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NELSON RESEARCH LABORATORIES
STAFFORD
MATHEMATICAL PHYSICS LABORATORY.
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Report No. NS t 78
Date 22.9.55.
Reference
Order No.

Front Sheet.
Data Sheet 1.
Figure sheet S6/10222.

DEUCE Subroutine No. 87 (ZO2)

Report by
T.D.Westrup.

SUMMARY.

The attached document gives details of a DEUCE Subroutine for rotating the contents of a delay line by $\pi/2$ in an anticlockwise direction.

The subroutine has been prepared, tested and copied into all instruction delay lines by N.R.L. Staff at Blackheath.

T.D. Westrup.

MATHEMATICAL PHYSICS LABORATORY.

NW

202. ROTATE DISPLAY BY $\pi/2$. DEUCE SUBROUTINE NO.87.

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Sheet No.: 1.

Description. Let A (m,n) be the $P_n$ position in m.c. $A_m$.

$(0 \leqslant m \leqslant 31, \quad 1 \leqslant n \leqslant 32)$

The subroutine transfers

$A\ (m,n) \rightarrow B\ (32-n,\ 1+m)$

for all m, n within the above range.
Thus if display is synchronised with m.c. 0 on the first row the subroutine has the effect of displaying in DLB the contents of DLA rotated by $\pi/2$, anticlockwise.

Data. Pattern to be rotated in DLA.

Result. Pattern, rotated by $\pi/2$, in DL B. $(A \neq B)$

Instructions for Use.

| | | | | | | |
|---|---|---|---|---|---|---|
| Stores Used. | 13 | 14 | 15 | 16 | $21_2$ | $21_3$ |
| Contents at Entry. | Link | - | - | - | - | - |
| Contents at Exit. | $B_0$ | $P_{32}$ | $A_{31}$ | $32\ P_{17}$ | $P_{32}$ | - |

Occupies. m.c's. 10 to 31 inclusive.

Entry. m.c. 23.

Time. 2 seconds, approximately.

Parameters. m.c. 19 add A $P_5$ $(A \neq B)$
m.c. 31 add B $P_{10}$

Waste Instruction. m.c. 11 1 0-0 0 17

Constants available. m.c. 29 0 21-0 1 0 0

D.L 2 Track

Card Nos.

