal, and (b) simplification and unification of the different and conflicting 11th-column flag concepts in various proposals. The coding of two-dimensional transposable* tables with one ISO-QUANT fits naturally into the scheme.

1. to 3. See Memo 4C-2/41.

4. Blanks and zeros can be distinguished on input with the help e.g. of the T-format item in FORTRAN. We think this is an internal problem of each centre. Users with primitive FORTRAN-II compilers (without T-format item) can, on request, be provided with a special output format with special numbers instead of blanks.

5. See Memo 4C-2/41.

6. CCDN believes that the proposal made in the present memo (Section A) makes this number superfluous. The less explicit book-keeping information to be added the better.
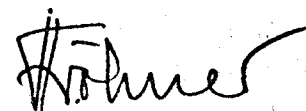
We hope that the proposals made in 4C-2/41 and in this memo will satisfy everyone - the simple, the general and the sophisticated.

P.S. In Memo 4C-2/41 instead of ANGLE read ANG.

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* I.e. tables where either one of the two independent variables can be put in COMMON and the other in DATA (counter-example cf. Memo 4C-2/41, Example 1).

Distribution

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APPENDIX

	24 730122 DATA-HEADING KEYWORDS		300
DICTION			300
EN	INCIDENT NEUTRON ENERGY, LAB-SYSTEM	A	300
EN-CM	INCIDENT NEUTRON ENERGY, C-M-SYSTEM	A	300
EN-MIN	LOW LIMIT OF INCIDENT N-ENERGY RANGE, LAB-SYSTEM	A	300
EN-CM-MIN	LOW LIMIT CF INCIDENT N-ENERGY RANGE, C-M-SYSTEM	A	300
EN-MAX	HIGH LIMIT OF INCIDENT N-ENERGY RANGE, LAB-SYSTEM	A	300
EN-CM-MAX	HIGH LIMIT CF INCIDENT N-ENERGY RANGE, C-M-SYSTEM	A	300
EN-DUMMY	DUMMY ENERGY. USED AS THE NUMERICAL EQUIVALENT		300
	OF AN INCIDENT NEUTRON SPECTRUM WHERE NO NUMERICAL		300
	ENERGY VALUE IS GIVEN BY THE AUTHOR		300
EN-RSL	INCIDENT-NEUTRON ENERGY-RESOLUTION	B	300
+EN-RSL	+UNSYMMETRIC ENERGY RESOLUTION	B	300
-EN-RSL	-UNSYMMETRIC ENERGY RESOLUTION	B	300
EN-ERR	ERROR OF MONOCHROMATIC INCIDENT-NEUTRON ENERGY OR	B	300
	UNCERTAINTY OF THE CENTRAL ENERGY IN AN INCIDENT		300
	NEUTRON-SPECTRUM.		300
EN-ERR1	ENERGY ERROR, IF MORE THAN ONE ERROR IS GIVEN.	B	300
	EXPLANATION UNDER 'ERR-ANALYS'.		300
EN-ERR2	SECOND ENERGY ERROR, IF MORE THAN ONE ERROR IS GIVEN.	B	300
	EXPLANATION UNDER 'ERR-ANALYS'		300
+EN-ERR	+ UNSYMMETRIC ENERGY-ERROR	B	300
-EN-ERR	- UNSYMMETRIC ENERGY-ERROR	B	300
EN-NRM	NORMALIZATION ENERGY. TO BE USED WHEN A DATA SET IS		300
	NORMALIZED TO ONE ENERGY ONLY.		300
EN-RES	RESONANCE ENERGY	C	300
EN-RES-ERR	ERROR OF RESONANCE-ENERGY	D	300
MU-ADLER	MU IN ADLER-ADLER RESONANCE-ANALYSIS, EQUIVALENT TO	C	300
	RESONANCE ENERGY		300
E	ENERGY OF OUTGOING PARTICLE, LAB-SYSTEM	E	300
E-CM	ENERGY OF OUTGOING PARTICLE, C-M-SYSTEM	E	300
E-MIN	LOW LIMIT OF OUTGOING-PARTICLE E-RANGE, LAB-SYSTEM	E	300
E-CM-MIN	LOW LIMIT OF OUTGOING-PARTICLE E-RANGE, C-M-SYSTEM	E	300
E-MAX	HIGH LIMIT OF OUTGOING-PARTICLE E-RANGE, LAB-SYSTEM	E	300
E-CM-MAX	HIGH LIMIT OF OUTGOING-PARTICLE E-RANGE, C-M-SYSTEM	F	300
E-RSL	OUTGOING-PARTICLE ENERGY-RESOLUTION	F	300
E-ERR	OUTGOING-PARTICLE ENERGY-ERROR	E	300
E-EXC	EXCITATION-ENERGY	E	300
E-EXC-MIN	LOW LIMIT OF EXCITATION-ENERGY	E	300
E-EXC-MAX	HIGH LIMIT CF EXCITATION-ENERGY	E	300
E-LVL	LEVEL-ENERGY	E	300
E-LVL-INI	INITIAL LEVEL OF GAMMA-TRANSITION	E	300
E-LVL-FIN	FINAL LEVEL OF GAMMA-TRANSITION	E	300

