DEUCE Programme No. 261 (ZP29)

Post Mortem.

SUMMARY

This program punches the entire contents of the DEUCE store except for one mc in DL1 and track 15/14.

If this programme is used on G.I.P.$^{(1-6)}$ or Alphacode$^{(Mark\,I)}$ programmes the Source nos. in rows 1 and 9 of the front card of Post Mortem should be changed from 15 to 14 to get results punched in phase.

ZP29, ZP29/1 & ZP29T/2 (261, 467, 477)

These programmes do not produce results in correct phase in rare circumstances.

Card 6, 7-row

1, 11-14, 1, (15) 9 (1) Should be
1, 11-14 0 (15) 9 (1).

DEUCE Programme No. 261 (ZP29)

Post Mortem.

OPERATING INSTRUCTIONS. (Does not work on an 80 col. machine. Use ZP29/1 or ZP29T/2 Nos 467, 477)

Program Cards 0-18

Operating Details

Stop the computer.
Set 30-0(1) on instruction staticisor keys.
Depress external tree key.
One-shot.
Raise external tree key.
Unstop the computer.
Call read manually.
Run in the program (if the stop key is still at STOP the machine will stop at 10-24X and the stop key must then be raised). If the reader is switched incorrectly only one card of POST MORTEM will be read, and no information in the computer will be lost. POST MORTEM Cards are then punched (between reading various bits of program). can then be re-assembled and run in again.

Output

After punching a number up to 268 triads of cards the machine stops at 0-22X.
Selection of the required information is possible by raising the DISCRIM key. This can only be done after the first three cards have been punched. (These three are punched quite separately and cards are read between each). If the DISCRIM key is raised during the punching of DL's, no further DL's are punched and the machine stops at 0-22X. If it is raised during the punching of tracks the machine also stops at 0-22X. Whenever the machine stops at 0-22X, if TxP17 is put on the I.D. and the DISCRIM key put to normal punching will be resumed at track T after a one-shot.

While track S is being punched (S-1) P_{17} + P_{15} is in 2/2

Result

Triads of cards are punched indicating the complete state of the machine except for (a) Track 15/14
(b) The magnetic head positions
~~(c) One m.c. of DL1 (this is the m.c. of the instruction at which the machine is stopped~~

(a) TS Count

The first 3 cards include the contents of the short tanks in the same arrangement as they are shown on the monitor.

1st Card - X row ID
2 row TS13
4 row TS14
6 row TS15
8 row TS16; if TCA is on there are 1's on the 8 row and 9 row

2nd Card - Y-X rows DS19 (The DS's have correct parity).
2-3 rows DS20
6-7 rows DS21
8-9 rows 1's if TCB is on.

3rd Card - Y-1 rows QS17
6-9 rows QS18

There follow triads punched with the contents of any non-zero DL's starting at DL12; each has standard initial instructions.
DL1 is punched with initial instructions leading to the last mc which is replaced with 1, 9-24, 0, 30.
There follow triads punched with the contents of any non-zero tracks that are required except for 15/14; each has track number punched as for ZP14 (P15 + TxP17 on Y-row).
The QS's, DL's and tracks are punched in phase with one another though not necessarily with the DS's which always have correct parity. If 15/15 is a "P31 clock track" (i.e. $15/15_{16}$ is characterised by a P31) all punching is in correct phase. Otherwise the program punches in phase with itself.

c) One m.c. of D.L.I. (This is the m.c. of the instruction following that at which the computer is stopped in the programme under investigation, e.g. if the computer was stopped at 13-14 calling 65,15 would be lost.

d) (This is not what we do as the use of the word is the m.c. of the instruction following that at which the machine is stopped in the programme e.g. if the programme was stopped at 13-14 calling 65,1 would be lost).

January, 1957. NOTE An extra blank card may be produced after the machine has punched the contents of a non-zero track which is followed by a zero track.