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|---|---|---|---|---|---|---|---|
| | | | | | | | Y |
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| 0 | | | | | | | 2 |
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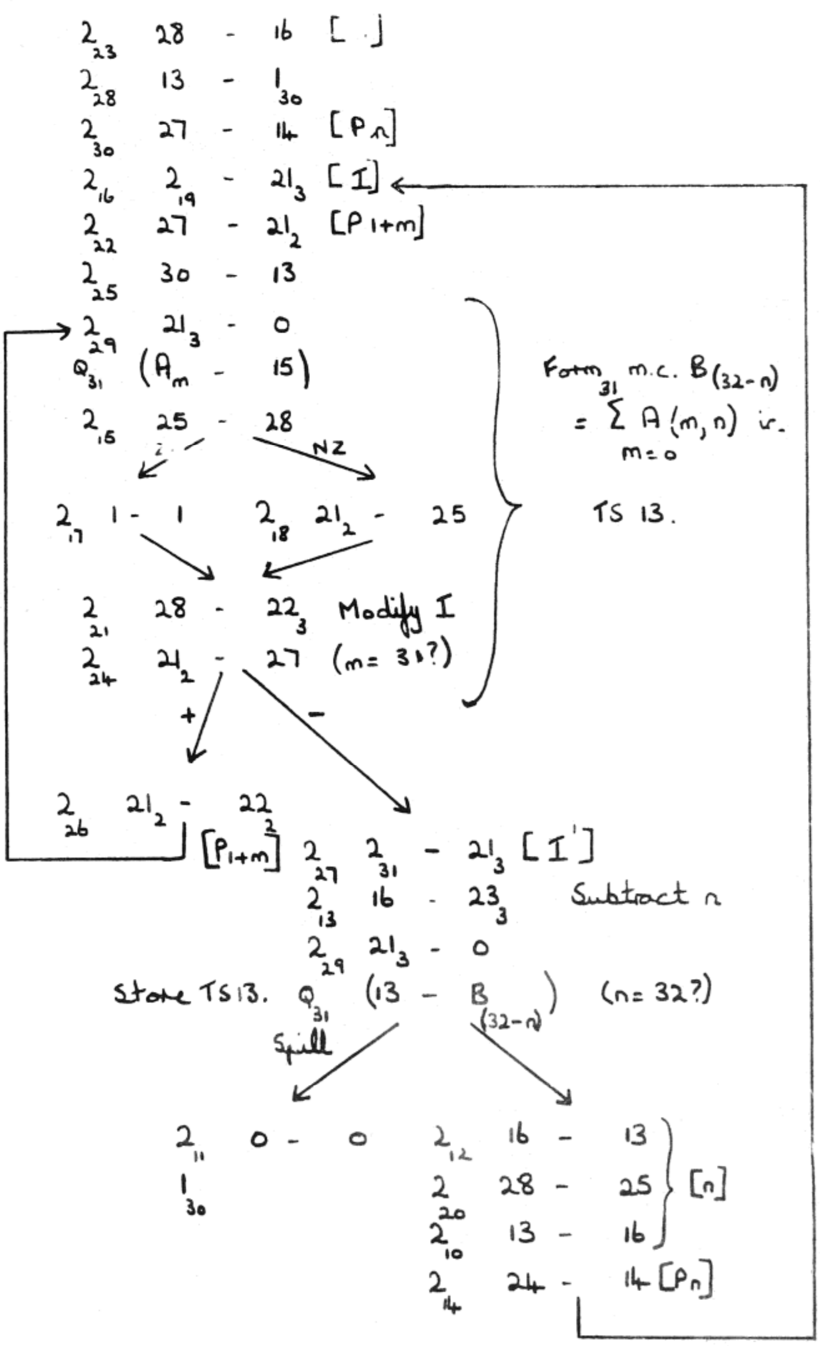
| 2 | | | | | | | 4 |
| 3 | | | | | | | 5 |
| 4 | | | | | | | 6 |
| 5 | | | | | | | 7 |
| 6 | | | | | | | 8 |
| 7 | | | | | | | 9 |
| 8 | | | | | | | Y |
| 9 | | | | | | | X |
| 10 | 2 | 13 | 16 | | 0 | 2 | 0 |
| 11 | 1 | 0 | 0 | | 0 | 17 | 1 |
| 12 | 2 | 16 | 13 | | 0 | 6 | 2 |
| 13 | 2 | 16 | 23 | | 0 | 14 | 3 |
| 14 | 2 | 24 | 14 | | 0 | 0 | 4 |
| 15 | 2 | 25 | 28 | | 0 | 0 | 5 |
| 16 | 2 | 2 | 21 | | 1 | 4 | 6 |
| 17 | 2 | 1 | 1 | | 0 | 2 | 7 |
| 18 | 2 | 21 | 25 | | 0 | 1 | 8 |
| 19 | 2 | A | 15 | | 31 | 14 | 9 |
| 20 | 2 | 28 | 25 | | 0 | 20 | Y |
| 21 | 2 | 28 | 22 | | 0 | 1 | X |
| 22 | 2 | 27 | 21 | | 0 | 1 | 0 |
| 23 | 2 | 28 | 16 | | 0 | 3 | 1 |
| 24 | 2 | 21 | 27 | | 0 | 0 | 2 |
| 25 | 2 | 30 | 13 | | 0 | 2 | 3 |
| 26 | 2 | 21 | 22 | | 0 | 1 | 4 |
| 27 | 2 | 2 | 21 | | 2 | 16 | 5 |
| 28 | 2 | 13 | 1 | | 0 | 0 | 6 |
| 29 | 0 | 21 | 0 | 1 | 0 | 0 | 7 |
| 30 | 2 | 27 | 14 | | 0 | 16 | 8 |
| 31 | 2 | 13 | B | | 31 | 11 | 9 |




FLOW DIAGRAM AND CODING FOR SUBROUTINE No. 87 (202). Rotate Display by π/2.

**Date**

**File Ref.** E.E.

**Sheet Ref.** 56/10222

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