DEUCE Programme No. 495 (ZP29T/3)

Post Mortem (for Mk. I, II or IIA Machines).

SUMMARY.

This programme is designed to punch out the complete contents of the mercury and drum stores (or as much as is required) as far as is possible. It will operate on all types of DEUCE except the Mk. 0, giving output relevant to the type of machine without assistance from the operator.

The output is synchronised with a standard P_{31} clock track in track 15/15 (if this is in an EVEN m.c.) or the programme selects an even m.c. as m.c. 0 in the absence of a valid clock track.

DEUCE Programme No. 495 (ZP29T/3)

Post Mortem (for Mk. I, II or IIA Machines).

OPERATING INSTRUCTIONS.

Input. Programme cards 0-19.

The following operations should be performed on the control panel to ensure satisfactory operation.

(1) Put computer to STOP.
(2) Depress the External Tree Key.
(3) Set 9-24 on I.S. Keys. } only required if 80 col. read or punch called but not yet completed.
(4) Give single shot. }
(5) Set MWS Key on Tape panel to TEST (Magnetic Tape machines only).
(6) Set 30-0 1 on I.S. Keys.
(7) Give single shot (The I.S. lights should all go off).
(8) Set external tree key to centre position.
(9) Put the computer to NORMAL.
(10) Press the READ key.
(11) Run in programme.

If the machine stops on 8, 12-24X then (9) above has been omitted.
If the machine stops on 1, 10-1X run in the punch.
If the machine stops at 7, 17-0X after reading the first card the reader is switched to 32 column. Switch to 64 column, reassemble the pack, and return to (1) above.

Output. If the operator takes no further action, the following output is obtained:-

Card 1. X row I.D.
2 row TS13.
4 row TS14.
6 row TS15.
8 row TS16 if TCA OFF. (All ones on 8 & 9 row if TCA ON).

Card 2. Y, X rows DS19)
2, 3 rows DS20) even half first.
6, 7 rows DS21)
8, 9 rows All ones if TCB ON.

Card 3. Y-1 rows QS17
3-4 rows All ones if TCC ON (Mk. IIA only).
6-9 rows QS18.

During this period the alarm will sound.

Cards are then punched in the following order, provided the relevant stores are non-zero.

OPERATING INSTRUCTIONS CONT'D.

D.L. 12 m.c. 0-15 } in 80 col. fashion, Mk. II or IIA only.
D.L. 12 m.c. 16-31 }
D.L.'s 12 and 11.
D.L.'s 10 and 9.
D.L.'s 7A to 1A (Mk. IIA only).
D.L.'s 8 to 3.
D.L.'s 2 and 1. (always punched).

NOTE: D.L.'s have 64 col. filling instructions and also the D.L. number x P_{22} on Y row of each field, with P_{31} added if it is an "A" delay line.

One minor cycle of D.L. 8 is always lost. It is punched as 8, 9-24, 0, 30, and the fillers for D.L. 1 lead to this minor cycle.

Then follow all non-zero tracks on the drum except for track 15/14 which is overwritten by zeros. The drum triads have T.P_1, where T is the track number, on the Y-row. They are in a form which can be read by ZP49T, (No. 492), but not necessarily by ZP39T, (No. 358), (because the triads may have tracks for different head positions on the same triad).
If track 15/15 is a P_{31} clock track all punching will be in correct phase (e.g. contents of 12$_9$ will be on the 2-row of the first card of the D.L.12 triad).

At the end, the programme stops on 3, 0-22X.

Selection of Output. If the DISCRIM key is raised at any stage AFTER THE BUZZER STARTS TO SOUND, punching ceases at the end of the present card (or triad) and the routine stops on 3, 0-22X. Then, if a track number TP_{17} is set on the I.D. and a single shot given, punching is continued from track T onwards.

This selection can be performed for as many values of T as required.

If the DISCRIM key is raised during the punching of D.L.'s then no further D.L.'s can be punched.

N.B. Where POST MORTEM is being used to detect programme errors (its usual function) it is false economy to cut short the punching of the D.L.'s.

The Machines Action. After punching the short stores and the D.L.'s (these punchings are interspersed with card reading) the last 3 cards are read to punch out the tracks, beginning at 0/0. While these 3 cards are being read the I.S. lamps show 4, 0-3X. While tracks are being punched $20_{2,3}$ show (times P_1) the numbers of the next pair of tracks which will be punched, or all ones if another NZ track has not yet been found. TS13 shows (times P_1) the track at present under investigation.

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Post Mortem (for Mk. I, II or IIA Machines).

OPERATING INSTRUCTIONS CONT'D.

The Final State of the Machine.

Various parts of the high speed store are changed by POST MORTEM. The drum remains in the state which it was in before POST MORTEM was used, apart from track 15/14 which is left blank, and the positions of the read and write heads.

January, 1960.

D.P. & C.S.D., Kidsgrove.

DEUCE Programme No. 495 (ZP29T/3).

Post Mortem (for Mk. I, II or IIA Machines).

Punch Short Tanks.

D.L. Track

Card Nos. 0, 1.

	mc	A	NIS	S	D	C	W	T		
			8	30	8		28	28	x	Col. 54 punched.
				BLANK						
			8	15	31	1	0	28	x	
				BLANK						
0			8	14	30	1	0	28	x	
1				BLANK						
2			8	8	11	1	29	28	x	
3				BLANK						
4			8	30	8	1	29	28	x	
5				BLANK						
6			8	0	8	1	29	12	x	
7			8	12	24		0	29		Col. 1 Punched.
8			8	0	8	1	27	5/16		
9			8	0	8	1	19	28		
10			8	9	24		0	10		20
11			8	16	29		9	15	x	19
12			8	30	8	1	13	12		18
13			8	21	15		1	0	x	17
14			8	31	21	2	0	28		16
15			8	15	29		0	0	x	15
16			8	12	24		0	2		14
17			8	16	26		16	0	x	13
18			8	21	16		1	2		12
19			8	14	29		0	0	x	11
20			8	0	8		30	19		
21			8	0	8		20	6	x	
22			8	8	10	2	19	2		8
23			8	16	13		21	2	x	7
24			8	9	24		0	0		6
25			8	13	29		0	0	x	5
26			8	13	29		0	0	x	4
27			8	30	10		25	0	x	3
28			8	10	8	2	25	27	x	2
29			8	31	10		26	0	x	1
30			8	10	24		0	0		0
31			8	0	29		0	0	x	31