D.L. 1 Track

Card Nos. 1 - 3

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

I_{31} cl Rd

I_{30} stim Punch

I_2 $10_{30,31}$ - 1 X

I_4 0 - 29 X

I_6 1's - 10_{30} X

I_8 0's - 10_{31} X

I_{10} 13 - 29 X

I_{12} 16_{31} - 13 X

I_{14} 14 - 29 X

I_{16} 21_2 - 14 X

I_{18} 15 - 29 X

I_{20} 16_0 - 26 X

I_{22} 16_{31} - 29X

I_{24} 13 - 29X

I_{26} cl. Punch

I_3 21_3 - 15

I_5 $I_{30,31}$ - 10

I_7 1's - $21_{2,3}$

I_{11} P1 - 22_{23}

I_{15} cl. 13

I_{17} $21_{2,3}$ - 25

I_{21} P1 - 26

I_{23} 1's - $21_{2,3}$.

I_{27} cl. T.C.B

I_{29} P1 - 22_2

Cardo.

Q_0 0 - 0 X dagaba Yaa

Q_2 0 - 0 X

Q_4 30 - I_0 X

Q_0 0 - 0 X

Q_2 15 - 31 (1) X

Q_0 0 - 0 X

Q_2 0 - 0 X

Q_0 0 - 0 X

Q_2 14 - 30 (1) X

Q_0 0 - 0 X

Q_2 1 - 11_{1-0} X

Q_0 0 - 0

Q_2 15 - 21 X

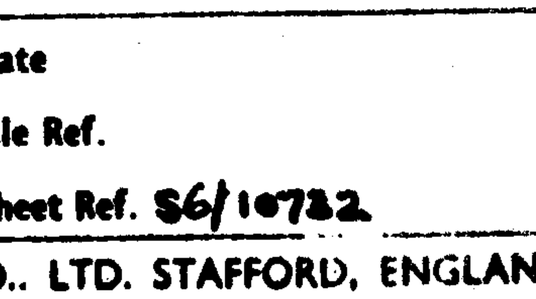
I_7 14 - 21_2

I_{13} 21_3 - 14

I_{17} 15 - 21_3

I_{25} St Rd.

I_{28} 14 - 28



FLOW DIAGRAM AND CODING FOR DEUCE PROGRAM No. 261 (21-28)

PUNCH ID, TS and TCA.

Date

File Ref.

Sheet Ref. S6/10782

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

D. L. 1 Track

Card Nos. ~~4~~ 6 4,5

CONTENTS OF D.L. 1 Track BEFORE PUNCHING D.S.'s.

Card Nos.

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

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

I_{11} cl Rd.

I_{13} st. PunchR

I_{30} 19_2 - 29 X

I_{31} 19_3 - 29 X

I_0 cP I_{31} X

I_1 cP I_0 X

I_2 20_1 - 29 X

I_3 20_3 - 29 X

I_4 1 - 1 X

I_5 1 - 1 X

I_6 21_1 - 29 X

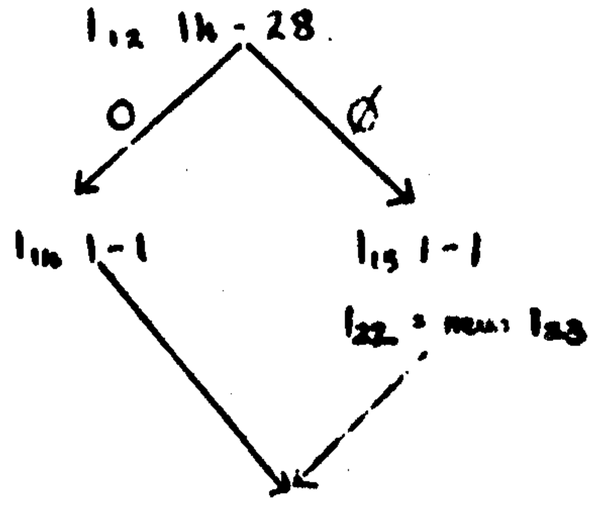
I_7 21_2 - 29 X

I_8 13 - 29 X

I_9 13 - 29 X

I_{10} cP PunchR.

I_{12} 14 - 28.



I_{23} 11_{25} - 16

I_{25} $11_{26,27}$ - 19.

I_{24} $11_{28,29}$ - 20

I_{29} $11_{30,31}$ - 21

I_{19} st Rd.