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Keyword	Description	Code
LVL-NUMB	LEVEL-NUMBER (To be used only if other information not available). E	
E-LVL-ERR	LEVEL-ENERGY ERROR	F30000024
E-LVL-MIN	LOW ENERGY-LIMIT OF A DISCRETE LEVEL-GROUP	E30000024
E-LVL-MAX	HIGH ENERGY-LIMIT OF A DISCRETE LEVEL-GROUP	E30000024
Q-VAL	Q-VALUE	E30000024
Q-VAL-ERR	Q-VALUE ERROR	F30000024
Q-VAL-MIN	LOWER LIMIT OF Q-VALUE	E30000024
Q-VAL-MAX	UPPER LIMIT OF Q-VALUE	E30000024
E-GAIN	GAIN IN NEUTRON ENERGY	E30000024
E-GAIN-ERR	ERROR OF GAIN IN NEUTRON ENERGY	F30000024
E-DGD	DEGREDATION IN NEUTRON ENERGY	E30000024
E-DGD-ERR	ERROR OF DEGREDATION IN NEUTRON ENERGY	F30000024
LINE DELETED		
LINE DELETED		
ANG	ANGLE, LAB-SYSTEM	G*30000024
ANG1	ANGLE, DEFINITION SPECIFIED IN THE BIB-SECTION	G*30000024
ANG2	ANGLE, DEFINITION SPECIFIED IN THE BIB-SECTION	G*30000024
ANG3	ANGLE, DEFINITION SPECIFIED IN THE BIB-SECTION	G*30000024
ANG-CM	ANGLE, C-M-SYSTEM	G*30000024
ANG-MIN	LOW LIMIT OF ANGLE RANGE, LAB-SYSTEM	G*30000024
ANG-CM-MIN	LOW LIMIT OF ANGLE RANGE, C-M-SYSTEM	G*30000024
ANG-MAX	HIGH LIMIT OF ANGLE RANGE, LAB-SYSTEM	G*30000024
ANG-CM-MAX	HIGH LIMIT OF ANGLE RANGE, C-M-SYSTEM	G*30000024
ANG-RSL	ANGULAR RESOLUTION	H30000024
ANG-ERR	ANGLE-ERROR	H30000024
COS	COSINE OF ANGLE, LAB-SYSTEM	G*30000024
COS-CM	COSINE OF ANGLE, C-M-SYSTEM	G*30000024
COS-MIN	LOW LIMIT OF COSINE-RANGE OF ANGLE, LAB-SYSTEM	G*30000024
COS-CM-MIN	LOW LIMIT OF COSINE-RANGE OF ANGLE, C-M-SYSTEM	G*30000024
COS-MAX	HIGH LIMIT OF COSINE-RANGE OF ANGLE, LAB-SYSTEM	G*30000024
COS-CM-MAX	HIGH LIMIT OF COSINE-RANGE OF ANGLE, C-M-SYSTEM	G*30000024
COS-RSL	COSINE OF ANGULAR RESOLUTION	H30000024
COS-ERR	COSINE OF ANGLE-ERROR	H30000024
DATA	HEADING FOR COLUMN GIVING THE QUANTITY SPECIFIED UNDER 'ISO-QUANT'	30000024
DATA-CM	DATA GIVEN IN THE CENTRE OF MASS SYSTEM	30000024
DATA-APRX	APPROXIMATE VALUE OF DATUM	30000024
DATA-MIN	LOW LIMIT OF DATUM	30000024
DATA-MAX	HIGH LIMIT OF DATUM	30000024
DATA-ERR	DATA-ERROR. EXPLANATION TO BE GIVEN UNDER 'ERR-ANALYS'	30000024
DATA-ERR1	FIRST DATA-ERROR, IF MORE THAN ONE ERROR-COL IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'	30000024
DATA-ERR2	SECOND DATA-ERROR, IF MORE THAN ONE ERROR-COL IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'	30000024
+DATA-ERR	+ UNSYMMETRIC DATA-ERROR. EXPLANATN UNDER 'ERR-ANALYS'	30000024
DATA-ERR3	THIRD DATA-ERROR, IF MORE THAN ONE ERROR-COL IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'	30000024
-DATA-ERR	- UNSYMMETRIC DATA-ERROR. EXPLANATN UNDER 'ERR-ANALYS'	30000024
RATIO	HEADING FOR COLUMN GIVING THE RATIO SPECIFIED UNDER 'ISO-QUANT', OR THE QUANTITY/STANDARD RATIO	30000024
RATIO-MIN	LOW LIMIT OF RATIO	30000024
RATIO-MAX	HIGH LIMIT OF RATIO	30000024
RATIO-ERR	RATIO-ERROR	30000024
RATIO-ERR1	FIRST RATIO-ERROR, IF MORE THAN ONE RATIO-ERROR IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'	30000024
RATIO-ERR2	SECOND RATIO-ERROR, IF MORE THAN ONE RATIO-ERROR IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'	30000024

