CHAPTER VI

# THE MONITOR

1. The monitor unit is mounted in bay 1 of the computing cabinet so that its displays are visible, and its controls are accessible, from the desk. It is mounted on runners, and can be withdrawn for servicing. There are two C.R.T. displays: the right-hand display, the programmer's display, will show the content of either the order register or the order-number register. A twin-line timebase is provided, the A-order appearing above the B-order. Binary 'ones' are shown as short vertical lines, and binary 'noughts' as dots. The left-hand display, the engineer's display, can be used for monitoring waveforms at various points in the machine; details are given in Chapter XVII of Volume 2 of the facilities associated with this display. The timebase on the engineer's display can be of the half-word type used on the programmer's display, or it can be varied with coarse and fine controls down to a repetition rate of about 30 m.sec. This tube can be made to show the raw digit-pulse waveform, a series of 'clocked digits' or the so-called 'normal' display used for the programmer's tube.

2. The monitor is provided with a 3$\mu$ sec. trigger pulse to initiate the timebase sweep. This pulse is generated logically as explained in Chapter XVII of Volume 2, and its timing is controlled by the setting of the triggering keys on the programmer's panel and the 'trigger' switch, SW4, on the monitor panel. For use in the programmer's display, and in the engineer's display when the timebase control is set to HALF WORD, the logical circuits generate a 'stop scan' pulse and Y-deflection trigger pulses for raising and lowering the scan to give the twin-trace display. The logical circuits also provide 'scaling' pulses, which have the effect of speeding the timebases at appropriate points to space out the displayed digits into groups corresponding to the coding of a word as an order pair. (fig 6.1).

## TIMEBASE GENERATORS

### Programmer's Display

3. The timebase generator for the programmer's display is shown in fig. 6.1. The timebase generator proper, V37, is connected as a Miller circuit, and is switched through cathode-follower V34*a* by the output of V32. V32 is connected as a monostable relay valve; but it is triggered on the two halves of its cycle by 'start scan' and 'stop scan' pulses. During the flyback period the grid of V32*a* is held at the 'down' level of the 'start scan' waveform (-10V), which is applied through V33*a*; thus V32*a* is cut off and V32*b* is conducting. The grid of V34*a* is then at -20V, and the cathode at about -10V, the grid of the Miller valve being held below cut-off.

4. The 'start scan' pulse causes current in V32 to change over, transmitting a sharp voltage rise to the grid of V34*a*. The cathode of V34*a* then rises to about +40V, cutting