I_{21} 0 - 13 X

I.

T... DIAGRAM AND ... FOR ... PROG PM NO 261 (~029)

SHEET 4.

SHEET REF. S6/10733

PUNCH D...

D.L. 1 Track Card Nos. ~~5~~ 6,7							CONTENTS OF D.L. 1 Track Card Nos. AFTER READING CARD 6.							
mc	NIS	S D	C	W T			mc	NIS	S D	C	W T			
	1	11 - 14		0 (15) 9(1)										Y
	1	0 - 15		0 28	X									X
	3	1 x P 26												0
	1	0 - 1	1	14 - 20	X									1
0	1	0 - 11		5 29	X		0							2
1	1	1 - 11	1	0 31			1							3
2	1	28 - 24		0 26			2							4
3	0	13 - 0	1	0 15			3							5
4	1	15 - 30		0 31			4							6
5	1	24 - 27		0 0			5							7
6	1	13 - 11		20 4			6							8
7	1	28 - 25		0 0			7							9
8	1	0 - 1		22 28	X		8							Y
9	1	24 - 14	1	24 0			9							X
10	1	0 - 1		24 28	X		10							0
11	1	25 - 13		0 1			11							1
12	1	0 - 1		26 28	X		12							2
13	1	13 - 11	2	15 29			13							3
14	1	28 - 25		0 25			14							4
15	1	0 - 0		0 28			15							5
16	1	0 - 0		0 28			16							6
17	1	0 - 0		0 28			17	1	11 - 1	1	10 9			7
18	1	0 - 0		0 28			18							8
19	1	0 - 0		0 28			19							9
20							20							Y
21		CONTENTS OF DL1					21							X
22		AFTER READING					22							0
23		CARD Y.					23							1
24							24							2
25	1	28 - 25		01 0			25	1	28 - 25		0 0			3
	1	24 - 14	1	24 0			26	1	13 - 11		20 4			4
	1	24 - 27		0 0			27	1	24 - 27		0 0			5
	1	25 - 13		0 1			28	1	15 - 30		0 31			6
29	0	13 - 0	1	0 15			29	0	13 - 0	1	0 15			7
30	1	13 - 11	2	15 29			30	1	28 - 26		0 26			8
31		1 - 11		0 31			31	1	1 - 11	1	0 31			9

Q_2 0 - 15 X (11 - 14)

l_{17} 11 - 1 (32)

l_{28} 15 - 30

l_{29} 13 Y 0 m → m+1

Q_{14} [11m - 14]

~~17 m 14~~ 0 ≤ m ≤ M < 16

No P_{30}'s m = M = 15

l_{25} P17 - 25

l_{24} 24 - 27 P_{21} m = M < 16

l_{26} 13 - 11 (6)

l_0

leaves "11m - 14" as 11

l_{30} P17 - 2(

Q_2 "24 - 14 (9)" - l_{26}

Q_2 "25 - 13" - l_{28}

Q_2 "13 - $11_{m,16}$" - l_{30}

Q_2 P17 - 2(

l_{29} 13 - 0

Q_{14} [11m - 14]

m < m < 16 — N = 16 or m = 16 — "11_N - 14" as 11

l_{25} P17 - 25 l_{26} 24 - 14 (9 m)

l_{24} 24 - 27 l_{28} 25 - 13

l_{31} 1 - 11 (32 m)

l_0

Another P 31 M

l_{30} 13 - $11_{15,16}$

If there is another [illegible] then there will be another in 11.

Leaves 11 + 16 X P 26 or P 5. 13.

