

RM looks at the HORIZON HS 4D

WITH OUR air lanes becoming more and more crowded, there are obvious advantages in "on the field" frequency interchangeability. Currently, opinion seems divided between whether a plug-in crystal or a frequency changeover switching system is "best." The former offers wider choice, but the latter is less subject to human error failures—especially in the simplest part of the operation—changing the frequency pennant! The four-function unit from Horizon Systems, which is the subject of this month's

report, uses a changeover switch system, with an orange/yellow combination. There are five combinations available, starting with brown/red and ending with green/blue. The transmitter has a switch only accessible by removing the back panel, and the receiver has one on the case end, shrouded to prevent accidental operation. Thus a deliberate effort—unscrewing the Tx case back cover and removing the Rx from the model—is necessary to effect a changeover. Even the frequency ribbons have clips that only fit the top section of the

airial, to ensure that they are clearly visible. The outfit is most workmanlike and well thought out. It has an attractively styled transmitter and a small receiver. An integral charging system is incorporated in the transmitter, and a tutor/pupil link is available as an accessory, a changeover button being incorporated as standard on the transmitter face.

TRANSMITTER

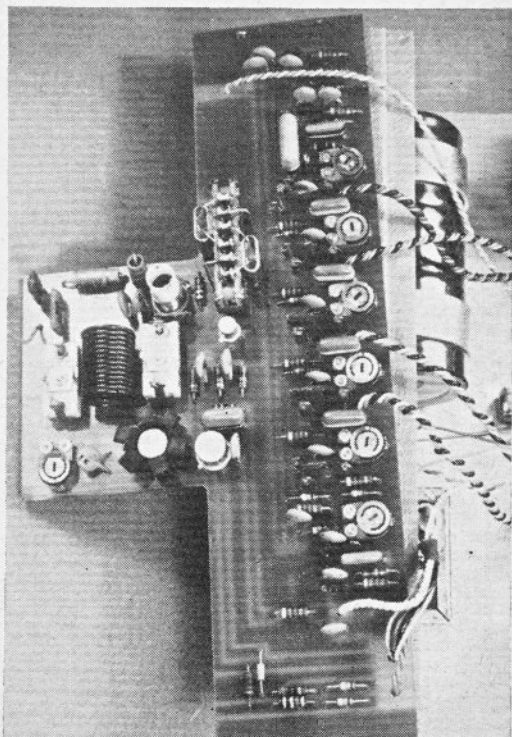
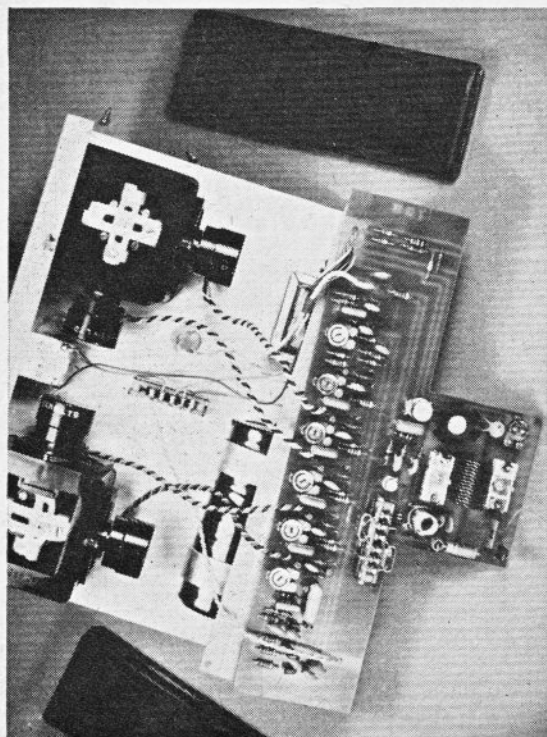
The case is wide and shallow, with the control sticks near the top corners, which gives good balance and comfortable operation. The case is in orange vinyl-clad aluminium, with injection-moulded black plastic end caps. Trim levers are located on the inner sides of the sticks and give electro/mechanical action. The stick mode is easily changed by transferring a clip and friction-screw to the opposite stick unit (the end panels of the case have to be removed for this purpose).

On unscrewing two P.K. screws, the back panel is removable, giving access to the "T" shaped p.c. board and the stick units. Output is indicated on a meter on the front face of the case and a transfer button is located left of centre which, when pressed cuts out the tutor's control and switches in the pupil, who must use a Tx in a similar mode.

Size: 8in. wide x 5½ x 1½in. deep, plus 1½in. stick projection.
Aerial: 54½in., retracts to 8½in. and is removable.
Weight: 2lb. 4½oz.

RECEIVER

The receiver is built on a single ½in. thick, glass-based epoxy p.c. laminate has a double-tuned front-end and a decoder which employs transistors and an i.c. It is enclosed in a strong nylon case and, like the transmitter, is fitted with two crystals, the changeover switch being deeply shrouded to prevent accidental operation. Separate cables serving each servo and the power supply to the receiver are secured with silicon rubber, and



additionally clamped by the case. As with the transmitter, all soldering is neatly done on well spaced lands and the unit is strongly built, yet light in weight.
Size: $2\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$ in.
Harness: each cable 5in.
Weight: 1.95oz.

SERVOS

The outfit uses servos based on the MacGregor M.R. 10 mechanics and has a single board Horizon amplifier soldered direct to the motor. Two of the servos supplied in each outfit operate in reverse sense so that a wide variety of installations is possible, without mechanical linkage problems. In operation these servos give good resolution and plenty of power. There is some slight mechanical float but much of this is cancelled when the system is operating. All the servos are interchangeable in the harness. A complete set of alternative lever output arms is provided.

Size: $1\frac{1}{2}$ in. plus $\frac{1}{4}$ in. lugs each end x $1\frac{1}{8}$ in. plus $\frac{1}{4}$ in. over output arm x $\frac{3}{8}$ in.
Harness: length $5\frac{1}{2}$ in.
Weight: 1.95oz.

Throws: Outer hole (lever) $\frac{1}{4}$ in. plus $\frac{1}{4}$ in. trim. Centre hole (disc outer) $\frac{3}{8}$ in. Inner hole (both lever and disc) $\frac{1}{4}$ in., trims pro rata. No limit stops.

Transit time: 0.7 sec. approx.

Power: over 4 lb. at $\frac{3}{8}$ in. throw (disc outer hole)

POWER PACK

Power supply for the receiver and servos is a cylindrical pack of Ever Ready Ni-cads of the 550mA/H capacity in a nylon case. These are wired direct to a slide switch which feeds either a supply lead to the Rx or a socket for charging. All plugs and sockets are miniature polarised types having gold plated split hollow pins.

Size: $1\frac{1}{8}$ in. dia. x $1\frac{1}{8}$ in. long. Cable exits from end.

Harness: 6in. to switch, 5in. to Rx socket.
Weight: 5.2oz.

CHARGING

The charger is in the Tx case and is of the transformer type. It connects to a mains socket in the base and to a Rx battery charging harness via the pupil/instructor harness socket. The output meter indicates that charging is taking place.

AIRBORNE WEIGHT

Complete model payload: $14\frac{1}{2}$ oz.

MANUFACTURER AND SERVICE CENTRE

Horizon Systems Ltd., Parkhill, Ampthill, Bedfordshire.

