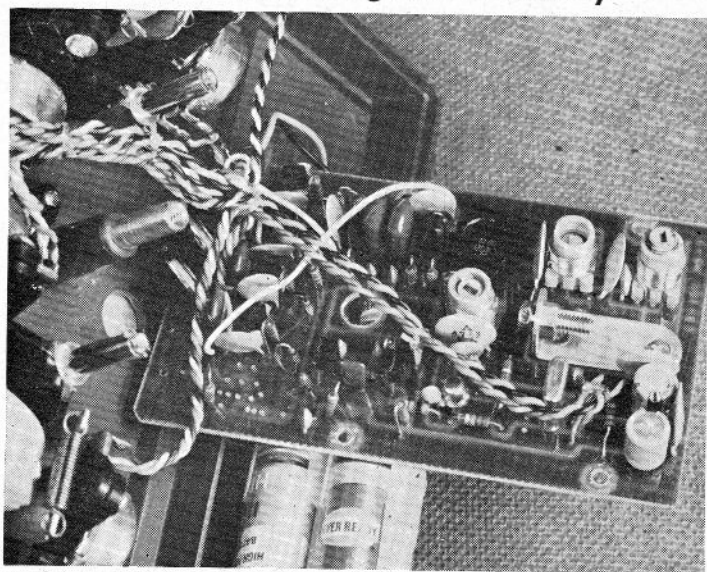




We look at the **G45 SPACE COMMANDER**

Mk II—with Integrated Circuitry



THE Mk II "Space Commander" (like the Mk I!) is an attractively styled system, which now incorporates integrated circuitry in the receiver and servos. Produced in Japan by Micro Inc., and distributed in this country by Harden Associates, it offers crisp fast response to the pilot's commands. It has fixed crystals and can be run on dry batteries to effect an initial price saving, or on available Ni-cads, for which a charging connection is already installed in the transmitter.

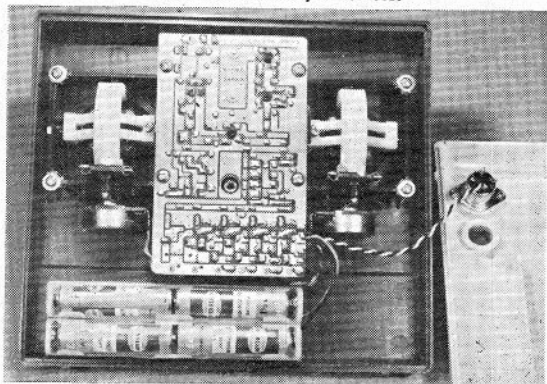
Low price has not prevented the mechanical tolerances of the system from providing smooth feel on the sticks, and practical installation of the servos. The appearance of the transmitter is an interesting departure from the usual "box" type and the servos use three wire differential circuitry and high impedance motors. All the circuits incorporate the voltage control necessary for use with dry batteries.

TRANSMITTER

The case is moulded by an injection process and is in grey and cream, having integral stick wells and a ribbed upper panel, with simulated leather texture on the lower and back areas. Smooth areas are provided for hand-holds to facilitate easy cleaning. The trim controls are situated below and at the inner faces of the sticks, and a recessed on/off switch is positioned centrally. At the top, a meter indicates output. The example on test is in Mode 2 and there is no provision for a single machine screw, but the aerial, which is removable, also helps to retain the



Above: the transmitter p.c. board removed to show component placement. Below: transmitter interior showing p.c. board, stick units and dry batteries.



back. A small printed circuit board carries an all discrete assembly, with space for two further functions. Trim pots are used to set up the servo neutrals during servicing. Eight H.P.7 cells are housed in a battery box, but a multi-pin charging socket is pre-wired to the switch w/c contacts, should one install Ni-cads.

Both stick units are readily accessible and have chromed ball joints in metal sub-housings. The yokes are in hard nylon, carried on interchangeable side plates, and are centred by metal scissors arms and expansion springs. A fine incremental friction lock is incorporated on the throttle. Stick action is very smooth and light. The case balances nicely with the aerial extended and dry batteries in place.

Size: 7 x 6½ in. high x 2 in. deep. Sticks project 1½ in.

Aerial: 56 in. retracts to 12 in.

Weight: (with dry cells) 1 lb. 12 oz.

Stick effort: typically 4.5oz.

RECEIVER

Based on a single p.c. board, the layout is compact without being cramped. The decoding stage uses flat pack in-line i.c.'s and the front end is double tuned. The whole assembly is sprayed with anti-humidity lacquer and the cables exit from the two piece nylon case via rubber grommets.

Size: 2½ x 1½ x ¾ in.

Harness: 5½ in. long.

Weight: 2.1oz.