FLOW DIAGRAM AND CODING FOR DIRIGE PROGRAM NO. 2 [illegible] 26/10/54

SHEET 3

PHASE - FIND WITH "P 31 = CALCULATING"

D.L. 1 Track Card Nos. [redacted] 8,9							CONTENTS OF D.L. 1 Track BEFORE PUNCHING QS's. Card Nos.							
mc	NIB	S D	C	W T			mc	NIB	S D	C	W T			
	1	16 - 11		21 28										Y
	1	19 - 11	2	22 28										X
	1	20 - 11	2	24 28										0
	1	21 - 11	2	26 28										1
0	1	0 - 25		0 25	X		0	1	17 - 29		0 31	X		2
1	1	30 - 1	1	0 16			1	1	17 - 29		0 31	X		3
2	1	0 - 1	1	11 9	X		2	1	1 - 17		11 31	X		4
3	1	0 - 1	2	13 0	X		3	1	1 - 17		11 31	X		5
4	1	0 - 1	1	13 19	X		4	1	1 - 17		11 31	X		6
5	1	17 - 29		0 31	X		5	1	1 - 17		11 31	X		7
6	1	17 - 29		0 31	X		6	1	18 - 29		0 31	X		8
7	1	1 - 17		11 31	X		7	1	18 - 29		0 31	X		9
8	1	1 - 17		11 31	X		8	1	18 - 29		0 31	X		Y
9	1	18 - 29		0 31	X		9	1	18 - 29		0 31	X		X
10	1	18 - 29		0 31	X		10	1	9 - 24		0 0			0
11	1	9 - 24		0 0			11	1	9 - 24		0 0			1
12	1	0 - 1		30 29	X		12	1	12 - 24		16 0			2
13	0	0 - 8		27 28	X		13	1	10 - 24		0 15			3
14	0	0 - 13		30 31	X		14	1	30 - 1		16 16			4
15	1	0 - 8	1	29 28	X		15	1	0 - 13		30 31	X		5
16	1	0 - 13		30 31	X		16	1	0 - 8	1	29 28	X		6
17	1	30 - 1		16 16			17	0	0 - 13		30 31	X		7
18	1	10 - 14 24		0 15			18	0	0 - 8		27 28	X		8
19	1	12 - 24		0 0			19							9
20							20							Y
21							21							X
22							22							0
23							23							1
24							24							2
25							25							3
26							26							4
27							27							5
28							28	1	0 - 1	1	13 - 19	X		6
29							29	1	0 - 1	1	13 - 19	X		7
30							30	1	17 - 27		0 31	X		8
31							31	1	17 - 29		0 31	X		9

Q_1 $16 - 11_{25}$
Q_2 $19 - 11_{26,27}$
Q_3 $20 - 11_{28,29}$
Q_4 $21 - 11_{30,31}$
Q_5 $0 - 25X$ (1 row)
Q_{29} $13 - 0$
Q_{16} $[30 - 1(1)]$ M5
I_{M+16} - New I_0

I_{11} $9 - 24$
I_{13} $10 - 24$
I_{30} $17_0 - 29X$
I_{31} $17_1 - 29X$
I_0 $17_2 - 29X$
I_1 $17_3 - 29X$
I_2 $I_{15} - 17_3X$
I_3 $I_{16} - 17_0X$
I_4 $I_{17} - 17_1X$
I_5 $I_{18} - 17_2X$
I_6 $18_0 - 29X$
I_7 $18_1 - 29X$
I_8 $18_2 - 29X$
I_9 $18_3 - 29X$
I_{10} $9 - 24$
I_{12} $12 - 24$
I_{14} $30 - I_0$
I_0

leaves 1, 30-1(1) 0, M+16 (mod 32)
in TS 13

FLOW DIAGRAM AND CODING FOR [redacted] PROGRAM NO 261 (LPA7)

SHEET 4

SHEET REF. S6/10735

PUNCH QS's

D.L. 1 Track

Card Nos. ~~1 3 ~~ ~~1 5~~ 10

INC	NIS	S	D	C	W	T		
	1	0	-26		0	28	X	Y
	1	30	-0	1	0	16		X
	1	13	-16		0	28		0
	1	0	-15		0	28	^	1
0		-7	*P2+P10					2
1	1	30	-18		0	28		3
2	1	0	-18		1	28	X	4
3	1	31	-8	1	26	25	X	5
4	1	0	-18		2	28	X	6
5	1	31	-8		30	31	X	7
6	1	0	-18		3	28	X	8
7	1	0	-9		30	31	X	9
8								Y
9								X
10								0
11								1
12								2
13								3
14								4
15								5
16								6
17								7
18								8
19								9
20								Y
21								X
								0
								1
24								2
								3
								4
								5
								6
29								7
30								8
31								9

