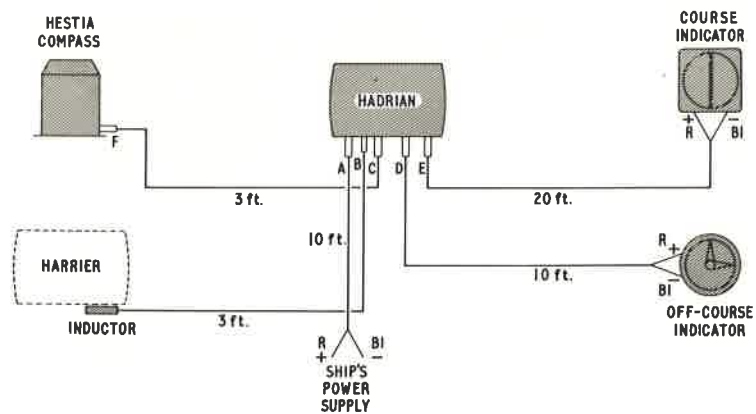


**HADRIAN D.R. COMPUTER
INTERCONNECTION DIAGRAM**



BROOKES & GATEHOUSE LTD.
Bath Road, Lymington, Hants, SO4 9YP, England. Tel. Lymington 4252



**THE HADRIAN AUTOMATIC
D.R. COMPUTER
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THE HADRIAN AUTOMATIC D.R. COMPUTER

(U.K. Patent App. No. 29290/68)

HADRIAN, which operates in conjunction with our Harrier log and Hestia Electronic Compass, provides the navigator with continuous information as to the distance of the vessel from the prescribed course, as set on the dial of Hestia. The ship's position is plotted by laying off on the chart this distance, the distance run and the estimated tidal set. The helmsman can periodically be given a fresh compass bearing which will slowly bring the vessel back on to the prescribed line. The sensitivity of the computer is such that course errors as small as 20 yards can readily be observed.

The Principle of Operation

Conventional dead reckoning involves observing the ship's mean heading and distance run over short intervals of time and laying off on the chart the course made good during each interval. When, due to sea and wind conditions, the heading and speed have large variations, correspondingly large errors in the D.R. position may occur unless the intervals are made short. HADRIAN automatically samples the heading error as given by Hestia every 20 yards of distance travelled (as defined by Harrier) and records on a dial the corresponding distance travelled at right angles to the set course. The dial pointer, which was set to zero at the point of departure, accumulates all these increments of course error enabling the distance from the desired course to be read off at any time. Two pointers are, in fact, fitted; one (white) makes a full revolution for every mile, and the other (red) one revolution for every 100 miles of course error. Indication of whether the error is to the left or right is given at all times by the red pointer.

Description of the Equipment

The electronic circuits of the computer which embody 36 transistors, are housed in one of our standard die-cast, sealed cases measuring $8\frac{1}{4}'' \times 4\frac{7}{8}'' \times 3\frac{3}{8}''$. Power is obtained from the ship's 12, 24, 32 or 36 volt D.C. main from which a current of only 0.1 amp. is drawn. Cables are provided also for connection to the Harrier log and the Hestia Compass Unit, and to the indicator. The dial of the indicator is $3''$ (7.6 cm.) in diameter. It is $4\frac{1}{2}''$ (11.4 cm.) deep from front to back and is designed for bulkhead mounting. It is not hermetically sealed and should therefore be installed in a protected position. To simplify the installation and reduce the number of "boxes" the electronic circuits of the Hestia have been incorporated in the case of HADRIAN. The Hestia control box therefore becomes redundant and may be "traded in" to Brookes & Gatehouse Limited when HADRIAN is ordered. No modification to HARRIER is necessary since the signal from the log is derived by means of a magnetic pick-up coil which is fixed to the bulkhead beneath the instrument case.

Example of Use

On departure from the Needles Channel for Cherbourg the required course of 187° mag. is set on the dial of the Hestia Compass. After sailing 40.00 miles by log, it is decided to obtain the position by D.R. in order to make any necessary adjustment to course in preparation for landfall. The dial of HADRIAN indicates 3.37 miles off-course, to the right. The estimated tidal set since departure is 2.5 miles/ 260° mag. Draw a line on the chart parallel to the rhumb-line (187° mag.) and 3.37 miles distant from it, on the westward or right-hand side of it, when facing the destination. Set the dividers to 40.0 miles and with one point of them at the Needles strike an arc to cut the above line. The intersection is where the ship would have been in the absence of tidal current. Allowing for tidal set, mark the D.R. position at 2.5 miles in direction 260° mag. from this point.

The instrument is particularly useful in windward sailing, when the wind-shifts cause frequent changes in heading and manual dead reckoning inevitably becomes inaccurate. Hestia may permanently be left set to the required windward course to be made good and the distance of the yacht from this course-line will continue to be recorded, no matter by how large an angle the yacht may be headed away from it.

SPECIFICATION

Weights

Control Unit :	4 lb. (1.8 kg.)
Indicator :	2 lb. (0.9 kg.)

Sizes

Control Unit :	$8\frac{1}{4}'' \times 4\frac{7}{8}'' \times 3\frac{3}{8}''$ (21.0 × 12.4 × 8.6 cm.)
Indicator :	Face diameter 3'' (7.6 cm.)
	Bezel diameter $4\frac{1}{4}''$ (10.7 cm.)
	Barrel diameter $3\frac{1}{4}''$ (8.2 cm.)
	Depth $3\frac{1}{2}''$ (8.9 cm.)

"Safe" distance of distance-off-course indicator from HESTIA or other magnetic compass (subject to fitting of mumetal magnetic screen supplied with the indicator) 18" (46 cm.). Later models will have a mumetal magnetic screen fitted inside the indicator.

Accuracy

Dependent on calibration of Harrier and Hestia. If these are within 2% and 1° respectively the fixing error will not exceed 180 ft. per mile sailed (neglecting errors in tidal and leeway allowances).

Power Supply

Ship's D.C. main at 12, 24, 32 or 36 volts.
Current drain 0.1 amp. approximately.

HADRIAN IS FULLY GUARANTEED FOR THREE YEARS



(Diagrams Overleaf)