

CHAPTER 6

603

NAVAIDS AND BEACONS

1.

GENERAL

(a) Shipborne Requirements

	<u>Where</u>	<u>Accuracy</u>	<u>Time to Fix</u>
(i)	Mid-ocean	Fair	Long 5 - 15 minutes
(ii)	Coastal	Good	Medium up to 5 minutes
(iii)	Inshore and harbour	Very Good	Quick 1 minute. (Instantaneous)

(b) Equipment available for above

- (i) Loran and Consol (Sonnet)
- (ii) Decca and Gee
- (iii) Decca

LORAN(a) General

Long range navigation. Fulfils requirements of 1 (a) (i). Synchronised pulses are broadcast from pairs of shore stations, time difference in reception gives a position line, two pairs are required for a fix. Special charts or tables (U.S.N. only) and a special receiver is required in the ship.

(b) Capabilities(i) Identification

Each pair can be identified by:-

Frequency Channel. One of four:-

1. 1950 kcs
2. 1850 kcs
3. 1900 kcs
4. 1750 kcs (Not official)

Basic P.R.R.
(Pulse Repetition Rate)

- L. 25 c/s
H. $33\frac{1}{3}$ c/s

Specific P.R.R.

8 specific multiples of each basic P.R.R. - Station selection - (unwanted stations drift across CRT).

- (ii) Range Groundwave. 600-700 miles by day, less by night.
 Skywave. 1200-1400 miles usually at night only.

(iii) Accuracy

+ 1% of the range from the transmitter. There are special corrections for skywaves - NEVER use a "Blinking" signal.

(iv) Naval Model

Is DAS-2 (200 obs) which requires a 30 ft. aerial and 230v 50 c/s AC power supplies.

(v) Coverage

North Atlantic
Indian Ocean - Bay of Bengal
Pacific

(vi) S.S. Loran (Being Developed)

Uses synchronised skywaves: gives accurate fixing in a specific area of approximately 1000 miles square.

(vii) Where Fitted

Fitted in all H.M. Ships operating in Loran areas.

3.

CONSCL (SONNE)(a) General

A German device which fulfils part of requirement of 1 (a) (i). An MF W/T transmitter, with a directional aerial system, gives coverage of 2 sectors of 120 degrees approximately. Only shipborne requirement is an ordinary MF receiver.

(b) Capabilities(i) Identification

Call sign of station and frequency.

Signals consist of long dash followed by a series of 60 dots and dashes with an equi-signal at the changeover. e.g.,

.....F.....equi-signal-----

Number of dots and dashes to make 60 gives the bearing.

(ii) Range

1000 miles by day, greater by night, but hampered by noise.

(iii) Accuracy

Day. ± 0.2 to ± 0.5 degrees.

Night. ± 0.2 to ± 1.5 degrees or worse.

Errors are at a maximum at a distance of between 350 and 450 miles from the transmitter at night.

(iv) Special charts or tables are required.

(v) Coverage

North Atlantic -- 4 stations:-

Stavanger.

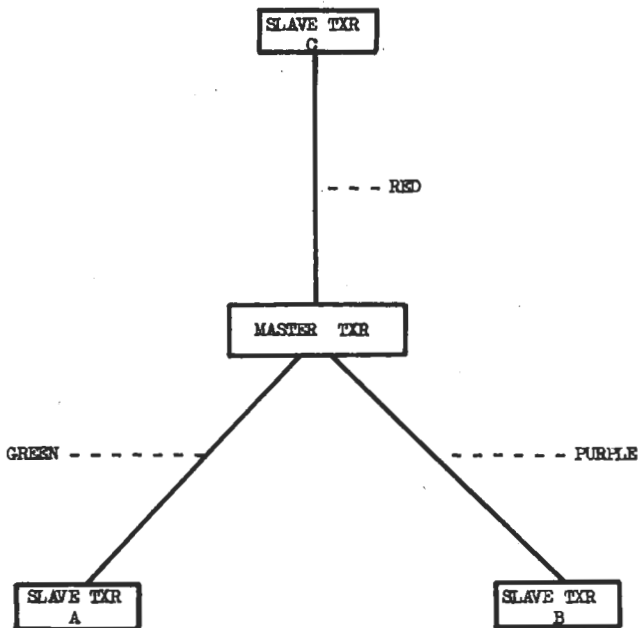
Bushmills.

Lugo.

Sovillo.

(a) General

British. Coastal and harbour fixing device. Fulfils requirements of 1 (a) (ii) and (iii). It is an LF device, working on phase comparison. By means of a special receiver it gives immediate identification of position by meters whose readings can be plotted on "latticed charts" - i.e. immediate fix. Each area is covered by a "chain". The main difficulty is lane identification.



Once set up can give continuous tracking readings.

(b) Capabilities

- (i) Identification of Chains Switched system - otherwise automatic.
- (ii) Accuracy

<u>Range from Master</u>	<u>Night</u>	<u>Day</u>
50 miles	1/2 cable	1/2 cable
100 miles	2 cables	1 cable
200 miles	5 cables	2 cables
- (iv) Naval Models Q M 3, later Q M 5.
- (v) Coverage British Isles and Danish waters.
- (vi) Where Fitted In H.M. Ships in Home waters in order of precedence:-

- Rescue Ships
- Survey ships
- Small ships
- Local squadrons
- Home Fleet.

To be returned on proceeding to Foreign stations.

NAVALS AND BEACONS

5.

GEE - QH(a) R.A.F. War Device - V H F

Works on similar principle to Loran but each chain having a Master and two or three Slaves 80 miles apart. It fulfils requirements in 1 (a) (ii).

(b) Capabilities(i) Identification

Switched chains.

(ii) RangeAircraft 450 miles.
Ships 150 miles.(iii) Accuracy

100 yards upwards.

(iv) Naval Models

Q H 3.

(v) Coverage

South British Isles.

(vi) Where Fitted

In some H.M. Ships in HOME waters.
Slowly being landed and returned.
To be returned on proceeding to Foreign station.

General

A U.S. designed beacon fitted in all carriers, except "Indefatigable", and in some cruisers. Basically it consists of a UHF transmitter with a rotating and highly directional aerial. It requires a special receiver in the aircraft.

Features

- (i) Frequency 246 mcs, modulated at one of the following:..
1. 660 kcs
 2. 690 kcs
 3. 720 kcs
 4. 750 kcs
 5. 780 kcs
 6. 810 kcs
- (ii) Power Supplies 220v DC.
- (iii) Range Approximately 10 miles for every 1000 ft. of aircraft height with a maximum of 100 - 120 miles.
- (iv) Sectors 12 lettered sectors. The aerial rotates every 30 seconds, transmitting each sector letter twice per revolution. Every 5 minutes, identity code letters are transmitted for one revolution instead of the sector letters.
- (v) Further details are found in A F O "S" 4.
- (vi) The aircraft adjusts the receiver gain to hear 4 letters only e.g. A B B C indicates that the aircraft is in sector B.

Y G BEACONGeneral

Similar in design to the Y E but is of less power and is fitted in Naval Air Stations.