S.R.43

THE ENGLISH ELECTRIC CO., LTD.

NELSON RESEARCH LABORATORIES
STAFFORD
MATHEMATICAL PHYSICS LABORATORY.

Telephone:—Stafford 700.

Report No. NS t 39
Date 30.11.55.
Reference
Order No.

Front Sheet.
Data Sheet 1
Figure sheets S6/10331 and S6/10355

DEUCE Subroutine No. 108 (R03/1).

Report by
S.J.M.Denison.

SUMMARY.

The attached document contains details of a subroutine for reading and scaling three 9-digit decimal numbers from a card. It has been prepared, tested and copied into all instruction delay lines at N.R.L. Blackheath.

S.J.M. Denison

MATHEMATICAL PHYSICS LABORATORY.

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NELSON RESEARCH LABORATORIES
STAFFORD E. E. CO. LTD.

NS t 99
Sheet No.: 1.

Description. Reads three 9-digit decimal numbers from a card, converts them to binary and multiplies them by a given scaling factor. i.e. will convert from a specified No. of decimal places to a specified No. of binary places.
First order.

Data. a,b,c, signed 9-digit decimal numbers with D decimal places, punched with signs in cols. 1, 11, 21 and digits in columns 2-10, 12-20 and 22-30.

Result. ka, kb, kc in binary (or a,b,c, to p binary places).

Failure. 9-24↻ Card not decimally punched.

Error. $\pm \frac{1}{2}$ P.1.

Useful scaling factors.

D	p	$10^{-D}.2^{p+30}$
0	0	P31
1	4	6, 19, 25, 12, 6, 19, 1
2	7	31, 8, 1, 23, 30, 8, 1
3	10	12, 26, 13, 18, 24, 0, 1
4	14	12, 29, 2, 23, 13, 20, 1
5	17	4, 17, 21, 5, 30, 9, 1
6	20	3, 20, 23, 23, 17, 1, 1
7	24	11, 19, 18, 31, 21, 21, 1
8	27	9, 28, 14, 12, 30, 10, 1
9	30	1, 29, 11, 16, 11, 2, 1
10	34	7, 27, 31, 6, 31, 22, 1

Uses. 0 13-0 0 0 in 1_{28}

Time:- $1\frac{1}{3}$ m.s. before Y-row single shot.
$18\frac{1}{2}$ m.s(max) after 9-row single shot

Instructions for Use.

Stores Used.	13	14	15	16	19	20	21_2	21_3	$3_{0,1,2}$
Contents at Entry.	Link	-	-	-	-	-	-	-	-
Contents at Entry.	ka	kb	kc	|c|	$65P_{17}$	-	0	|kc|	ka,kb,kc

Occupies. D.L. 2, 3_{0-29}, 4_{6-31} + 4_2 and $4_{..}$ (. instructions more than RO3)

Entry. 4_{21}

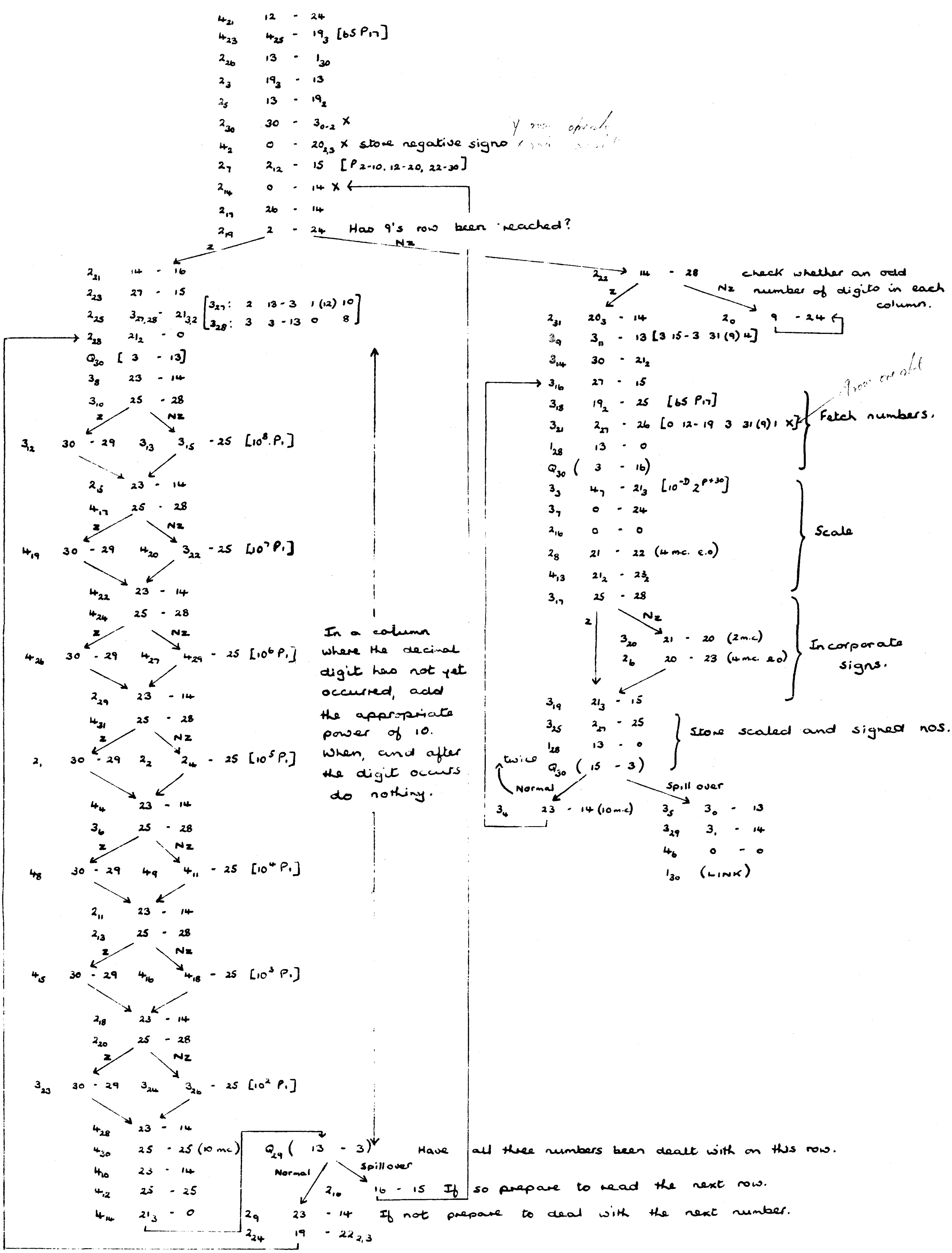
Parameter. k 10^{-D} 2^{30} in 4_7 (k = 2^p to produce a,b,&c to p binary places)

