1. The secondary sequence diagram C 47593 shows that the counting train AX, AY, AZ is controlled, during the period when AS is operated by earths appearing on the "step on" line. The present diagram shows how earth appearing in sequence on three leads switched by AX, AY and AZ controls the three steps of each cycle of division and signals the completion of each step by earthing the "step on" line.

2. The sequence of operations during a cycle of division is:

   (a) The selection of a shift position, starting with shift A during the first cycle and finishing with shift J during the last cycle.

   (b) The selection of conditions for a multiple transfer of the divisor or its complement, followed by operation of the transfer start relay.

   (c) The selection of conditions for a single transfer of the divisor or its complement, followed by operation of the transfer start relay.

3. When AS operates, the five order digits are marked out and checked and AX operates. At the same time AA in the subsidiary counter is operated. Earth from AS 2.3 via AZ 2.1 - AX 25.26 - ED 24.25 - FAP and FAM both operated or both released - AL 22.21, etc., - AA 22.23 - QDA 2.3 to operate EL and HAX HAY, HAZ. (QDA and QDB operate in series with ED when the first address digit is checked.) When EL and HAX operate, the earth is extended over EL 22.23 - HAX 9.8 - VR 4.3 - VSA 4.3 to the "step on" line.

4. The secondary sequence circuit now operates AY and releases AX. Earth via AX 2.1 - AY 24.25 - ED 4.5 - EL 25.26 - MPD 1.2 - EN or EP operated - ENT 5.4 is switched by EP 21.22.23. If EP is operated, i.e if the divisor and dividend have the same sign, the earth is routed by EP 22.23 - ED 8.9 - EL 2.3 to operate GRO and extended by GRO 26.25 - GLA 7.8 to operate GCA, etc. GCA 9.8 and GF 1.2 complete a circuit to operate GST. The pulse generator now controls a single subtraction and then operates GF so that the earth is returned to the "step on" line.

First Cycle

Similarly if EP was not operated the circuit allows the operation of GRO, checks that GCA, etc. are not operated and operates GST.

5. The above description applies only to the first cycle when EL is operated, and is a special case to ensure that the sign digit of the register (quotient) store is set correctly. During subsequent cycles if EP is operated we have the route for earth from AX 2.1 - AY 24.25 - ED 4.5 - EL 25.24 - FAP 25. If the accumulator (dividend) is positive FAP has been operated (see C 47580) and earth from FAP 26 operates MPD and is extended over MPD 3.2. If the accumulator is negative earth from FAP 24 checks over MPD 1.2 that MPD is normal. The function of MPD is described under "Pulse Generator Control". From MPD 2 earth is routed over EN 8.7 - EP 9.8 - ENT 5.4 - EP 22.23 - ED 8.9 - EL 21 to operate GDP and thence over GDP 3.2 - GRO 24.25 - GLA 7.8 to operate GCA and GST as before. If EP is normal and EN operated we have the alternative route MPD 2 - EN 8.9 - EP 7.8 - ENT 4.5 - EP 22.21 - ED 21.22 - EL 5.4 to operate GDN and thence over GDN 23.22 - GMN 21.22 - GRO 21.22 - GLA 4.5 - GCA 7.8 to operate GST as before. When the appropriate multiple transfers have been completed the earth is returned to the "step on" line.

6. The secondary sequence circuit now operates AZ and releases AY. Earth from AY 2.1 - AZ 25.26 checks MPD 25.23 released and is routed either by EN 25.24 - ED 26.27 to operate GRO and hence GST or by EN 25.26 - ED 28.29 to operate GRO and GCA and hence GST. This transfer is in the opposite sense to the multiple transfers and should return the accumulator to its original sign.

7. When the secondary sequence circuit re-operates AX and releases AZ contacts FAP 21.22.23 and FAM 1.2.3 check that the preset sign of the accumulator (FAM) corresponds with the original sign (FAP). If this check is not satisfied the computer stops and the alarm operates. The condition can then be recognised by the fact that AX and AB are operated and shift A selected.

8. The guard circuits which ensure the correct sequence of operations of GCA, GST and GF are fully described in "Multiplication Control, paragraph 5".

9. The sequence of shift, multiple transfer, single transfer is continued until with AK operated the first step earth is routed over AK 22.23 - QDB 22.23 to the "order completed line".