Q_0 0 - 0 x
Q_2 30 - 8_0 x
8_0 0 - 0 x
Q_2 15 - 31 l x
8_0 0 - 0 x
Q_2 14 - 30 l x
8_0 0 - 0 x
Q_2 8 - 11 (32me) x
8_0 0 - 0 x
Q_2 30 - 8 (32me) x
8_0 0 - 0 x
Q_2 0 - 8_{1-16} x — Clear read punched on Row 9.
8_{16} 12 - 24
⋮ — Obey 12-24 16 times to prevent reader paralysis
8_1 12 - 24
8_0 0 - 0 x

Read card 1 into DL B.

8_{20} 9 - 24
8_0 10 - 24
8_2 10 - 8_{29} (el) x
8_{31} 0 - 29 x — Punch I.D.
8_1 31 - 10_{29} x — Set for TCA marker.
8_3 30 - 10_{30} x
8_5 13 - 29 x — Punch TS 13.
8_7 16_{30} - 13 x
8_{11} 14 - 29 x — Punch TS 14
8_{13} 16_{31} - 26 x
8_{15} 15 - 29 x — Punch TS 15.
8_{17} 21_2 - 15 x
8_{19} 16_{30} - 29 x — Punch TS 16 or TCA marker.
8_4 13 - 29 x
8_6 9 - 24
8_8 8 - 10_{29} (d)
8_{12} 21_3 - 16
8_{16} 31 - 21 (d)
8_{14} 12 - 24
8_{18} 30 - 8 (32me)
8_0

N.B. The storage ms. for the instructions on card 1 are shown on right of coding.

m.c. 20 - 11 are punched on α field rows 0-9
m.c. 8 - 31 are punched on β field rows 0-9.

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Post Mortem (for Mk. I, II or IIA Machines).

Set up Even Minor Cycle.

D.L. Track

Card Nos. 2

m.c.		A	NIS	S	D	C	W	T	
	1		8	0	8	1	27	26	
			8	0	8	1	19	28	
20			8	27	22	2	0	9	
19									
18	0								
17			8	24	14	1	30	13	
16	2								
15	3								
14	4		8	21	14		1	1	
13	5								
12	6								
11	7		8	27	22		1	1	
	8		8	0	8		30	19	
	9		8	0	8		20	8	x
8	0		8	30	8	1	24	23	
7	1		8	30	8	1	24	23	
6	2		8	31	21	2	0	3	
5	3		8	14	28		0	0	
4	4		8	4	24		0	0	
3	5		8	15	31		0	29	
2	6		8	16	21		1	1	
1	7		8	21	25	2	0	1	
0	8		8	15	21		0	1	
31	9		8	31	13		0	0	
	20								
	21								
	22								
	23								
	24								
	25								
	26								
	27								
	28								
	29								
	30								

α field

β field.

8_{20} 27-22 (d) Set up
8_{31} 31-13 TCB marker.
8_1 21-25 (d)
8_4 4-24
8_6 31-21 (d)
8_{11} $27-22_2$ Set marker
8_{14} 21_3-14 for even or
8_{17} 24-14 (16 mc) odd.
8_0 $15-21_2$
8_3 15-31
8_2 $16-21_3$
8_5 14-28

0 / 4

8_7 30-8 (32 mc) 8_8 30-8 (32 mc)
8_0 8_1 = new mc. 0.

DEUCE Programme No. 495 (ZP29T/3).

Post Mortem (for Mk. I, II or IIA Machines).

Punch Double Stores.

D.L. Track

Card Nos. 3

m	A	NIS	S	D	C	W	T		me.
		8	0	8	1	27	~~16~~ 5		
		8	0	8	1	19	28		
		8	9	24		0	10		20
		8	1	1		0	10	x	19
0		8	30	8	1	6	5		18
1		8	30	8	1	8	7		17
2		8	20	29		1	1	x	16
3		8	9	24		0	18		15
4		8	20	29		0	0	x	14
5		8	14	28		0	2		13
6		8	15	29		0	1	x	12
7		8	30	13		0	1	x	11
8		8	0	8		30	19		
9		8	0	8		20	8	x	
10		8	15	29		0	2	x	8
11		8	13	15		0	2	x	7
12		8	14	26		0	5		6
13		8	21	29		0	1	x	5
14		8	19	29		1	1	x	4
15		8	12	24		0	1		3
16		8	19	29		0	0	x	2
17		8	21	29		1	2	x	1
18		8	10	24		0	0		0
19		8	1	1		0	0	x	31
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

α field

β field.

8_{20} 9-24
8_0 10-24
8_2 19_2-29x
8_4 19_3-29x — DS 19
8_7 13-15x
8_{11} 30-13x
8_{14} 20_2-29x
8_{16} 20_3-29x — DS 20
8_{19} 1-1x
8_{31} 1-1x
8_1 21_2-29x
8_5 21_3-29x — DS 21
8_9 15-29x — TcB marker.
8_{12} 15-29x
8_{15} 9-24
8_3 12-24
8_6 14-26 — Odd me marker (-P_{17})
8_{13} 14-28

0 / φ

8_{17} 30-8 (32me) 8_9 30-8 (32me)

8_{26} 8_{25} = old 8_{26}.

DEUCE Programme No. 495 (ZP29T/3)

Post Mortem (for M . I, II or IIA Machines).

Synchronise With Clock Track-Section 1.

