Z.501/22

THE ENGLISH ELECTRIC CO., LTD.

NELSON RESEARCH LABORATORIES
STAFFORD
MATHEMATICS DEPARTMENT.

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Report No. NS t 216
Date 14. 4.58.
Reference
Order No.

Front Sheet.

Data Sheets 1.

Figure Sheet S6/11175.

	Report by
DEUCE Subroutine No. 242 (T05/3)	R.A.E.

SUMMARY.

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

R.A.Smith.

MATHEMATICS DEPARTMENT.

HEF

Description. This subroutine computes $2\theta/\pi$ to 30 b.p. if given $x = r \sin \theta$ and $z = r \cos \theta$. $r > 0$.
This subroutine is a simple modification of T05/2 (No. 140) to use A12/1, (No. 222) as sum series.

NOTE: Link is now in TS15 and routine is 2nd order.

Data. $r \sin \theta$ and $r \cos \theta$ to any number of b.p.

Uses. A12/1, No. 222 in D.L.A which requires 13-0 in 1_{28}.

Result. $2\theta/\pi$ to 30 b.p. Error not greater than $2P_1$.

Instructions for Use.

Stores Used.	13	14	15	16	19_2	19_3	21
Contents at Entry.	-	-	link	-	$r \cos \theta$	$r \sin \theta$	-
Contents at Exit.	$2\theta/\pi$	-	-	-	$r \cos \theta$	$r \sin \theta$	-

Occupies. D.L. $2_{0-27,\ 29-31}$, D.L.$3_{0-7,\ 10-29}$; but 3_5 and 3_6 are used as working space only.

Entry. 2_{11}

Time. $54\frac{1}{2}$ m.s. if $|x| \neq |z|$. $2\frac{1}{2}$ m.s. if $|x| = |z|$.

Parameters. N.I.S. A in $2_{4,\ 5,\ 6}$.