+RATIO-ERR	+UNSYMMETRIC RATIO-ERROR. EXPLANATN UNDER 'ERR-ANALYS'	3000
-RATIO-ERR	-UNSYMMETRIC RATIO-ERROR. EXPLANATN UNDER 'ERR-ANALYS'	3000
STAND	HEADING FOR COLUMN GIVING THE NUMERICAL VALUE ASSUMED	3000
	FOR THE ISO-QUANT SPECIFIED UNDER 'STANDARD'	3000
STAND-ERR	STANDARD-ERROR	3000
STAND1	FIRST STANDARD-VALUE IF MORE THAN ONE IS GIVEN.	3000
	EXPLANATION UNDER 'STANDARD'	3000
STAND2	SECOND STANDARD-VALUE IF MORE THAN ONE IS GIVEN.	3000
	EXPLANATION UNDER 'STANDARD'	3000
STAND1-ERR	ERROR OF FIRST STANDARD-VALUE	3000
STAND2-ERR	ERROR OF SECOND STANDARD-VALUE	3000
TEMP	SAMPLE TEMPERATURE	3000
TEMP-ERR	ERROR OF SAMPLE TEMPERATURE	3000
ELEMENT	Z-NUMBER OF ELEMENTS, FOR FISSION-PRODUCT YIELDS ONLY!	3000
MASS	A-NUMBER OF ISOTOPES, FOR FISSION-PRODUCT YIELDS ONLY!	3000
HL	HALF-LIFE OF RESIDUAL NUCLEUS	3000
HL1	HALF-LIFE OF NUCLEUS SPECIFIED IN THE BIB-SECTION	3000
HL2	HALF-LIFE OF NUCLEUS SPECIFIED IN THE BIB-SECTION	3000
HL3	HALF-LIFE OF NUCLEUS SPECIFIED IN THE BIB-SECTION	3000
HL-ERR	ERROR OF HALF-LIFE OF RESIDUAL NUCLEUS	3000
HL1-ERR	ERROR OF HALF-LIFE OF NUCLEUS SPECIFIED IN BIB-SECTION	3000
HL2-ERR	ERROR OF HALF-LIFE OF NUCLEUS SPECIFIED IN BIB-SECTION	3000
HL3-ERR	ERROR OF HALF-LIFE OF NUCLEUS SPECIFIED IN BIB-SECTION	3000
FLAG	FLAG. MEANING OF FLAGS GIVEN UNDER THIS HEADING TO BE	3000
	EXPLAINED IN BIB-SECTION UNDER 'FLAG'	3000
NUMBER	NUMBER. USED TO SPECIFY INDICES, E.G. COEFF-NUMBERS.	3000
	LINE DELETED	
NUMBER-CM	COEFFICIENT-NUMBER OF LEGENDRE OR COSINE COEFFICIENTS	3000
	WHEN THE FIT HAS BEEN DEDUCED FROM AN ANGULAR	3000
	DISTRIBUTION IN WHICH THE ENERGIES ARE GIVEN IN THE	3000
	CENTRE OF MASS SYSTEM	3000
SPIN J	SPIN J OF RESONANCES, STRENGTH-FUNCTIONS, ETC.	3000
MOMENTUM L	ANGULAR MOMENTUM L OF RESONANCES, STRENGTH-F'S, ETC.	3000
PARITY	PARITY OF RESONANCE	3000
STAT-W G	STATISTICAL-WEIGHT FACTOR G	3000
MISC	HEADING FOR A COLUMN WITH SUPPLEMENTARY INFORMATION	3000
	FOR WHICH NO DATA-HEADING KEYWORD HAS BEEN DEFINED.	3000
	EXPLANATION TO BE GIVEN UNDER 'MISC-COL' KEYWORD	3000
MISC1	FIRST MISCELLANEOUS COLUMN - IF MORE THAN ONE IS GIVEN	3000
	SAME USAGE AS -MISC-(SEE ABOVE)	3000
MISC2	SECOND MISCELLANEOUS COLUMN -IF MORE THAN ONE IS GIVEN	3000
	SAME USAGE AS -MISC-(SEE ABOVE)	3000