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NELSON RESEARCH LABORATORIES
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MATHEMATICAL PHYSICS LABORATORY.

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Report No. NS t 34
Date 1.7.55
Reference
Order No.

Front Sheet.

Data Sheets 1.

Drawing Nos. S6/10104.

DEUCE Subroutine No. 43 (F02)

Report by
Miss J.M. Lloyd.

SUMMARY.

The attached document gives details of a DEUCE Subroutine for finding the square root of a double length number.

The subroutine has been prepared and tested in all D.L.'s at N.P.L.

J.M. LLOYD.

MATHEMATICAL PHYSICS LABORATORY.

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Description. First Order Subroutine giving $\sqrt{a}$ to the nearest odd digit where a is a number initially in D.S.21.

Data. a a positive double length number where $0 \leq a \leq 2^{62}$.

Result. $c = \sqrt{a}$ to the nearest odd digit.

Instructions for Use.

Stores Used.	13	14	15	21
Contents at Entry.	Link	-	-	a
Contents at Exit.	c	0	-	-

Occupies. m.c. 1-25, 28, 29, 31.

Entry. m.c. 4

Time. 17 m.s.

Constants Available. P_{30} in m.c. 18.
P_1 in m.c. 22.
P_{31} in m.c. 23.

Failure. 2, 7-24 if a is either negative or too large.

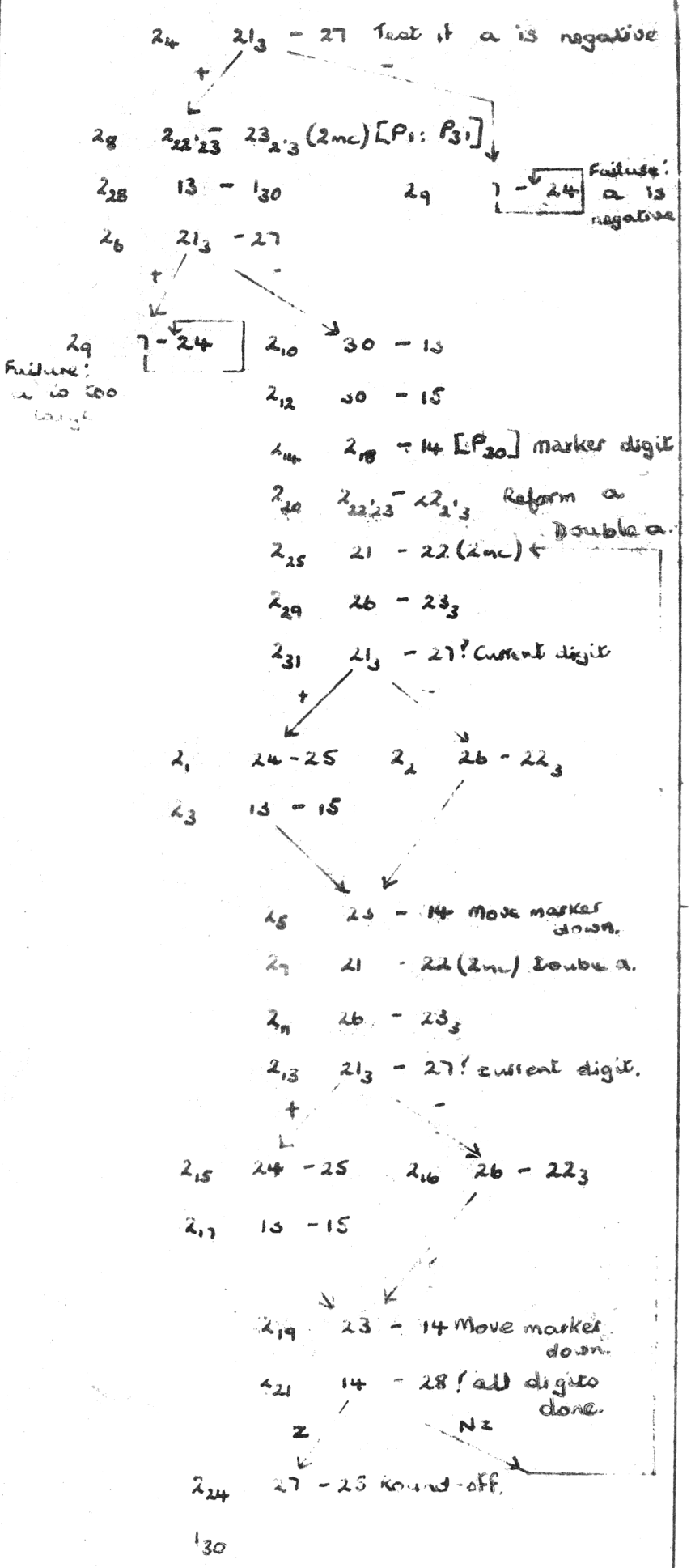
N.B. This version saves time by doing two digits per cycle; if space is more important 7 instructions may be saved by altering the time number in m.c. 29 to 14 but the time taken will then be 33 m.s.

(The instructions saved are those in m.c. 1, 2, 3, 5, 7, 11 and 31).

D.L. 2 Track

Card Nos.

mc	NIE	S	D	C	W	T		
								Y
								X
								0
								1
0								2
1	2	24	25		0	0		3
2	2	20	22		1	1		4
3	2	13	15		0	0		5
4	2	21	27		1	2		6
5	2	23	14		0	0		7
6	2	21	27		1	1		8
7	2	21	22	1	1	2		9
8	2	2	20	1	12	18		Y
9	2	1	24		0	00		X
10	2	30	13		0	0		0
11	2	26	23		0	0		1
12	2	30	15		0	0		2
13	2	21	27		0	0		3
14	2	2	14		2	4		4
15	2	24	25		0	0		5
16	2	26	22		1	1		6
17	2	13	15		0	0		7
18				P_{30}				8
19	2	23	14		0	0		9
20	2	2	22	1	0	3		Y
21	2	14	28		0	1		X
22				P_1				0
23				P_{31}				1
24	1	27	25		0	4		2
25	2	21	22	1	1	2		3
26								4
27								5
28	2	13	1		0	8		6
29	2	26	23		0	0		7
30								8
31	2	21	27		0	3		9



DOUBLE LENGTH SQUARE ROOT.

Date

File Ref. NRL/1

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