

# THE ENGLISH ELECTRIC CO., LTD.

NELSON RESEARCH LABORATORIES

STAFFORD

MATHEMATICAL PHYSICS LABORATORY.

Report No. NS t 60

Date 23.8.55.

Reference

Order No.

Telephone:—Stafford 700.

Front Sheet.  
Data Sheet 1.  
Figure sheet S6/10161

DEUCE Subroutine No. 67 (FO3D)

Report by

N.P.L.

SUMMARY.

The attached document contains details of a DEUCE Subroutine which has been prepared and tested by N.P.L.

*Albin*

MATHEMATICAL PHYSICS LABORATORY.

*W.S.*

NW

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NS t 60

Sheet No.: 1.

Description. Square root of double-length number giving double length answer.  
First Order.

Data. a ( $a \leq 2^{62}$  if considered as an integer).

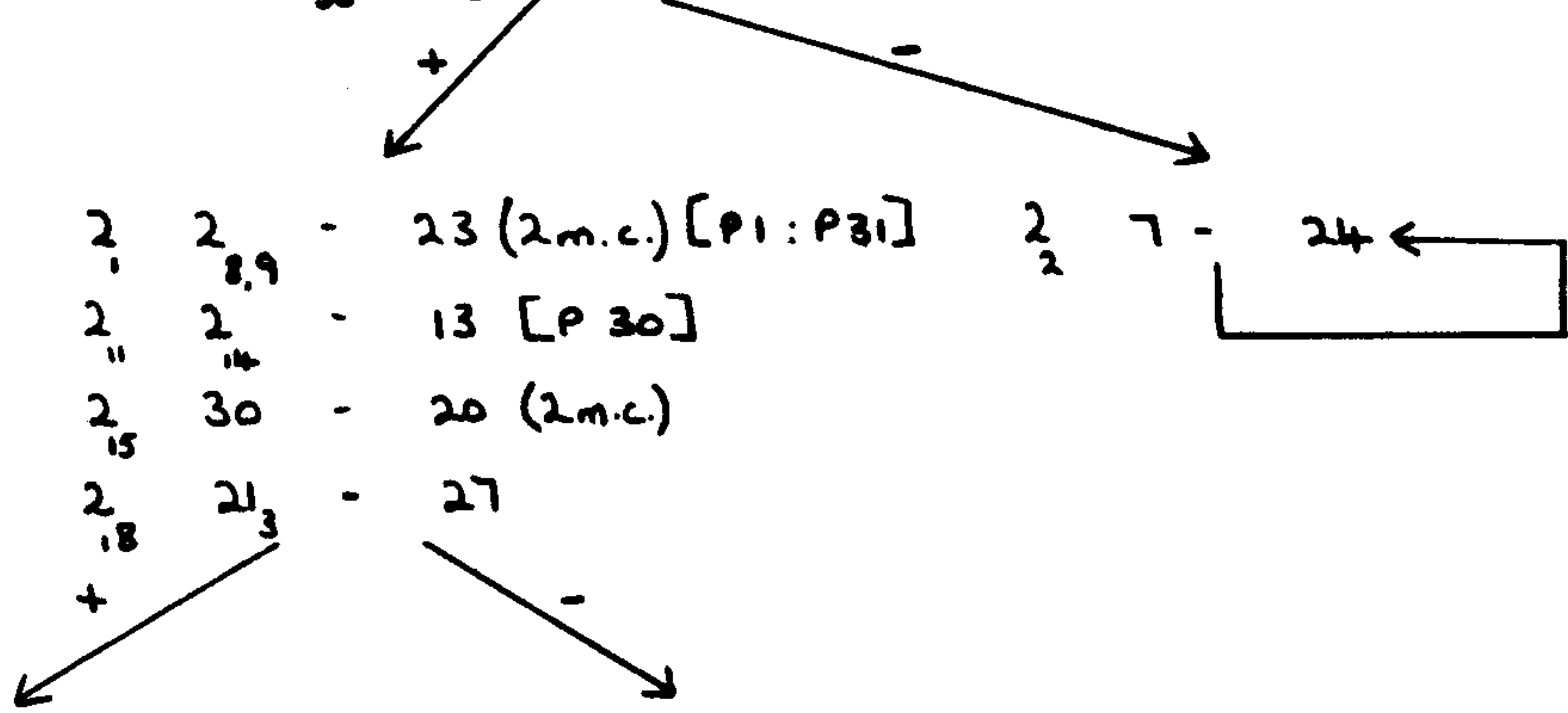
Result. c =  $2^{32} \sqrt{a}$  to nearest odd digit. (c is double length).  
(If a has p binary places, c has  $32 + P/2$  b.p.)