Constants etc. available.
21-0 1 0 13 in 4_{14}
21-0 0 0 in 2_{28}
P_{2-10}, P_{12-20}, P_{22-30} in 2_{12}
65 P_{17} in 4_{25}

in:-	3_{26}	4_{18}	4_{11}	2_4	4_{29}	3_{22}	3_{15}	
are:-	10^2	10^3	10^4	10^5	10^6	10^7	10^8	x P.1.

Waste instruction. 1 0-0 0 22 in 4_6

NOTE. Read is not cleared in the subroutine, but the waste instruction may be used for this.



N RESEARCH LABORATORIES, ENGLISH ELECTRIC CO. LTD, STAFFORD, ENGLAND.	FLOW DIAGRAM FOR SUBROUTINE NO 108 (R03/1) Read and scale 3, 9-digit numbers	Date File Ref. E.E. Sheet Ref. 56/10331

THE ENGLISH ELECTRIC CO. LTD. Sheet No. [illegible]

Deuce Programme

CODING FOR SUBROUTINE No. 108 (R03/1)

Read and scale, three 9-digit numbers.

D. L. 2 Track

Card Nos.

mc	NIS	S	D	C	W	T	
0	2	9	24		0	30	
1	4	30	29		0	1	
2	4	2	25		0	0	
3	2	19	13		0	0	
4		$10^5 P_1$					
5	2	13	19		1	23	
6	3	20	23	1	8	11	
7	2	2	15		3	5	
8	4	21	22	1	0	3	
9	2	23	14		0	13	
10	2	16	15		0	2	
11	2	23	14		0	0	
12		$P_{2-10,\ 12-20,\ 22-30}$					
13	4	25	28		0	0	
14	2	0	14		0	1	X
15	4	23	14		0	0	
16	2	0	0		23	22	
17	2	26	14		0	0	
18	2	23	14		0	0	
19	2	2	[illegible]		0	0	
20	3	25	28		0	1	
21	2	14	[illegible]		0	0	
22	2	14	28		0	7	
23	2	27	15		0	0	
24	2	19	22	2	0	2	
25	2	3	21	2	0	1	
26	2	13	1		2	7	
27		14-A- 17+A A to post of sub.					
	0	12	19	3	31 (9)	1	X
28	0	21	0		0	0	
29	4	23	14		0	0	
30	4	30	3	1	0	2	X
31	3	20	14		0	8	

D. L. 3 Track

Card Nos.

mc	NIS	S	D	C	W	T	
0							
1		RESERVED					
2							
3	3	4	21		2	2	
4	3	23	14	1	1	10	
5	3	3	13		25	22	
6	4	25	28		0	0	
7	2	0	24		0	7	
8	3	23	14		0	0	
9	3	3	13		0	3	
10	3	25	28		0	0	
11	3	15	3		31 (9)	4	
12	2	30	29		0	1	
13	2	3	25		0	0	
14	3	30	21		0	0	
15		$10^8 P_1$					
16	3	27	15		0	0	
17	3	25	28		0	0	
18	3	19	25		0	1	
19	3	21	15		0	4	
20	2	2	20	2	14	16	
21	1	2	26		4	5	
22		$10^7 P_1$					
23	4	30	29		0	3	
24	4	3	25		0	2	
25	1	2	25		0	1	
26		$10^2 P_1$					
27	2	13	3		1 (10)	10	
28	3	3	13		0	8	
29	4	3	14		2	7	
30							
31							

D.L. 4 Track

Card Nos.

mc	NIS	S	D	C	W	T		
								Y
								X
								0
								1
0								2
1								3
2	2	0	20	2	0	3	X	4
3								5
4	3	23	14		0	0		6
5								7
6	1	0	0		0	22		8
7		$10^{-3} \cdot 2^{p+30}$						9
8	2	30	29		0	1		Y
9	2	4	25		0	0		X
10	4	23	14		0	0		0
11		$10^4 P_1$						1
12	4	25	25		0	0		2
13	3	21	23		1	2		3
14	0	21	0	1	0	3		4
15	2	30	29		0	1		5
16	2	4	25		0	0		6
17	4	25	28		0	0		7
18		$10^3 P_1$						8
19	4	30	29		0	1		9
20	4	3	25		0	0		Y
21	4	12	24		0	0		X
22	4	23	14		0	0		0
23	2	4	19		0	1		1
24	4	25	28		0	0		2
25		$65 P_{17}$						3
26	2	30	29		0	1		4
27	2	4	25		0	0		5
28	4	23	14		0	0		6
29		$10^6 P_1$						7
30	4	25	25	1	1	10		8
31	2	25	28		0	0		9