1. The first order digit defines the operation which is to be carried out:

| | |
|---|---|
| Digit 1 | Add and hold |
| 2 | Add and clear |
| 3 | Subtract and hold |
| 4 | Subtract and clear |
| 5 | Multiply |
| 6 | Divide |
| 7 | Transfer positive modulus |
| 0 | Non-arithmetical operation specified by next digit. |

2. The leads from $D_1$ digit storage relay set mark out the 1st digit. Earth on the appropriate lead operates a function selection relay and, when this has been checked as found, the "digit" marked out" relay, DM, operates.

3. Earth on $D_1 51$ = Digit 1 operates FA and is extended to DM ae over FA operated and FS and FC released.

Earth on $D_1 53$ = Digit 2 operates FA and FC in series and is extended to DM via FA operated, FS released and FC operated.
Earth on $D_1 55$ = Digit 3 operated FS and is extended to DM over FS operates and FC released.

Earth on $D_1 57$ = Digit 4, operates FA and FC in series and is extended to DM over FS operated and FC operated.

Earth on $D_1 59$ = Digit 5, operates EM, QMA, QMB and GMD in series, and is extended to DM over EM operated and EU, FA, FS and FC normal.

Earth on $D_1$ = Digit 6, operates ED, QDA, QDB and GMD in series and is extended to DM over ED operated and EM, EU, FA, FS and FC normal.

Earth on $D_1 63$ = Digit 7 operates EU and ET in series and is extended to DM over EU operated, F Fc released.

Earth on $D_1 69$ = Digit 0 signals a condition which has already been recognised by NCX and NCY operating and NA and BC and releasing. It is allowed to operate DM over NA normal.

4. In the case of digits 1, 2, 3 and 4 it is necessary to distinguish those additions and subtractions which involve storage locations only, and those which involve a storage location and an input or output organ.

Earth from FA 22 with FA operated and FS released or vice versa is applied to the contacts of various relays in F relay set which recognise these special addresses.

5. The sending address is classified by the operation of:

FSS for a store (see C 47590)
FSA for the accumulator (see C 47590)
FST for the translater (seized if the address is a tape reader)
FSR for the round-off generator (see C 47590)

The receiving address is classified by the operation of:

FRS
FSR for a store, the accumulator or the drain (see C 47588)
FRT for the translator (seized if the address is a printer or perforator)

6. The earth from FA22 operates ET (single transfer) for the following combinations of classification relays:-

FSS and FRS: FSA and FRS: FSR and FRS.

If one of the T-L relays has been operated, by selecting a print layout, ES (transfer to the output) and a T-N and T-M relay in series are operated for the combination FSA or FSS and FRT. VR is operated in parallel with, and at the same time as, FRT.

ER (transfer from input), QRA and QRB are operated in series by the combinations FRS and FST. VSB operates in parallel with, and at the same time as, FST.

7. This diagram C 47592 also shows a related circuit by which the arithmetical operations are further classified into those requiring positive and negative single transfers by operating relay EP or EN respectively. The requirements are:-

| Function relay | Discriminating Feature | Multiple Transfers | Single Transfer |
|---|---|---|---|
| ET | Addition FA<br>Subtraction FS | | Pos.<br>Neg. |
| ET and FRS FSR (round off) | Receive Stores Pos. (FRP)<br>" " Neg. (FRN) | | Pos.<br>Neg. |
| EU | Sending Store Pos. (FSP)<br>" " Neg. (FSN) | | Pos.<br>Neg. |
| ER | Addition (FA) and Sign from tape<br>" Pos. (FSP)<br>Neg. (FSN)<br><br>Subtraction (FS) and Sign from tape<br>" Pos. (FSP)<br>Neg. (FSN) | | Pos.<br>Neg.<br><br>Neg.<br>Pos. |
| ES | Sending Store Pos. (FSP)<br>" " Neg. (FSN) | | Pos.<br>Neg. |
| ENEM | Sending Store Pos. (FSP)<br>" " Neg. (FSN) | Pos.<br>Neg. | None<br>Pos. |
| ED | Send store Pos.(FSP)Acc.Pos. (FAP)<br>" " Neg.(FSN) " Neg. (FAN)<br><br>Send store Pos.(FSP)Acc.Neg. (FAN)<br>" " Neg.(FSN)Acc.Pos. (FAP) | Neg.<br><br>Pos. | Pos.<br><br>Neg. |

It should be noticed that EP or EN cannot operate until a positive or negative sign has been recorded for Send store, receive store and accumulator. Since this is an important stage in setting up the conditions for an arithmetical operation, indicator lamps controlled by EP and EN contacts are provided on E relay set and these should be consulted when investigating an arithmetical fault which has stopped the computer.