TS 13 has 1, 30-1(4) 0, M+16 (mod 32)+16

Q_2 0 - 26 X

Q_2 13 - 16

Q_2 '-7×P2+P10'-15 (0-row)

Q_2 30-18$_0$

Q_2 0 - 18$_1$ X

Q_2 0 - 18$_2$ X

Q_2 0 - 18$_3$ X

I_0 α_0

Leaves P10 + M + 16 (mod 32) × P26

FLOW DIAGRAM AND CODING FOR DEUCE PROGRAM No 261 (ZP29)

Date

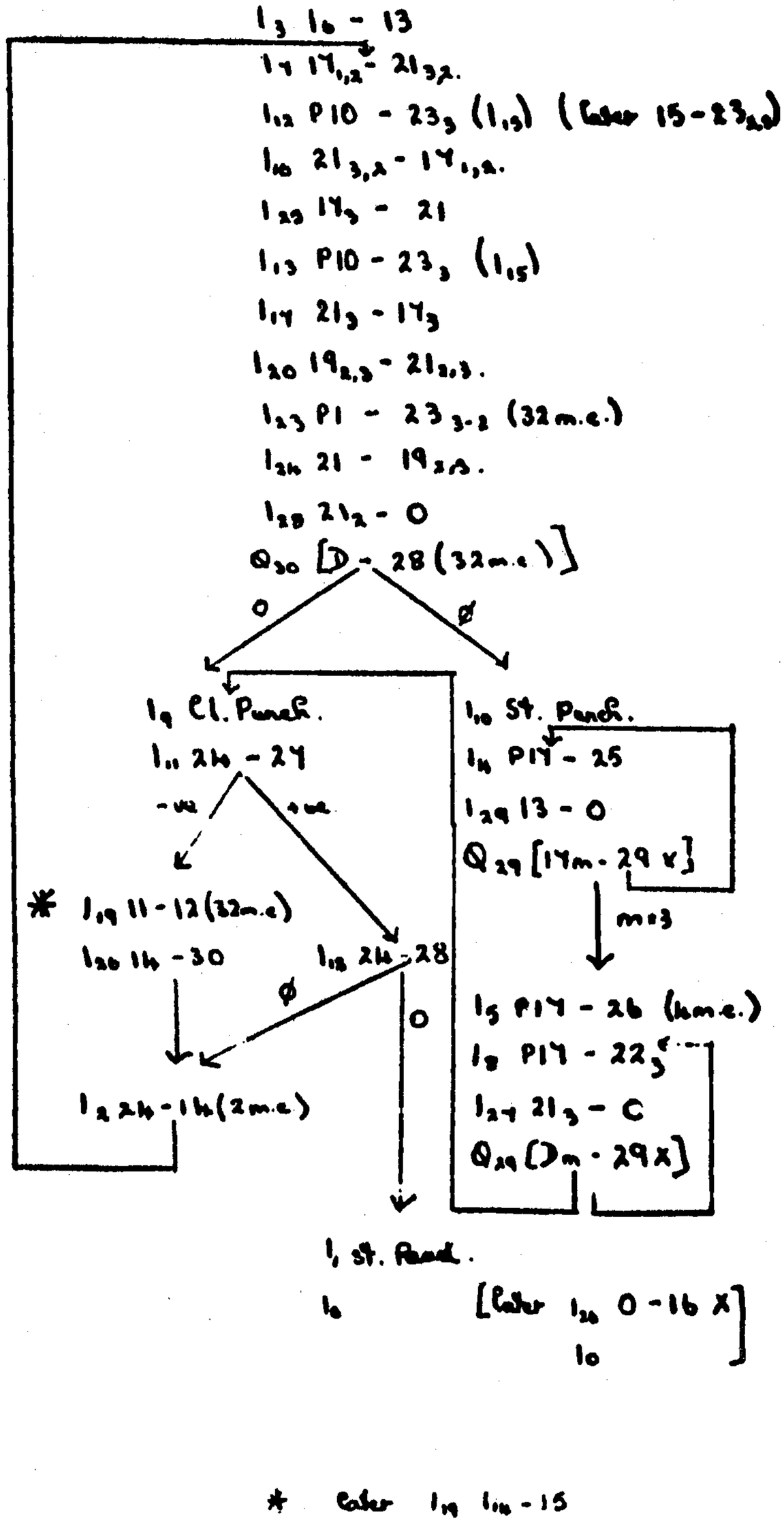
File Ref.

