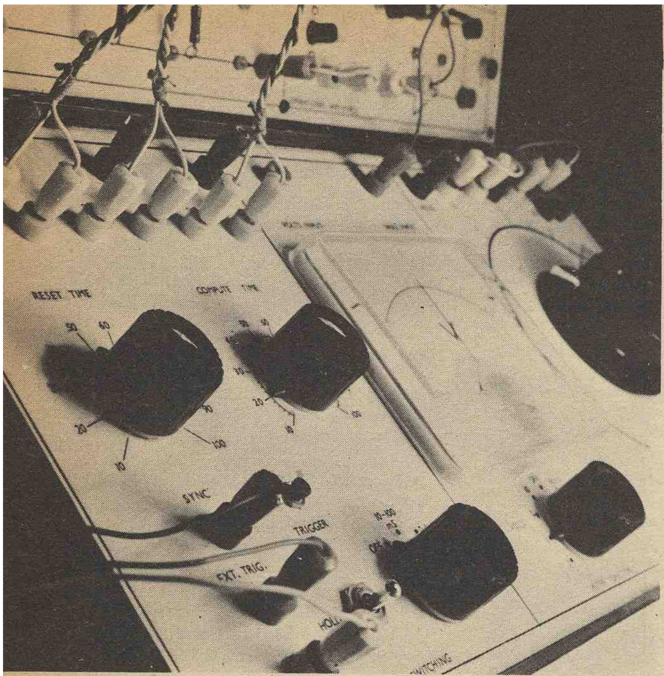

on its blocks, and, following Fig. 6.10 and Fig. 7.3, wire all controls and sockets to the turret tags on the two sub-assembly panels, again with p.v.c. covered flexible wire, long enough to allow the switching circuit panel to be turned over for underside inspection. Run red and blue wires from S9, and a green wire from IS/SK12, to the power pack output solder tags, and fit knobs to S9, VR18, and VR19.

SETTING UP THE INTEGRATOR SWITCH

Time intervals can be measured with fair accuracy when an operational amplifier is employed to integrate known voltages, and this method is useful for setting up the integrator switch.

Begin by temporarily soldering 8μF electrolytic capacitors in the C4 and C8 positions, with 1μF polyester capacitors for C3 and C7 (circuit Fig. 6.10).

Set VR1 and VR2 with sliders at mid-track, on the integrator switch panel.

Connect integrating switch to the operational amplifier by linking IS/SK7 to OA3/SK9, IS/SK8 to OA3/SK10, and IS/SK9 to OA3/SK4. Fit 100 kilohm computing resistor in S3/I1/SK3 and SK4. Join S3/I1/SK1 to VS1/SK2 and switch off S6. Insert a 2 kilohm reset resistor in OA3/SK5 and SK6, and join S3/SK5 to OA3/SK13.

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To complete the construction of UNIT "B", we have now to deal with the integrator switching section, the circuit diagram for which has already been given, see Fig. 6.10.

INTEGRATOR MODE SWITCH ASSEMBLY

Cut and drill the 6¼in × 2½in s.r.b.p. panel shown in Fig 7.1, and rivet turret tags in the positions shown. From six transistors select two with the highest current gain for TR2 and TR5. Mount all components, except range capacitors C3, C4, C7, and C8, on the s.r.b.p. panel and wire up.

Prepare the 3in × 2in relay panel, from Fig. 7.2. Fix turret tags and mount RLA and RLB reed coils. Next, insert miniature diodes D3–D14, with alternating polarities along the row of diodes, and complete underside wiring. To finish off the relay panel, place three reed switches in each coil and secure by soldering the lead out wires to appropriate turret tags.

Wooden blocks are glued to the rear of the UNIT "B" front panel to serve as mounts for switching circuit panel and relay panel (see Fig. 7.3). Note that the relay panel is fitted end-on into slots cut in its mounting blocks, and the switching circuit panel is secured by two woodscrews.

After first attaching lengths of black and white p.v.c. covered multi-strand wire to the terminals of VR18 and VR19, screw the switching circuit panel in position

Switch on the computer and allow a warm up period before zero setting OA3 from the back of the UNIT "A" box, by means of VR1 on the OA3 amplifier panel. Insert a 1μF computing capacitor into OA3/SK11 and SK12.

With S8 switched to "hold", S9 on the 0·1–1s range, and VR18 and VR19 rotated fully clockwise, press S7 to run the integrating amplifier through reset, compute, and hold sequence.

Listen for two clicks from the reed relays, and observe that the readout meter pointer will move close to zero. If the relays click more than twice, or not at all, adjust VR1 on the integrator switch panel.

To obtain a true zero output from the amplifier, when integrating a zero input voltage, adjust VR17 (OA3 balance control) while repeatedly pressing S7. If there is a slow drift away from zero output several seconds after S7 was last pressed, retrim VR1 on the OA3 amplifier panel.

As the gain of OA3 is set at 10 (1μF for C_f and 100 kilohm for R_{in}), an input of $-0{\cdot}9$V "gated" by the integrator switch for an interval of 1s should give rise to an amplifier output of exactly $+9$V. Switch on S6 and adjust VS1 for $-0{\cdot}9$V, monitored at S3/I1/SK2 by a voltmeter.

Now when S7 is pressed, and with VR19 still rotated fully clockwise, the readout meter reading should rise to somewhere below $+9$V and stay there.