D.L. Track

Card Nos. 4

Int	A	NIS	S	D	C	W	T		mc.
		8	0	8	1	27	26		
		8	0	8	1	19	28		
		8	9	24		0	21		14
		8	11	15		17	18		13
0		8	11	8	1	16	15		12
1		8	11	16		12	0		11
2						31 P_{17}			10
3		8	11	21	2	19	0		9
4		8	8	11	1	15	22		8
5		8	11	20	2	19	0		7
6		8	11	14		0 (15)	9		6
7		8	11	19	2	19	0		5
8		8	0	8		30	19		
9		8	0	8		20	8	X	
10		8	8	15		6	8		2
11		8	8	25		3	5		1
12		8	15	11		30	0		0
13		8	12	24		0	31		31
14		0	13	0		14	14		30
15		8	15	30		0	31		29
16		8	28	14		0	1		28
17		8	28	25	2	0	1		27
18		8	30	14		0	3		26
19		8	24	27		0	0		25
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

α field

β field.

8_{14} 9-24

8_5 11_{26} - 19 (d) Clear working

8_7 11_{28} - 20 (d) space in DL 11.

8_9 11_{30} - 21 (d)

8_{11} 11_{25} - 16

8_{13} 11_0 - 15

8_1 8_6 - 25 Add instruction to add mc. marker.

8_6 8_{25} - 11 (8mc)

8_0 15 - 11_0

8_2 8_{10} - 15 (31 P_{17}) Clear DL 11 for clock track.

8_{12} 11 - 8 (32mc)

8_{29} 15-30 Read clock track.

8_{30} 13-0

Q_{14} [11_{16} - 14] Inspect all even mc. spill. - no clock track.

8_{25} 24-27 (+)

8_{26} 30-14

8_{27} 28-25 (d)

8_{28} 28-14 (-)

8_{31} 12-24

8_0

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Post Mortem (for Mk. I, II or IIA) Machines).

Synchronise with Clock Track - Section 2.

D.L. Track

Card Nos. 5

ind	A	NIS	S	D	C	W	T	
		8	0	8		21	28	
		8	0	8		22	28	
		8	0	8		23	28	
		8	0	8		24	28	
0		8	0	8		25	28	
1		8	0	8		27	28	
2		8	13	11	2	12	28	α field
3		8	24	25		0	26	
4		8	0	0		0	28	
5		8	0	0		0	28	
6		8	0	0		0	28	
7		8	0	0		0	28	
8		8	28	25	2	0	1	Q_{25}
9		8	25	14		0	31	Q_{26}
10		8	30	15		0	0	Q_{27}
11		8	24	27		0	0	Q_{28}
12		8	14	30		0	1	Q_{29}
13		8	30	11	2	15	29	Q_{31}
14								β field.
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

```
8₀    0-0x
Q₂    0-8₂₅
8₀    0-0x
Q₂    0-8₂₆
8₀    0-0x
Q₂    0-8₂₇          Reset instructions
8₀    0-0x           in 8₂₅₋₂₉ and 8₃₁
Q₂    0-8₂₈
8₀    0-0x
Q₂    0-8₂₉
8₀    0-0x
Q₂    0-8₃₁
8₀    0-0x
Q₂    13-11₁₆ (d)    Store modified instruction
                     in 11₁₆,₁₇.
8₀    0-0x
Q₂    24-25          Add P₁₈ if valid clock
                     found.
                 |
8₃₀   13-0
Q₁₄ [11₁₆-14]        Check for second P₃₁
                 |   spill mc. 16 second time
8₂₅   28-25 (d)
8₂₈   24-27
+        |-
8₃₁   30-11₁₆ (d)    Clear 11₁₆,₁₇ if
                     second P₃₁ found.
8₂₆   25-14          Extract Wait No.
8₂₇   30-15
8₂₉   14-30          Call down DL 11.
8₀
```

DE'CE Programme No. 495 (ZP29T/3).

Post Mortem (for Mk. I, II or IIA Machines).

Synchronise with Clock Track Section 3.

D.L. Track

Card Nos. 6.

	A	NIS	S	D	C	W	T	
		8	0	8		22	28	
		8	0	8		23	28	
		8	11	28	1	23	22	
		8	29	8		29	29	
0		8	20	11	2	24	29	
1		8	16	11		21	29	
2		8	13	25	1	21	29	
3		8	0	19	2	24	28	
4		8	0	20	2	24	28	
5		8	0	21	2	24	28	
6		8	0	25		24	28	
7		0	13	0		26	26	
8		8	8	11	1	5	4	
9		8	31	15		0	29	
0			BLANK					
1		8	19	11	2	21	27	
2		8	21	11	2	25	27	
3		8	14	13		0	27	
4		8	14	25		0	27	
5		8	31	29		0	0	X
6		8	18	29		29(15)	15	x
7		8	17	29		29(15)	4	x
8		8	30	8	1	1	0	
9			BLANK					
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								

α field

β field.

8_0 0 - 0 x

Q_2 0 - 8_{26}

8_0 0 - 0 x

Q_2 0 - 8_{27}

8_0 0 - 0 x

Q_2 11 - 28 (32me) Is DL 11 zero?

0 → ϕ

8_{27} 31-15

8_{26} 8 - 11 (32me) Put DL 8 back in DL 11.

Q_2 29 - 8_1

8_1 0 - 0

Q_3 19 - 11_{26} (d)

8_0 0 - 0 x

Q_2 20 - 11_{28} (d) Replace instructions

8_1 0 - 0 previously stored

Q_3 21 - 11_{30} (d) elsewhere.

8_0 0 - 0 x

Q_2 16 - 11_{25}

8_1 0 - 0

Q_3 14 - 13

8_0 0 - 0 x Set up W and T

Q_2 13 - 25 (9me) to synchronise.

