

THE ENGLISH ELECTRIC CO., LTD.

Tel. 700

NELSON RESEARCH LABORATORIES

STAFFORD

DEUCE SUBROUTINE No. 99 (E05)

Report No. NS t 90

Date 5.11.55

Reference

Order No.

Report by R.A.E.

Front Sheet.

Data Sheet 1.

Figure sheet S6/10315

SUMMARY.

The attached document contains details of a DEUCE Subroutine which has been prepared and tested by R.A.E.

A. Gilmour.

MATHEMATICAL PHYSICS LABORATORY.

NW

NELSON RESEARCH LABORATORIES
STAFFORD E. E. CO. LTD

NS t 90

Sheet No.: 1

Description. Third Order Subroutine, using an economised series to compute a log. to 30 b.p.

Data. x to 30 b.p.

Uses. SO6 (15) (DLB 0-9, 11, 18, 23, 26, ~~29-31~~)
M12 (14) (DLB 12-17, 19-22, 24, 25, 27).
Coeffs. a_r ($0 \leq r \leq 8$) stored in DLC m.c.'s t, t+1, ..., t+8

Result. $c = 2^{-4} \text{Log}_2 2^q x$ to 30 b.p.

Failure. 7 - 24 $\left\{ \begin{array}{l} \text{if } x < C, \text{ and loop of 3 instructions if } x = 0. \end{array} \right.$

Coefficients. in C_t to C_{t+8}

a_0	=	0				
a_1	=	13	11	7	10	5 14.1
a_2	=	11	28	30	10	29 8.3
a_3	=	16	9	0	12	12 15.0
a_4	=	9	9	9	16	15 20.3
a_5	=	30	23	6	7	1 9.0
a_6	=	7	9	8	31	5 25.3
a_7	=	28	14	11	18	3 4.0
a_8	=	20	31	21	16	20 30.3

Instructions for Use.

Stores Used. 13 14 15 16 21₃

Contents at Entry. - x - link -

Contents at Exit. 0 Mantissa 0 - c
30 b.p.

Occupies. m.c.'s 0-31 of D.L.A

Entry. m.c. 29

Parameters. D.L.A add BP_2 in m.c.'s. 16 and 25.
D.L.A add $q P_{27}$ in m.c. 5
D.L.A (add $C P_5 + t P_{17}$) in m.c. 10.
 BP_2 in Bq

Constants available. 2 to 30 b.p. in m.c. 28
1/2 to 30 b.p. in m.c. 13
 P_{27} in m.c. 27 of D.L.A
 P_{26} in m.c. 9
 P_{31} in m.c. 1
 $8P_{17}$ in m.c. 14

D.L. #		Track					
Card Nos.		1-3					
mc	vis	S	D	C	W	T	
						Y	
						X	
						0	
						1	
0	A	14	27	0	0	2	
1			P31			3	
2	A	A	21	1	13	4	
3	A	7	24	0	30	5	
4	A	21	16	1	2	6	
5			9.P27			7	
6	A	A	22	1	3	8	
7	A	14	21	0	21	9	
8	A	A	13	0	2	Y	
9			P26			X	
10			C.P5+t.P17			0	
11	A	A	16	0	2	1	
12	A	A	15	0	2	2	
13			13, 6, 15, 2, 20, 22			3	
14			8.P17			4	
15	A	21	A	6	8	5	
16	B	A	14	0	0	6	
17	A	24	27	0	0	7	
18	A	22	21	1	13	20	8
19	A	24	14	0	1	9	9
20	A	21	A	1	2	Y	20
21	A	A	22	0	9	X	21
22	A	A	23	3	25	0	22
23			Characteristic			1	23
24	A	14	13	0	0	2	24
25	B	A	13	3	17	3	25
26	A	A	26	0	3	4	26
27			P27			5	27
28			26, 12, 30, 14, 8, 13, 1			6	28
29	A	16	1	1	1	7	29
30	A	A	23	1	14	8	30
31	A	13	27	0	5	9	31