Instructions for Use.

Stores used.	13	14	20	21
Contents at Entry.	Link	-	-	a
Contents at Exit.	-	zero	o	-
Entry.	m.c. 28			
Occupies.	$2_{0-31}$ $3_{0-3}$			
Time.	65 m.s.			
Constants available.	P <sub>1</sub> in 2 <sub>8</sub> P <sub>31</sub> in 2 <sub>9</sub> P <sub>30</sub> in 2 <sub>14</sub>			
Failure.	2 7-24) if a is negative or too large.			

D.L. 2							D.L. 3							
Track							Track							
Card Nos.							Card Nos.							
mc	NIS	S	D	C	W	T	mc	NIS	S	D	C	W	T	
														Y
														X
														0
														1
0	3	14	26		0	0	0	3	13	20		1		2
1	2	2	23	d	5	8	1	2	13	28		0	1	3
2	2	7	24		0	30	2	2	20	22	d	0	1	4
3	2	13	14		0	1	3	2	30	13		0	0	5
4	2	20	13		1	6	4							6
5	2	23	14		0	0	5							7
6	2	2	22	d	0	2	6							8
7	2	14	25		0	1	7							9
8			P1				8							Y
9			P31				9							X
10	2	21	22	d	0	1	10							0
11	2	2	13		1	2	11							1
12	3	27	25		0	18	12							2
13	2	20	28		1	1	13							3
14			P30				14							4
15	2	30	20	d	0	1	15							5
16	2	13	20		1	3	16							6
17	2	14	27		0	0	17							7
18	2	21	27		1	14	18							8
19	2	14	28		0	2	19							9
20	2	29	25		0	0	20							Y
21	2	14	28		0	2	21							X
22	2	13	14		0	0	22							0
23	2	27	25		0	2	23							1
24	2	13	20		0	0	24							2
25	2	29	13		0	27	25							3
26	2	20	23	d	0	1	26							4
27	1	13	20		1	1	27							5
28	2	13	1		0	0	28							6
29	2	21	27		0	0	29							7
30	2	21	27		1	1	30							8
31	3	14	25		0	0	31							9

$$\begin{array}{r} 2_{28} \quad 13 - 1_{30} \\ 2_{30} \quad 21_3 - 27 \end{array}$$



$$2_2 \quad 7 - 24$$

$$\begin{array}{r} 2_3 \quad 13 - 14 \\ 2_6 \quad 2_{8,9} - 22 \text{ (2 m.c.)} \\ 2_{10} \quad 21 - 22 \text{ (2 m.c.)} \\ 2_{13} \quad 20_2 - 28 \end{array}$$

$$\begin{array}{r} 2_{16} \quad 13 - 20_3 \\ 2_{21} \quad 14 - 28 \end{array}$$

$$2_{17} \quad 14 - 27$$

$$\begin{array}{r} 2_{25} \quad 29 - 13 \\ 2_{22} \quad 13 - 14 \\ 2_{24} \quad 13 - 20_2 \\ 2_{26} \quad 20 - 23 \text{ (2 m.c.)} \\ 2_{29} \quad 21_3 - 27 \end{array}$$

$$2_{20} \quad 29 - 25$$

$$2_{19} \quad 14 - 28$$

$$\begin{array}{r} 2_{23} \quad 27 - 25 \\ 2_{27} \quad 13 - 20_2 \\ 1_{30} \end{array}$$

$$\begin{array}{r} 2_{31} \quad 14 - 25 \\ 3_1 \quad 13 - 28 \end{array}$$

$$\begin{array}{r} 2_0 \quad 14 - 26 \\ 3_2 \quad 20 - 22 \text{ (2 m.c.)} \end{array}$$

$$\begin{array}{r} 2_4 \quad 20_3 - 13 \\ 2_{12} \quad 27 - 25 \\ 3_0 \quad 13 - 20_3 \\ 3_3 \quad 30 - 13 \end{array}$$

$$\begin{array}{r} 2_5 \quad 23 - 14 \\ 2_7 \quad 14 - 25 \end{array}$$