8_1 0 - 0

Q_3 14 - 25

8_0 0 - 0 x

Q_2 0 - 19 (d)

8_0 0 - 0 x

Q_2 0 - 20 (d) Store instructions

8_0 0 - 0 x in 19, 20, 21 for use

Q_2 0 - 21 (d) later.

8_0 0 - 0 x

Q_2 0 - 25 Add instruction to W and T.

8_0 0 - 0 x

Q_2 13 - 0

Q_{30} [30 - 8 (32me)] clear DL 8 and call true 8_0 (synchronised).

B_0 = True 8_0

DEUCE Programme No. 495 (ZP29T/3).

Post Mortem (for Mk. I, II or IIA Machines).

Punch Quadruple Stores.

D.L. Track

Card Nos. 7

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

α field

β field.

8_{20} 9-24
8_{13} 7-24 Buzzer to indicate synchronising completed.
8_{31} 10-24

8_{19} 21_3-0
Q_{29} $[17_0-29\,x]$ Punch QS 17.
spill
8_3 28-22_3
8_4 1_0-17
8_1 $1A_0$-16
8_5 19-$1A_0$ x
8_7 8-1_0
Tee off
1_0 1-1 x
8_8 1-1 x
Tee on
$1A_0$ 31-29 x Tee marker.
8_2 31-29 x
8_{11} 14-24 Clear Tee.

8_6 20-21_3 x
8_{19} 21_3-0
Q_{29} $[18_0-29\,x]$ Punch QS 18.
spill
8_{14} 28-22_3

8_{15} 9-24
8_{17} 12-24
8_{12} 16-$1A_0$
8_{16} 17-1_0
8_{18} 30-8 (32mc)
8_0

DEUCE Programme No. 495 (ZP29T/3).

Post Mortem (for Mk. I, II or IIA Machines).

Punch D.L.12 in 80 column Mode.

D.L. Track

Card Nos. 8

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

α field.

β field.

8_{20} 9-24
8_2 8_4-13
8_5 14-26
8_{17} 8_3-16
8_6 13-0
Q_{30} [16-11_m] Plant 9-24 in "last mc"
8_8 2-24 ϕ Wait for end of programme TIL.
0
8_7 12-28 (32mc)
0 α
8_{12} 10-24 ℓ (mc 16)
8_{16} 2-24
ϕ 0
8_{19} 6-24 8_{18} 9-24 Clear punch if TIL zero (ie not 80 col. mc).
8_1 2-24 ϕ
0
8_0 10-24 ℓ (mc 0)
8_{14} 2-24 ϕ
0
8_{13} 31-15 Set marker for DL 12 ϕ.
8_{11} 6-24
8_{15} 12-24
8_{31} 30-8 (32mc)
8_0

DEUCE Programme No. 495 (ZP29T/3).

Post Mortem (for Mk. I, II or IIA Machines).

Punch D.L.'s 12 and 11.

```
8₀   0-0x
     Read Card 9
8₂₀  30-8₂₂₋₂₉
8₂₉  0-0x
Q₃₁  29-8₃₀        Y row
8₃₀  0-0
Q₀   11₂₈-19 (d)
8₂₇  0-0x
Q₂₉  11₀-20 (d)    X row.
8₃₀  0-0
Q₀   11₂₄-18 (4mc)
8₂₇  0-0x
Q₂₉  5-24          O row
8₃₀  0-0
Q₀   30-11₀
8₂₉  0-0x
Q₃₁  0-11₂₄        1 row
8₂₉  0-0x
Q₃₁  0-8₂₄         2 row
8₂₉  0-0x
Q₃₁  0-8₂₅         3 row
8₂₉  0-0x
Q₃₁  0-8₂₆         4 row
8₂₉  0-0x
Q₃₁  0-8₂₇         5 row
8₂₉  0-0x
Q₃₁  0-8₂₈         6 row
8₂₉  0-0x
Q₃₁  0-17₁         7 row
8₂₉  0-0x
Q₃₁  0-17₀         8 row
8₂₉  0-8x
Q₃₁  0-8₂₉         9 row.
8₃₁  24-14 (9mc)
8₂₄  15-28
     0
∴ DL 11,12 ZERO.
8₁₄  11-8 (32mc)
8₀   Read card 11.
```

```
8₁₅  9-24
8₁₉  10-24
     |
8₁₁  17₀-0   +P₁₇
Q₂₈  [8₀-29x]
8₀   8-24 ℓ          Punch filling instructions.
8₁₃  17₁-0 ℓ  +P₁₇+P₂₂
Q₁   [8₄-29]
     | spill 4th time
8₁₂  8₁₆-17 (d)
8₁₈  11-8₃₀₋₂₄
8₂₄  14-30
8₂₈  17₀-0   +P₁₇
Q₂₈  [12₀-29x]       Punch DL 12 and 11.
8₂₅  8-24 ℓ
8₂₇  17₁-0   +P₁₇
Q₂₉  [11₀-29]
     | spill 32nd time
8₂₉  9-24
8₂₆  10-24
8₀   Read Card 11.
```

DEUCE Programme No. 495 (ZP29T/3).

Post Mortem (for Mk. I, II or IIA Machines).

Punch D.L.'s 12 and 11.

