A DEVICE FOR THE TIMED PUNCHING OF TAPES FOR PROGRAMMERS¹

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A previous note (Scott, 1964) described a multi-channel tape programmer. The preparation of timed program tapes for this apparatus proved laborious and their accuracy variable. The present apparatus makes accurate timed tapes with a minimum of time and effort. The principle could be applied to any continuous punched tape programming equipment.

Figure 1 is a photograph of the apparatus. The Mylar film is driven by a motor with a clutch-brake (Hurst PC-DA-6, Cost \$13.20), and a sprocket (Simplex 35mm thin tooth) identical to the one used in the programmer (Scott, 1964). A second motor and sprocket, run at the same speed as another programmer, allows double use of the punch assembly. The film being prepared is threaded under the roller (Fig. 1) on the driving side and over

the roller on the stationary side. The connections to the clutch-brake are taken to a decade timer so that the clutch is engaged and the brake released for the time preset. Thus a punching can be made and the time interval until the next punching can be selected and controlled by use of the timer. Slots, where required, are cut with a razor blade between previously punched holes.

The accuracy of the punching is high. A 4-ft length of film made at 6 rpm can be doubled over so that punchings at 10-sec intervals can be compared. Visual inspection reveals no detectable errors in hole alignment. When an electric stop clock was attached to the output of the programmer, a constant error of 250 msec was detected. By suitable setting of the timer this was corrected for, on another length of tape, leaving a variable error of never more than 50 msec.

The ease with which constant errors can be corrected allows a set of corrected timer settings to be achieved where the punch drive

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Fig. 1. Photograph of the punch apparatus.

speed and the programmer speed differ. By use of a faster motor on the punch than used on the programmer the time for making tapes can be further reduced. The punch shown has a 6 rpm and a 30 rpm motor. A tape made at 30 rpm and read by a 6 rpm programmer, in a short test, was satisfactory but displayed proportionally larger errors both constant and variable. Other possibilities include appropriate choice of motor speed and sprocket size so a conversion can be made between the number of sprocket holes between punches and the

time between punches. This would provide an easy visual check on the accuracy of the punch device.

The punch has been used satisfactorily for over a year to prepare programs for the control of apparatus for operant discrimination learning and classical conditioning.

REFERENCES

- Scott, K. G. A programmer for discrimination learning studies. *J. exp. Anal. Behav.*, 1964, 7, 66.