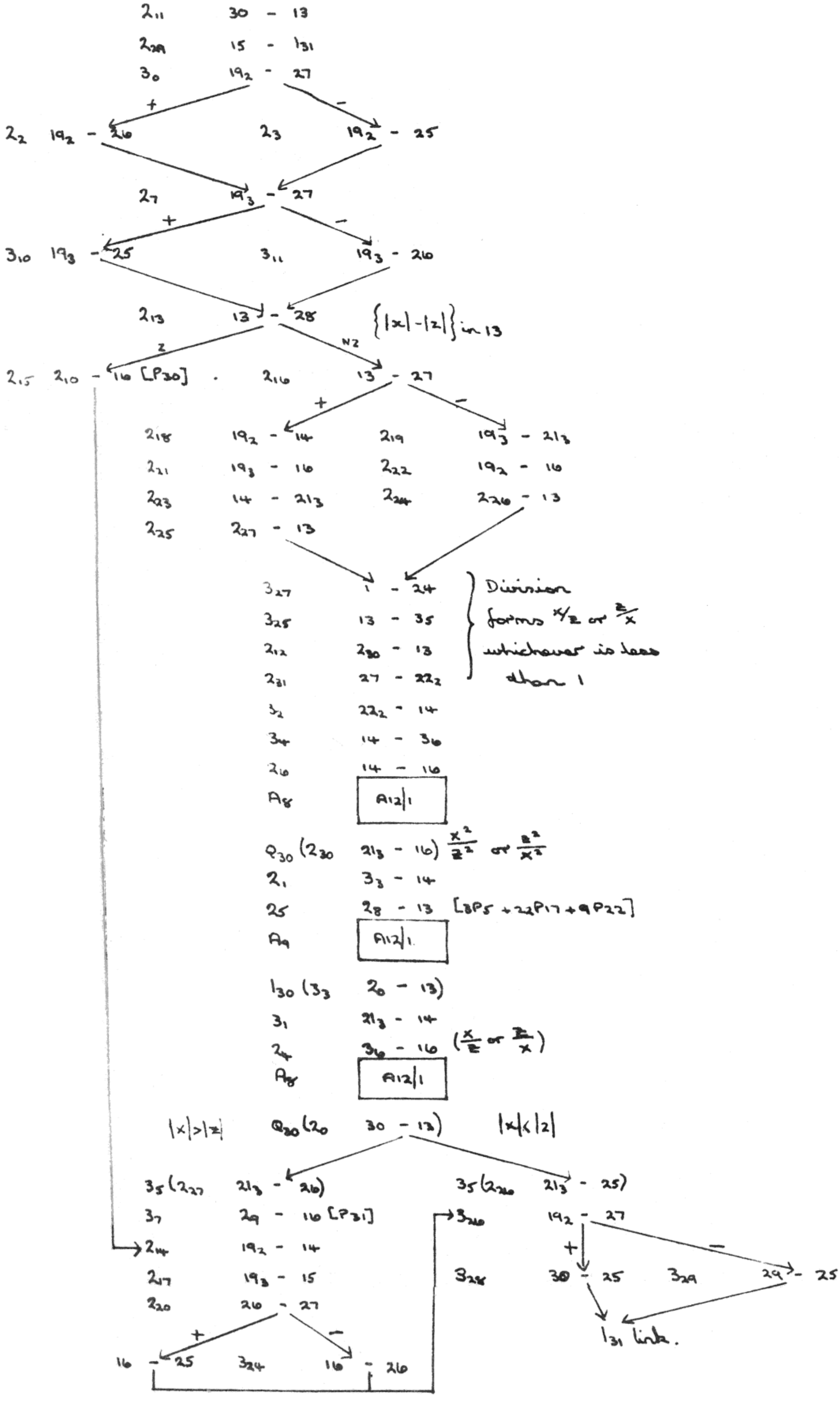
D. L. 2 Track

Card Nos. 1, 2, 3

D.L. 3 Track

Card Nos. 4, 5, 6

mc	NIS	S	D	C	W	T		mc	NIS	S	D	C	W	T		
																Y
																X
																0
																1
0	3	30	13		0	5		0	2	19	27		0	0		2
1	2	3	14		0	2		1	2	21	14		0	1		3
2	2	19	26		0	3		2	3	22	14		0	0		4
3	2	19	26		1	2		3	3	2	13		0	1		5
4	A	3	16		0	2		4	2	14	3		0	[illegible]		6
5	A	2	13		1	2		5		Used						7
6	A	14	16		0	0		6		Used						8
7	2	19	27		0	1		7	2	2	16		0	5		9
8		$3P_5 + 22P_{17} + 9P_{22}$						8								Y
9		P_{31}						9								X
10		P_{30}						10	2	19	25		1	1		0
11	2	30	13		0	16		11	2	19	26		0	0		1
12	2	2	13		16	17		12	27,	6, 24,		28,	11, 30, 0			2
13	2	13	28		0	0		13	10,	13, 13,		22,	6, 25, 3			3
14	2	19	14		0	1		14	31,	11, 30,		11,	2, 4, 0			4
15	2	2	16		25	29		15	24,	27, 24,		30,	2, [illegible], 3			5
16	2	13	27		0	0		16	29,	2, 25,		24,	7, 3, 0			6
17	2	19	15		0	1		17	25,	16, 16,		30,	7, 30, 3			7
18	2	19	14		0	1		18	24,	21, 21,		21,	2, 1, 0			8
19	2	19	21		0	1		19	9,	20, 31,		25,	[illegible], 31, 3			9
20	3	26	27		0	1		20	25,	23, 6,		12,	12, 0, 0			Y
21	2	19	16		0	0		21	22,	22, 23,		7,	28, 31, 3			X
22	2	19	16		0	0		22	6,	24, 5,		17,	0, 0, 0			0
23	2	14	21		0	0		23	3	16	25		0	1		1
24	3	2	13		0	1		24	3	16	26		0	0		2
25	3	2	13		0	0		25	2	13	3		10	17		3
26	3	21	25		0	19		26	3	19	27		0	0		4
27	3	21	26		0	0		27	3	1	24		0	28		5
28								28	1	30	25		0	1		6
29	3	15	1		0	1		29	1	29	25		0	0		7
30	2	21	16		1	1		30								8
31	3	27	22		1	1		31								9



DEUCE Subroutine No. 242 (T05/3)

Inverse Tangent.

NELSON RESEARCH LABORATORIES,
THE ENGLISH ELECTRIC CO. LTD.,
STAFFORD, ENGLAND.

Dr.
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