SERVOS

All servos are now supplied in three wire form, with ⅜ in. dia. high impedance motors, sleeved to fit the well proven mechanics. This and the use of integrated circuit amplifiers, results in weight saving, fast transit and high resolution. The pot is of generous size and secured by a threaded bush and locking nut. Mechanical stops prevent rotation in excess of 160°. The gear train is in four stages and uses nylon spur gears. All those supplied for test are of standard mode. The output discs have multiple drillings for five radii and 30° offset. Double arms are also supplied.

Size: 1 11/16 in. long plus ¾ in. lug each end x 1 1/16 in. plus ¾ in. over disc x 1 1/16 in.

Harness: 8 in.

Weight: 1.6oz.

Throws: max. ¼ in., plus 5/32 in. trim. Min. ¼ in. trim pro-rata.

Power: approx. 3lb.

Transit: approx. 0.6sec.

SERVO TRAYS

Two trays are provided, one for four servos in two pairs and one for one pair, and one transverse servo. They are moulded in nylon and have mounting facilities for the switch. The servos are retained by integrally moulded hooks, and their grommets fit over sets of spigots. The trays themselves are mounted via large rubber grommets, which further contribute to the vibration damping effect.

Sizes: four type—5½ x 2½ in. wide; three type—4½ x 2 1/16 in. wide.

Weights: Four: 0.55oz. Three: 0.47oz.

POWER PACK AND HARNESS

The tes. outfit was fitted with Every Ready M.N. 150 manganese alkaline dry cells, in a black nylon case, the ends of which are visually polarised by the label, and secured by a single machine screw.

The cable goes via a multi-pole slide switch to a male plug. The harness from the receiver terminates in a block connector and aileron servo socket. All are polarised and have round pins and split sockets. The battery plug also fits the block connector, and its position is indicated by a spot.

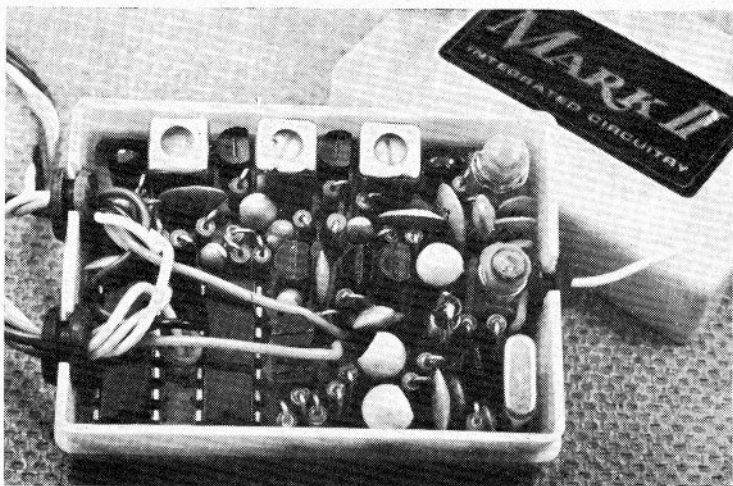
Size: 2½ x 1½ x 1½ in.

Cable: 9 1/4 in. to switch, plus 8 in. to plug.

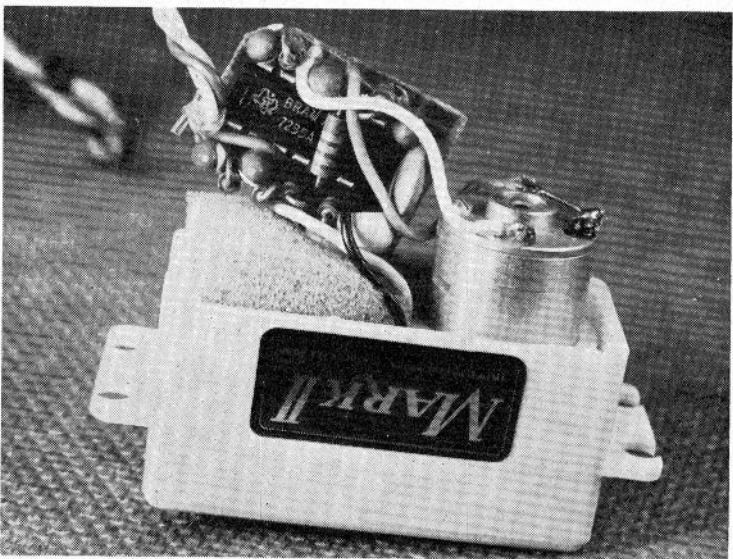
Weight: with M.N. 150 cells; 5oz., with H.P. 7 cells: 4oz.

Installation Weight: 14.4 or 13.4oz. respectively.

Distribution: Harden Associates Ltd., P.O. Box No. 6, Heywood Industrial Estate, Pilsworth Road, Heywood, Lancs.



The one-deck receiver has two flat-pack in-line integrated circuits which may be seen, lower left.



Servo shown here with lower case removed and p.c. board raised to show integrated circuit amplifier. Below is shown four-stage gear train.