Sheet Ref. S6/10736

D.L. 1 Track

Card Nos. ~~11-13~~ 11-13

mc	NIS	S D	C	W T		
	1	0 - 14		0 28	X	Y
		P36 +		P31		X
	1	0 - 1	1	28 27	X	0
	1	0 - 1		30 31	X	1
0	1	9 - 24		0 29		2
1						3
2	1	12 - 24		0 29		4
3	1	24 - 14	2	0 3		5
4	1	1 - 13		1 2		6
5	1	28 - 25		0 23		7
6	1	28 - 26	1	0 1		8
7	1	16 - 29		28 (15) 5	X	9
8	1	16 - 21	2	0 3		Y
9	1	28 - 22		1 16		X
10	1	9 - 24		0 0		0
11	1	10 - 24		0 24		1
12	1	24 - 26		0 5		2
13	1	1 - 23		1 2		3
14	1	1 - 23		0 2		4
15		P2 +	P	10		5
16		P10				6
17	1	21 - 16	2	3 7		7
18	1	21 - 16		0 1		8
19	1	24 - 28		0 13		9
20	1	11 - 12	1	6 5		Y
21	1	19 - 21	2	0 1		X
22	1	13 - 29		0 (15) 9	X	0
23	1	13 - 28	1	10 9		1
24	1	29 - 23	1	0 31		2
25	1	21 - 19	2	0 2		3
26	1	19 - 21		0 18		4
27	1	14 - 30		0 6		5
28		21 - 0		0 0		6
29		21 - 0		0 0		7
30		13 - 0	1	0 30		8
31	1	1 - 13	2	21 3		9



* Enter I_{19} I_{18} - 15
I_2

FLOW DIAGRAM AND CODING FOR DEUCE PROGRAM

SHEET PUNCH NON-ZERO D.L.D. (2 of 2) No 2601

Date

File Ref.

Sheet Ref. S6/10737

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

N.110

D.L. 1 Track

Card Nos. ~~2[illegible]~~ 16-18

REC	NOS	S D	C	W T		
		P 15				Y
	1	0 - 1	1	28 27	X	X
	1	0 - 1		30 31	X	0
	1	0 - 1		30 12	X	1
0	1	16 - 21		0 21		2
1	1	0 - 31		0 8		3
2	1	21 - 14		0 1		4
3	1	9 - 24		0 1		5
4	1	1 - 13		2 16		6
5	1	23 - 14	1	0 15		7
6	1	16 - 21		0 Y		8
7	1	10 - 28	1	2 1		9
8	1	0 - 30		0 10		Y
9	1	11 - 10	1	18 17		X
10	1	9 - 24		0 8		0
11	1	10 - 24		0 1		1
12	1	28 - 22		0 3	X	2
13	1	9 - 24		0 17		3
14	1	28 - 23		0 0		4
15	1	0 - 22		1 6	X	5
16	1	21 - 29		0 0	X	6
17	1	1 - 1		0 0	X	7
18	1	1 - 13		1 24	X	8
19	1	28 - 25		0 6		9
20	1	24 - 14	1	1 4		Y
21	1	11 - 29		0 (15) 20	X	X
22	1	1 - 15		0 1		0
23	1	30 - 10	1	7 6		1
24		15 x P5				2
25	1	28 - 25		0 0		3
26	1	1 - 15		1 2		4
27	0	13 - 0		0 0		5
28	1	28 - 22		0 1		6
29		P 13.				7
30	1	26 - 28		0 3		8
31	1	1 - 13		0 1		9

Q_{29}

Q_{29}

Q_{29}

l_{13} cl. Rd.

l_0 $16 - 21_2$

l_{23} cl. P 10 (32 m.c.)

l_{31} $1_1 - 13$ (0 - 31)

l_2 $21_2 - 14$

l_5 23 - 14 (16 m.c.)

l_{22} $l_{24} - 15$ 15 x P5

l_{29} 25 - 25

l_{24} 13 - 0

Q_{29} [0 - 31] [0 - 30]

l_7 10 - 28 (32 m.c.)

