

1. The digit stored in the fifth storage relay set is the fifth digit of an arithmetical order and defines the units relay of the group in which the receiving address is located, or the third digit of a non-arithmetical order and defines:

- (a) the sign for which an examination order is looking;
- (b) if a change of order source is to be conditional;
- (c) the block number for which a tape reader is to search;
- (d) the print layout which is to be selected;
- (e) the shift which is to be selected;
- (f) the type of signal which is to be given to the operator.

2. The  $D_5$  relay set marks out a digit on leads  $D_{51}$  to  $D_{569}$  (numerical values 1 to 0). These markings are routed to the required group of units relays (or equivalent) by the tens relays which  $D_4$  has selected. The units relay which is operated extends the earth over checking contacts to operate DM.

3. If the tens group is a storage group the ten digit leads are carried by connector 8 to the first four storage groups (or by connector 10 to the second four groups if these are added), switched into the correct group by the tens relays SRC and SRB, and operate a units relay SA-SK. The units relay contact 23.22 forwards the earth over break contacts of other units relays, SSC 24.23 and SRC 24.25 to <sup>0</sup> point a common to both racks of stores and hence over GDR, GMD and GRE normal to operate FRS and DM.

4. If the tens group is group "0", selected by the two PT<sup>16</sup> relays and GRG, digit 9 from  $D_{567}$  is routed via GRG 22.23 to operate GRD, GRE and GRF in the lower unit and GRA, GRB and GRC in the upper unit. GMD 4.5 and GRE 29.28 forward the earth to operate FRS and DM.

If the order calls for multiplication or division the address which was specified by the fourth and fifth digits is actually the register address. The accumulator is required to be connected as the genuine receiving address. This is the function of relay which is operated at the same time as EM or ED. Earth from GMD 3.2 operates the GR relays so that the accumulator is connected as receiving store. The normal checking route for the stores and the accumulator are interrupted at GMD 21.22 and <sup>GMD</sup> 4.5 respectively. A new route is established by which earth from the store via GDR 1.2 is connected via GMD 6.5 and GRE 29.28 to operate DM and FRS.

"00" Digit "0" from D<sub>5</sub>69 is routed over GRG 5.6 to operate GDR and is extended over GDR 3.2 to operate DM. GDR performs no other useful function than this; it acknowledges the selection of the "drain" address and lights an indicator lamp.

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5. If the tens group is "0", digits 1, 2, 3 and 4 from D<sub>5</sub>51, 53, 55 and 57 are gated by PT contacts into the P relay sets to operate relays PAX and PAY or PBX and PBY. The marking earth is extended by PAX or PBX 3.2 to operate DM.
  6. For non-arithmetical search orders in which BSA, BSB and BSC have been operated from D<sub>4</sub>, the ten digits leads from D<sub>5</sub> are extended to the five relays BA-BE. Odd digits operate one of these relays and the earth is extended by its contact over BVN normal and hence over the normal contacts of other relays in the group to the previous circuit for operating DM. Even digits also operate one of the relays BA-BE and the earth is first extended by the 25.26 contact of the operated relay to operate BVN and then over BVN 6.5 onto the previous path to operate DM.
  7. For Sign examination and transfer of control orders we have NEX or NCS respectively operated. If NEX is operated the send store sign is recorded on NSP or NSN (see C 47580). Earth from D<sub>5</sub>51 (digit 1) via NEX 5.6 operates NEP if NSN is normal (i.e. if NSP is operated,) or operates NEN if NSN is operated. NEP therefore indicates that the required sign has been found while NEN indicates that the opposite sign has been found. Earth from D<sub>5</sub>53 (digit 2) via NEX records a similar examination for negative sign. After operating NEN or NEP as appropriate the marking earth is forwarded by one (but not both) of these relays operated through a check that only one of the relays NSN and NSP has operated, and via NRC normal onto the previous route to operate DM.
- ✓ If NCS is operated, digit 1 (from D<sub>5</sub>51) calls for unconditional transfer of control and is routed by NCS 5.6 to operate NZ. C 47586 shows that NZ breaks the normal holding circuits for the two L relay sets and reconnects the chains of break contacts in series to operate NRC when all the L relays have released. NRC locks in over NRC 28.29 and disconnects NZ. NZ restores the usual holding circuits for the L relay sets, and at NZ 22.20 extends the marking earth to operate LRA and LRB in both relay sets, and to operate DM over NRC 6.5. When the DM relay in this relay set and in D<sub>4</sub> operates, the circuit (shown on C 47594) is completed to allow the D<sub>2</sub> and D<sub>3</sub> relay sets to mark out the new order source address into L<sub>1</sub> and L<sub>2</sub>.
- If NCS is operated, digit 2 (from D<sub>5</sub>53) calls for conditional transfer of control and is routed via NCS 8.9 to NEP 7.8.9. If NEP is operated this rejoins the previous route. If NEP is not operated the earth appears on the "Order Completed" line at N 5.