D.L. Track Card Nos. 9								D.L. Track Card Nos. 10								D.L. Track Card Nos.							
mc	A	NIS	S	D	C	W	T	mc	A	NIS	S	D	C	W	T	mc	A	NIS	S	D	C	W	T
		8	0	8	1	27	5			8	29	8		29	29								
		8	0	8	1	19	28			8	11	20	2	31	31								
20		8	30	8	1	0	7			8	5	24		0	31								
19		8	10	24		31	22			8	0	11		23	28								
18		8	11	8	1	10	4	0		8	0	8		23	28	0							
17		8	11	29		0 (15)	29	1		8	0	8		24	28	1							
16		8	12	29		1	27	2		8	0	8		25	28	2							
15		8	9	24	2	2	2	3		8	0	8		26	28	3							
14		8	11	8	1	17	16	4		8	0	8		27	28	4							
13		6 P_1	17	0	1	18	18	5		8	0	17		28	28	5							
12		8	8	17	2	2	4	6		8	0	17		27	28	6							
11		2 P_1	17	0	1	15	15	7		8	0	8		28	30	7							
8		8	0	8		30	19	8		8	11	19	2	26	28	8							
9		8	0	8		20	8	x	9	8	11	18	1	22	25	9							
8		8	8	24	1	0	3		10	8	30	11		30	27	10							
7		1	0	11		30	31		11	8	14	30		0	2	11							
6		3	0	11		30	31		12	8	15	28		0	20	12							
5		2	0	12		30	30	x	13	8	8	24	1	0	0	13							
4						11 P_{22}			14	8	12	24		31	4	14							
3		3	0	2		27	28		15	2 P_1	17	0		0	0	15							
2		1	0	2	1	29	28		16	2 P_1	17	0		30	30	16							
1		1	0	3	1	27	26		17	8	8	29		0 (12)	8	17							
0						12 P_{22}			18	8	8	29		1	10	x	18							
31		8	24	14	1	15	23		19	8	9	24		28	27		19							
20									20								20							
21									21								21							
22									22								22							
23									23								23							
24									24								24							
25									25								25							
26									26								26							
27									27								27							
28									28								28							
29									29								29							
30									30								30							

A - field

B - field

DEUCE Programme No. 495 (ZP29T/3).

Post Mortem (for Mk. I, II or IIA Machines).

Set up to Punch D.L.'s.

	8_0	0 - 0 x
Y row	Q_2	29 - 8_1
	8_1	0 - 0
	Q_3	8 - 12_{32} (mc)
	8_0	0 - 0 x
X row	Q_2	~~7 - 11 (32mc)~~ 19 - 12_{18} (d)
	8_1	0 - 0
	Q_3	~~19 - 12_{18} (d)~~ 7 - 11_{32}
	8_0	0 - 0 x
0 row.	Q_2	20 - 12_0 (d)
	8_1	0 - 0
	Q_3	18 - 12_{24} (d)
	8_0	0 - 0 x
1 row.	Q_2	18 - 12_{26} (d)
	8_1	0 - 0
	Q_3	30 - 19 (d)
	8_0	0 - 0 x
2 row	Q_2	0 - 13
	8_0	0 - 0 x
3 row	Q_2	14 - 26
	8_1	0 - 0
	Q_3	13 - 18_3
4 row	8_0	0 - 0 x
	Q_2	0 - 17_0
5 row	8_0	0 - 0 x
	Q_2	0 - 17_1
6 row	8_0	0 - 0 x
	Q_2	0 - 8 (32mc)
	8_0	17_0 - 0
	Q_{28}	[0 - 7_6 x]
	8_1	17_1 - 0
	Q_{29}	[0 - 8_6]
	8_0	

Replace instructions from DL 8.

Set up entry instruction for fillers for DL 2 and 1.

Read rest of card 11 and cards 12-13 to DL's 7 and 8. mc 6 - 31 and 0.

DEUCE Programme No. 495 (ZP29T/3).

Post Mortem (for Mk. I, II or IIA Machines).

Punch D.L.'s.

8_0 30-15
7_6 9-28 (32mc)
o/ \p
7_8 10-28 (32mc) 7_9 1-1
•| \p
7_{11} 9-24
7_{15} 7_{21}-21 (d)
7_0 7_{20}-16
7_{25} [PUNCH] Punch DL 10, 9
Q_{30} 12-24 if either non-zero.

7_{10} $7A_0$-13 Start IIA check.
7_7 30-7_0
7_0 0-0 x
Q_2 5-9 (32mc) Shift DL's 5-6 into
7_0 0-0 x DL 9-10.
Q_2 6-10 (32mc)
7_0 0-0 x
Read rest of cards 14-16 into DL 5.6.

6_0 $7A_0$-26
6_1 9-24 Is this IIA machine?
5_3 13-28
YES. o| \p No
5_5 27-19 (d)
6_8 6_{15}-18_1 P_{31}
5_{13} 6_{15}-13 $8P_{22}+P_{31}$ Punch DL's 7A to 1A in pairs, non zero DL's only.
6_{24} 6_{26}-17_2 (d)
6_5 [SR]
Q_3 30-19 (d)
|
5_1 5_{18}-17 (d)
5_{21} 5_{25}-18_1 $2P_{22}$
5_0 5_2-15 P_7
6_2 6_4-13 $9P_{22}$ Punch DL's 8-3 in pairs, non-zero DL's only.
6_5 [SR]
Q_3 5_5-21 (d)
5_{17} 6-8_{18} (3mc)
5_{20} 6-8_{29} (d)
5_{22} 18-8_{31}
5_1 6_3-16
7_{25} [PUNCH] Punch DL 2 and 1 always, unless overridden by DISCRIM key.
Q_{30} 30-11 (32mc)
5_7 14-30 l clear track 15/14.
7_{20} 12-24
7_0 0-0 x
Read cards 17-19