0 ∅

l_9 $11 - 10$ (32 m.c.)

l_{20} P17 - 22_2

l_{10} cl. Punch.

l_{20} $24 - 14$ (4 m.c.)

l_{26} P.13 - 15 (l_{29})

l_{30} $26_2 - 28$

∅ 0

l_4 $l_8 - 13$ (0 - 30)

l_{11} st Punch.

l_{19} P17 - 23_2

l_{28} $21_2 - 29$ X

l_{18} $l_{21} - 13$ X (11 - 29 X)

l_{12} P17 - 22_2 X

l_{17} 1 - 1 X

l_{16} P17 - 25

l_1 cl. Rd.

l_6 $16 - 21_2$

l_{27} 13 - 0

l_{15} 0 - 22_2 X

Q_{29} [11 - 29 X]

FLOW DIAGRAM AND CODING FOR DEUCE PROGRAM No 261

SHEET 8

PUNCH NON - ZERO TRACKS (2P24)

Date

File Ref.

Sheet Ref. S6/10739

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

N.110

D.L. \ Track

Card Nos. ~~40 — 21~~ 14, 15

mc	NIS	S D	C	W T			
	1	0 - 14		0 28	X	Y	Q_2
		P20 + P29				X	
	1	0 - 1		15 28	X	0	Q_2
	1	1 - 15		25 13		1	Q_{19}
0	1	0 - 1		8 28	X	2	Q_2
1	1	15 - 23	2	0 2		3	1_{12}
2	1	18 - 17	1	0 28		4	Q_2
3	1	0 - 0		0 28		5	
4	1	0 - 0		0 28		6	
5	1	30 - 11	1	29 28		7	Q_2
6	1	14 - 30	1	0 28		8	Q_2
7	1	9 - 24		0 31		9	Q_2
8	1	16 - 1		11 28		Y	Q_2
9	1	0 - 1		29 28	X	X	Q_2
10	1	12 - 24		0 23		0	Q_1
11	1	0 - 1		22 28	X	1	Q_2
12	1	0 - 16		0 4	X	2	1_{26}
13	1	0 - 13		0 28	X	3	Q_2
14	(1) 1	0 - 12		1 (2) 0	X	4	Q_{29}
15	1	16 - 14		0 28		5	Q_2
16	1	23 - 14	1	20 28		6	Q_2
17	1	14 - 26		0 28		7	Q_2
18	1	30 - 14		0 25		8	Q_2
19	1	9 - 24		0 30		9	
20						Y	
21						X	
22						0	
23						1	
24						2	
25						3	
26						4	
27						5	
28						6	
29						7	
30						8	
31						9	

Q_2 P20 + P29 - 14 (X-rows)
Q_2 "1_{14} - 15" - 1_2 (1-rows)
Q_2 "15 - 23(2)" - 1_{18} (3-rows)
Q_2 18 - 14 (e)

Q_2 cf. 11 (32 m.e.)
Q_2 14 - 30 (e.)
Q_2 of Read.
1_3 of previous sheet.

Q_2 16 - 1_9
Q_2 "st Rd" - 1_{31} (0 rows)
Q_2 "0 - 16" - 1_{26} (2-rows)
Q_2 "0 - 12" - 13 (4-rows)
Q_2 16 - 14
Q_2 23 - 14 (9 m.e.)
Q_2 14 - 26
Q_2 ck 14.
1_{29} 13 - 0
Q_{29} [0 - 12 X] (9 - 24. 0, 30)
1_{31} of previous ~~subroutine~~ sheet.

FLOW DIAGRAM AND CODING FOR DEUCE PROGRAM NO 471 (-P-1)

SHEET 7.

Date

File Ref.

Sheet Ref. S6/10738

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