QM5
QM9
QM10

RECEIVER OUTFITS QM5, QM9 AND QM10

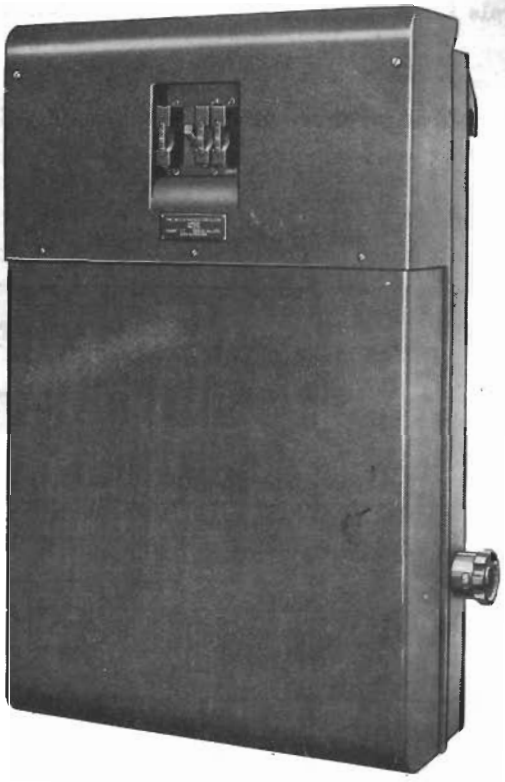
SUMMARY OF DATA

PURPOSE

A Navigational Aid using the Decca Navigator System.

GENERAL DESCRIPTION

The Decca Navigator System is a system of a navigation using as its basis the geometry of the hyperbola. This principle is derived from the fact that between any two fixed points, a series of lines may be drawn which have the property that at any point of each line, the difference in the distance between any two fixed points has the same value. The lines thus formed take the form of hyperbolic curves. The distance difference between the Receiver and two fixed Transmitting Stations some distance apart was the measurement used in earlier navigational aids such as Gee and Loran.



RECEIVER B54

The Decca system is, however, somewhat different; it consists of a number of groups or chains of transmitting stations. Each chain consists of four stations - a master and three slaves (known as the purple, red and green slaves respectively). The approved range of the system is approximately 240 nautical miles radius from the master station so that a series of chains could give continuous coverage. All the stations radiate C.W., each on a prescribed frequency. The four frequencies are harmonically related to a common fundamental frequency and the phase of each slave's transmission is controlled at all times, by the master transmission. The chain should be regarded as three pairs of stations, each pair consisting of the Master and one Slave.

The radio waves sent out by the Master and each Slave station are converted in four separate channels in the receiver to a common frequency and their phase relationships are compared. This comparison of phase achieves a similar but more accurate result than that of difference distance measurement already discussed. Each phase change of 360^0 produces a separate lane, a fixed number of lanes (different for each pair) constituting a zone. The width of these lanes varies greatly from 400 - 600 yards on the base line to 3 miles at the edge of the coverage.

In Outfits QM5/9/10 a system of lane identification has been introduced so that a continuous check may be kept of lane numbers.

Outfit QM9 is a 9 chain version of QM5. Provision has been made for fitting nine crystals and certain circuit changes have been made to improve performance and utilise preferred components.

Outfit QM10 is similar to QM9, but also incorporates a "freezing circuit" to prevent jitter of the decometer pointers during Lane Identification. It also has provision for use with supply voltages from 85 to 240V, 40-60 c/s.

The nine chains are:-

Chain 1	S.W. British. Master Station at Kingsbridge in Devon
Chain 2	Not in use at present
Chain 3	N. British. Master Station at Kirkudbright in Scotland
Chain 4	Swedish. Master Station at Nynasham
Chain 5	English. Master Station at Puckeridge, 18 miles North of London
Chain 6	North Scottish. Master Station at Kirkwall
Chain 7	Danish. Master Station on Island of Samso
Chain 8	French. (For aircraft use only.) Master Station at Montelesson
Chain 9	German. Master Station at Brielen

INDICATOR UNIT DES. 6

FREQUENCIES (kc/s)

CHANNEL	CHAIN 1	CHAIN 2	CHAIN 3	CHAIN 4	CHAIN 5	CHAIN 6	CHAIN 7	CHAIN 8	CHAIN 9
Black (Master)	84.280	84.460	84.645	84.825	85.000	85.180	85.365	85.545	85.720
Red Slave	112.373	112.6133	112.860	113.100	113.333	113.5733	113.820	114.060	114.293
Green Slave	126.420	126.690	126.968	127.2375	127.500	127.770	128.048	128.318	128.580
Purple Slave	70.233	70.3833	70.537	70.6875	70.833	70.9833	71.137	71.288	71.433

POWER REQUIREMENTS

230 volts 50 c/s at 250 watts. (QM10 85 to 240V, 40-60 c/s).

MAJOR UNITS

Outfit QM5

Pattern No.	DESCRIPTION	PHYSICAL DATA		
		Height	Width	Depth
66732	Receiver B54	2' 10"	1' 8"	10½"
66733	Indicator Unit Design 6	1' 2"	1' 5½"	1' 1"

Outfit QM9

Pattern No.	DESCRIPTION	PHYSICAL DATA		
		Height	Width	Depth
101420	Receiver (Decca Navigator Marine Model MK. VM Type 133, 9 Chain)	2' 10"	1' 8"	10½"
101421	Decometer, Display-Unit (Decca Marine Model Mk. VM) Type 134 - 9 Chain	1' 2"	1' 5½"	1' 1"

Outfit QM10

Pattern No.	DESCRIPTION	PHYSICAL DATA		
		Height	Width	Depth
102443	Receiver (Decca Navigator Marine Model Mk. VM) Type 133, 9 Chain	2' 10"	1' 8"	10½"
102444	Decometer Display Unit (Decca Marine Model Mk. VM) Type 134, 9 Chain	1' 2"	1' 5½"	1' 1"

Total Weight of Outfit QM5/9/10 - 127 lb (Approx.)

POWER SUPPLY OUTFITS

A.C. Supply Outfit DQB when no suitable power supply is available.

AERIAL

The aerial consists of Patt. 611A Insulated Cable approximately 30 feet in length and a special concentric feeder. Whip Aerial Outfit AWM is fitted on small ships where a 30 ft aerial cannot be supported.

HANDBOOK

B.R.2017(1)(2)

ESTABLISHMENT LIST

E.1000

INSTALLATION SPECIFICATION

B.686