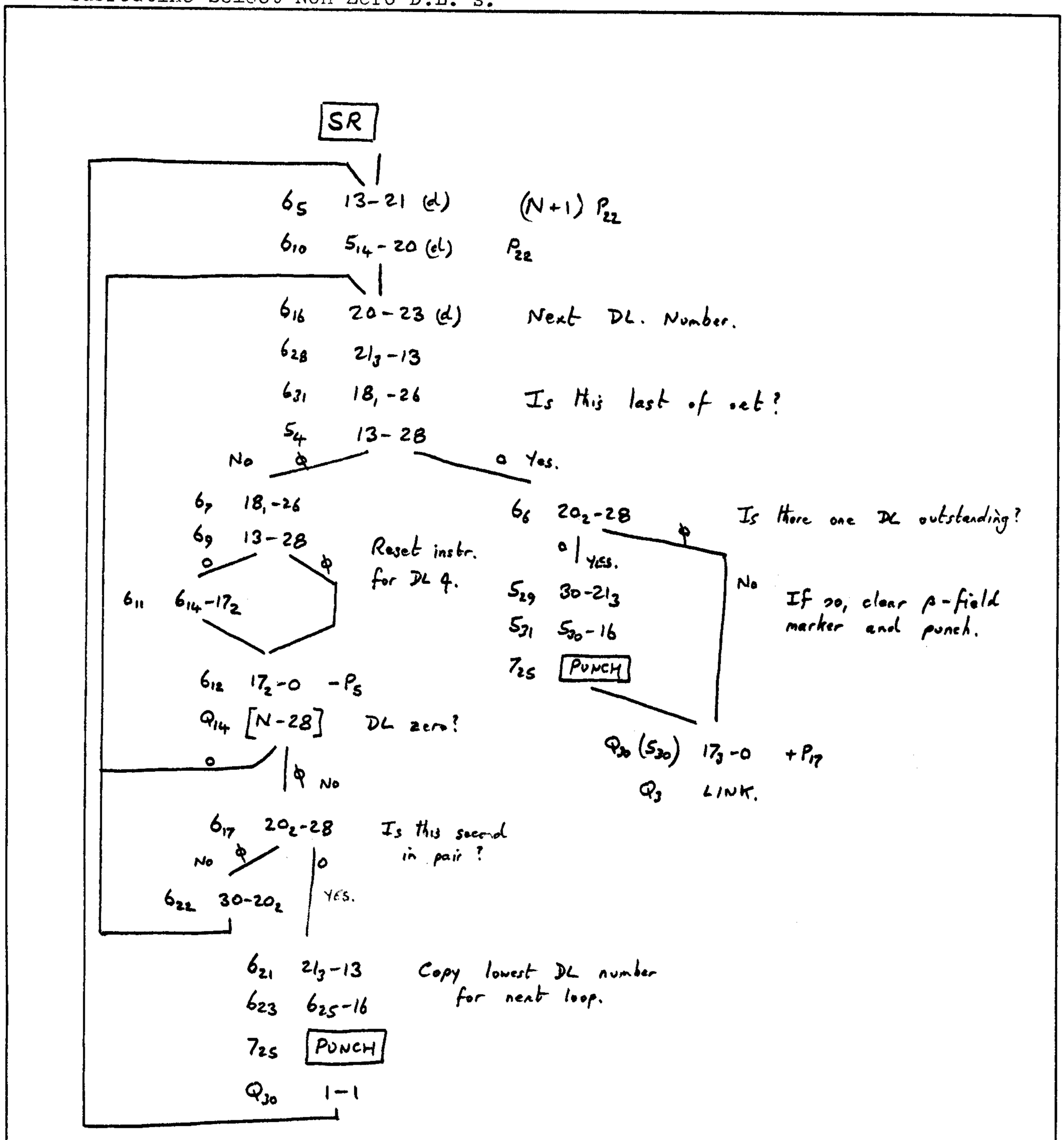
PUNCH.

7_{25} 31-28 For DISCRIM override only.
p/ •
8_{28} 10-24
8_9 7_{12}-17_0 (d)
7_{14} 21_2-29 x DL no. x P_{22}
7_{16} 8-24 l on Y row.
7_{18} 21_3-29
8_{22} 21-22 (4mc)
7_{29} 22-21 (28mc)
7_{28} 19-22 (d)
7_{31} 21_2-14
6_4 17_0-0
Q_0 [8_{18}-29 x] Punch fillers.
8_{23} 8-24 l
8_{26} 14-29
8_1 17_1-0
Q_{29} [8_{29}-29] spill 8_{31}.
8_7 21_3-4
8_9 22-21 (10mc)
8_6 19-22 (d)
8_0 27-23 (32mc)
8_{12} 21_2-14
8_{14} 25-22_2 Form
7_{17} 21_3-14 punching
7_{19} 25-22_3 instr.
8_{21} 23-14 (8mc)
7_{30} 24-14 (12mc)
8_{11} 14-22_3
8_{13} 8_{15}-22 (d)
8_{17} 21-17_0 (d)
8_{24} 30-14
8_4 17_0-0 Punch
Q_0 [0-29 x] DL's.
8_{23} 8-24 l
8_{26} 14-29
8_1 17_1-0
Q_{29} [0-29]
| spill me 31.
8_{25} 9-24
|
8_{27} 16-0
Q_{30}

DEUCE Programme No. 495 (ZP29T/3).

Post Mortem (for Mk. I, II or IIA Machines).

Subroutine-Select Non-Zero D.L.'s.



DATA PROCESSING AND CONTROL SYSTEMS DIVISION

ENGLISH ELECTRIC CO. LTD., KIDSGROVE

DEUCE Programme No. 495 (ZP29T/3).

Post Mortem (for Mk. I, II or IIA Machines).

Punch D.L.'s.

D.L. Track Card Nos. 11									D.L. Track Card Nos. 12									D.L. Track Card Nos. 13.								
mc	A	NIS	S	D	C	W	T		mc	A	NIS	S	D	C	W	T		mc	A	NIS	S	D	C	W	T	
		8	29	8		29	29		9		7	1	1		0	0		21						9 P_{22}	
		8	~~19~~ 12	2	24	~~30~~ 29			10	1	7	7	13		20	27		22						10 P_{22}	
		8	20	12	2	28	29		11		7	9	24		0	2		23							
		8	18	12	2	22	29		12		8	8	29		15	21	x	24							
0		8	0	13		28	28		13 0		8	8	29		29 (15)	8		25 0		8	31	28		0	0	
1		8	14	26		0	29		14 1		7	21	29		0	0	x	26 1								
2		8	0	17		28	28		15 2		7	7	21	2	1	15		27 2								
3		8	0	17		29	28		16 3		7	8	24	1	0	0		28 3		7	19	22	2	0	1	
4		8	0	8	1	29	28		17 4		7	21	14		0	0		29 4		7	22	21	1	2	29	
6 5		7	9	28	1	1	0		13 5		8	21	29		1	2		30 5		8	24	14	1	0	11	
7 6		7	30	7		23	23		19 6		8	25	22		0	0		31 6		8	21	14		1	3	
8 7		7	10	28	1	1	0		20 7		7	12	24		0	10		0 7		7	7	16		18	23	
8		8	8	12	1	28	27		9 8		7	7	17	2	1	3		21 8		7	23	14	1	0	7	
9		8	~~19~~ 7	~~12~~ 11	1 2	28	27		10 9		8	27	23	1	1	0		22 9		7	21	22	1	2	5	
10		8	18	12	2	19	27		11 10		8	14	22		0	0		23 10		8	8	24	1	0	1	
N		8	30	19	2	0	27		12 N		8	21	14		0	0		24 N		8	30	14		0	10	
12		8	0	0		30	31		13 12		8	8	22	2	0	2		25 12		8	9	24		0	0	
13		8	13	18		2	27		14 13		7	25	22		0	1		26 13		8	14	29		0	5	
14		8	0	7		7	3	x	15 14		8	1	29		0 (15)	25		27 14		8	16	0		1	1	
15		8	0	8		6	1		16 15		8	1	29		29	21	x	28 15		8	10	24		0	11	
16	2P	17	0		26	26			17 16		8	21	17	2	1	5		29 16		2	0	0		30	30	x
6 17		8	19	22	2	0	2		18 17		1	0	3	1	27	26		30 17		3	0	0		30	31	
7 18		8	21	14		0	27		19 18		1	0	2	1	29	28		31 18		1	0	0		30	31	
8 19		8	22	21	1	19	28		20 19		3	0	2		27	28		0 19		7	30	15		0	4	
20									20									20								
21									21									21								
22									22									22								
23									23									23								
24									24									24								
25									25									25								
26									26									26								
27									27									27								
28									28									28								
29									29									29								
30									30									30								

DL 7 in α-field

DL 8 in β-field

α - FIELD

β - FIELD

Post Mortem (for Mk. I, II or IIA Machines).

Punch D.L.'s.

D.L. 6 Track

Card Nos. 14-16 α field

mc	A	NIS	S	D	C	W	T	
Q_2		7	5	9	1	29	28	
Q_2		7	6	10	1	29	28	
		7	0	6	1	29	28	
		6	0	5	1	29	28	
0	1	6	7	26		30	31	
1		5	9	24		0	0	
2		6	6	13		0	1	
3		5	30	11	1	8	7	
4						$9P_{22}$		
5		6	13	21	2	0	3	
6		5	20	28		0	21	
7		6	18	26		0	0	
8		5	6	18		3	3	
9		6	13	28		0	0	
10		6	5	20	2	2	4	
11		6	6	17		1	31	
12		$8P_1$	17	0	1	0	0	
13						P_{31}		
14		6	5	28	1	1	0	
15						$8P_{22}+P_{31}$		
16		6	20	23	2	0	10	
17		6	20	28		1	2	
18		1	0	2	1	27	26	
19		2	0	1	1	28	27	
20		1	0	2		30	30	x
21		6	21	13		0	0	
22		6	30	20		0	24	
23		7	6	16		0	0	
24		6	6	17	2	0	11	
25		6	1	1		0	5	
26	1	6	6	28	1	1	0	
27		5	30	19	2	31	1	
28		6	21	13		1	1	
29		1	0	0		30	30	x
30		2	0	0		30	31	
31		5	18	26		0	3	

D.L. 5 Track

Card Nos. 14-16 β field

mc	A	NIS	S	D	C	W	T	
		5	0	6		30	30	x
		6	0	5		30	31	
0		6	5	15		0	0	
1		7	6	16		0	22	
2			P_7					
3		5	13	28		0	0	
4		6	13	28		0	0	
5		6	27	19	2	0	1	
6		5	5	17	2	10	13	
7		7	14	30	1	0	11	
8								
9								
10								
11								
12								
13		6	6	13		0	9	
14						P_{22}		
15						P_{22}		
16						$2P_{22}$		
17		5	6	8	1	31	1	
18		6	13	28	1	1	0	
19		5	5	21	2	9	12	
20		5	6	8	2	7	0	
21		5	5	18		2	9	
22		5	18	8		7	9	
23								
24								
25						$2P_{22}$		
26								
27								
28								
29		5	30	21		0	0	
30		$2P_1$	17	0		3	3	
31		7	5	16		29	24	

D.L. Track

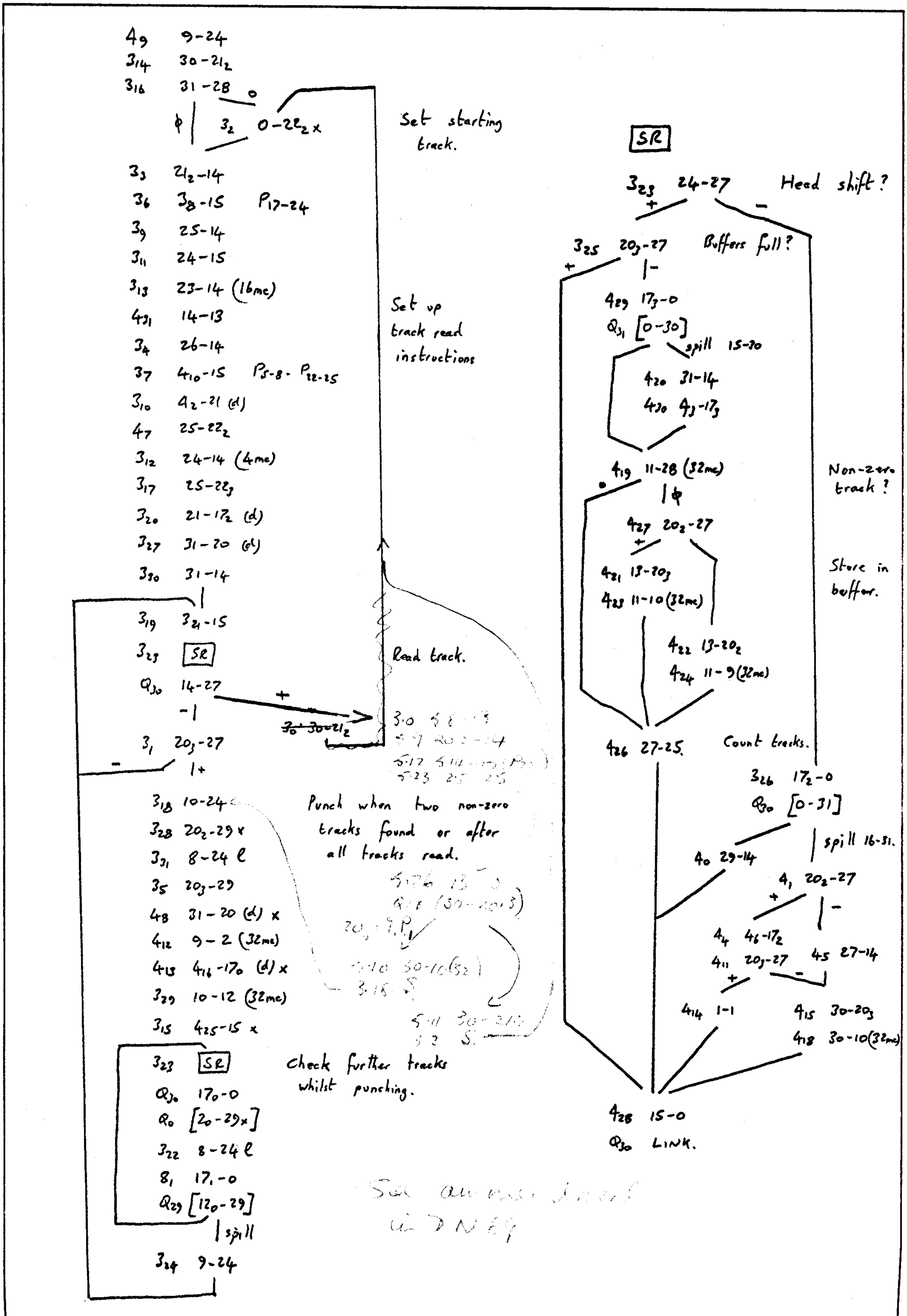
Card Nos.

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

DEUCE Programme No. 495 (ZP29T/3).

Post Mortem (for Mk. I, II or IIA Machines).

Punch Drum.



Post Mortem (for Mk. I, II or IIA Machines).

Punch Drum.

D.L. 3 Track Card Nos. 17-19 α field								D.L. 4 Track Card Nos. 17-19 β field.								D.L. 5 Track Card Nos.							
mc	A	NIS	S	D	C	W	T	mc	A	NIS	S	D	C	W	T	mc	A	NIS	S	D	C	W	T
		7	0	3	1	27	26			4	0	3		30	30	x							
		3	0	4	1	28	27			3	0	4		30	31								
		4	0	3		30	30	x		4	0	4		30	8								
0		3	30	21		0	6		0	4	29	14		0	26		0						
1		3	20	27		0	15		1	4	20	27		1	1		1						
2		3	0	22		0	31	x	2	4	31	30		0 (15)	31		2						
3		3	21	14		1	1		3	4	31	29		0	18		3						
4		3	26	14		0	1		4	4	4	17		0	5		4						
5		4	20	29		0	1		5	4	27	14		0	8		5						
6		3	3	15		0	1		6	4	0	1		0	1		6						
7		3	4	15		1	1		7	3	25	22		1	3		7						
8						P_{17-24}			8	4	31	20	2	0	2	x	8	5	30	20	1	1 (15)	12
9		3	25	14		0	0		9	3	9	24		0	3		9	5	20	14		1	1
10		4	4	21	2	22	27		10		P_{5-8} + P_{22-25}						10	3	30	10	1	7	6
11		3	24	15		0	0		11	4	20	27		0	1		11	3	30	21		1	21
12		3	24	14	1	0	3		12	4	9	2	1	0	31		12	5	5	15		0	9
13		4	23	14	1	1	16		13	3	4	17	2	1	14	x	13						
14		3	30	21		0	0		14	4	1	1		0	12		14						
15		3	4	15		8	6	x	15	4	30	20		0	1		15						
16		3	31	28		0	16		16	3	2	29		29	20	x	16						
17		3	25	22		0	1		17	3	12	29		0 (15)	24		17						
18		3	10	24		0	8		18	4	30	10	1	9	8		18						
19		3	3	15		0	2		19	4	11	28	1	6	5		19						
20		3	21	17	2	0	5		20	4	31	14		0	8		20						
21		3	14	27		0	0		21	4	13	20		0	0		21						
22		8	8	24	1	0	9		22	4	13	20		0	0		22						
23		3	24	27		0	0		23	4	11	10	1	2	1		23	5	25	25		0	1
24		3	9	24		0	25		24	4	11	9	1	1	0		24						
25		4	20	27		0	1		25	$2P_1$	17	0		0	0		25						
26		$4P_1$	17	0	1	2	2		26	4	27	25		0	0		26	0	15	0		0	0
27		3	31	20	2	0	1		27	4	20	27		1	24		27						
28		3	20	29		0	1	x	28	0	15	0		0	0		28						
29		3	10	12	1	17	16		29	$4P_1$	17	0	1	0	0		29						
30		3	31	14		0	19		30	4	4	17		3	19		30						
31		3	8	24	1	0	4		31	3	14	13		0	3		31						