

- Pilot Plans are essential when negotiating a passage close to hazards, or when entering a harbour or estuary.
- A successful plan will impose firm control over your passage. You may not need to know exactly where you are but you must be confident that you are not running into danger.
- A good plan will not be time dependent and should, therefore, allow for any tidal movement, lack of visibility and lack of daylight.
- Plans can be made well ahead of time and be stored for future use.

- A good pilot plan will draw on several different sources of reference to confirm that you are where you expect to be.
- Those references will include: Buoyage, Sector Lights, Light Houses and Leading Lights, Transits, Waypoints, Leading Bearings, Back Bearings, Clearing Bearings plus Depth of Water.
- When using buoyage remember that Buoys are for passing rather than to be 'aimed at'.
- Don't rely on a chart plotter as your only reference. Horizontal dilution of the position might put you 30 metres from the position shown, enough to have have you navigate out of the narrow channel that you expect to be in.

- A CLEARING BEARING is a limit to navigation that we can impose on our pilot plan.
- The clearing line shown opposite has a bearing of 70 degrees when pointed at the light house on Hurst Point.
- It has been drawn deliberately to keep the boat approaching Hurst Point off of the dangerous 'Shingles Bank'.
- As long as the boat approaches Hurst Point with a 'bearing to the light house' of more than 70 degrees then the boat cannot hit the shallow bank.



- A LEADING BEARING is a line that we want to follow across the ground.
- Our navigator has chosen a line that runs midway between Hurst point and the NE Shingles Buoy, and is aimed at the conspicuous Fort Albert.
- The current is first positive and then across the line, so the helm has to steer the boat progressively more to starboard to keep the bearing of 100 degrees on Fort Albert.
- Note the significant change in depth as the boat reaches the Needles Channel.



- If there isn't an obvious target up ahead, there might well be one behind. In which case you can use a BACK BEARING.
- In this case our navigator has chosen a back bearing of 230 degrees on the NE Shingles buoy to keep him on the straight and narrow.
- Looking over your shoulder will make the correcting 'turn' harder to select so pre-plan. In this case, if the bearing increases the helmsman should turn left to put the boat back on line and vice versa.



- Many harbour entrances and river estuaries are marked by Directional Lights or Transits. Particularly those effected by cross tides or currents.
- They will conspicuous by day, so that they can be used with a leading bearing and lit at night.
- The two sectored lights shown opposite project coloured beams along the major reaches of the channel.
- Using the coloured sectors you can navigate with precision along the centre-line, the starboard side or the port side of the channel.



- If we are going to use navigational lights then we need to be able to recognise the various different light phases.
- Opposite is an extract of chart 5011 describing the various phases and timings.
- I describe a FIXED (F) light as one that is on all of the time.
- Whereas a FLASH (Fl) is an instant of light in a period of dark.
- An OCCULT (Oc) is an instant of dark in a period of light.
- And an ISOPHASE (iso) light has equal periods of light and dark.

| CLASS OF LIGHT | International abbreviations | Illustration Period shown |
|--|---------------------------------------|------------------------------|
| FIXED | F | |
| OCCULTING (total duration of light lon Single occulting | ger than dark) Oc | |
| Group occulting e.g. | Oc(2) | |
| Composite group-occulting e.g. | Oc(2+3) | |
| ISOPHASE (light and dark equal) | Iso | |
| FLASHING (total duration of light short Single-flashing | er than dark) Fi | |
| Long-flashing (flash 2s or longer) | LFI | |
| Group-flashing | FI(3) | |
| Composite group-flashing e.g. | FI(2+1) | |
| QUICK (50 to 79, usually either 50 or 6 Continuous quick | 0, flashes per minute) | |
| Group Quick e.g. | Q(3) | |
| Interrupted quick | la | |
| VERY QUICK (80 to 159, usually either Continuous very quick | 100 or 120, flashes per minute) VQ | |
| Group very quick e.g. | VQ(3) | 444 444 444 444 |
| Interrupted very quick | IVQ | |
| JLTRA QUICK (160 or more, usually 2- Continuous ultra quick | 40 to 300, flashes per minute) UQ | |
| Interrupted ultra quick | IUQ | |
| MORSE CODE e.g. | Mo(K) | |
| IXED AND FLASHING | FFI | |
| e.g. | AI WR | |

Any charted feature that is 'lit' will have a magenta coloured 'teardrop' next to the feature. Opposite we have an 'Offshore Installation', probably an oil rig and a Major Light or Light House.

The lighthouse on Hurst Point opposite is described as; Flashing in groups of four, every fifteen seconds. White or Red depending on the direction that you see it from, with a height of twenty three metres. It also has a second directional light nineteen metres high that shows as an Isophase, four seconds, in red white or green.





Here is a Pilot Plan for entry into Blackmill Marina

1 – 2. Stay between clearing bearings of
244 and 254 on Gremlin Head
lighthouse. Fl 3s.

2 – 3. Head towards the Fairway buoy on a Leading Bearing of 190. Iso 5s.

3 – 4. Head towards Directional light in
White or green sectors, Oc 5s. Aprx
bearing 135. Turn aprx 1 cable after road
bridge. 0.7 miles total.

4 – 5. Head towards Directional light, Oc 10s, in white or green sectors, aprx bearing 195. Turn aprx 2 cables after cable crossings. 0.5 miles total

5 – Marina. Towards Iso 4s Green Transit lights, aprx bearing 135, 0.5 miles



- This navigator has entered a series of waypoints at the major turning points into his GPS.
- He must conduct a 'gross error check' to ensure that the input is correct.
- He must also draw the route on a paper chart to ensure that the lines between waypoint are safe to follow.
- Following constant bearings to the waypoints will back up the visual references to Buoyage, the marked transits and depth. Allowing the plan to work when visibility is reduced.



- When we see a light on the horizon, it can be said that the light is 'rising' if you are closing with it or 'dipping' if you moving away.
- You can find a 'Dipping Distance Table ' like the one shown here in many almanacs.
- To use the table compare your estimate of the height of your eye above the waters surface with the height of the Light given on your chart. The result is your distance away from the light.
- Combine that distance with the bearing to the light to give you a fix.

| Heir | abt of | | | | | | Height | of eve | | | | | |
|--------|--------|--------|------|------|------|------|--------|--------|------|------|------|------|--|
| lig | ght | metres | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| metres | feet | feet | 3 | 7 | 10 | 13 | 16 | 20 | 23 | 26 | 30 | 33 | |
| | | | | 0.5 | | 10.0 | 11.0 | 11.7 | 12.1 | 10.5 | 12.0 | 12.2 | |
| 10 | 33 | | 8.7 | 8.5 | 10-2 | 10-8 | 11.3 | 11-7 | 12.1 | 12.5 | 12.0 | 13.2 | |
| 12 | 39 | | 9.3 | 10-1 | 10-8 | 11-4 | 11.9 | 12.3 | 12-7 | 13-1 | 13.4 | 13.0 | |
| 14 | 46 | | 9.9 | 10.7 | 11.4 | 12.0 | 12.5 | 12.9 | 13-3 | 13-7 | 14-0 | 14.4 | |
| 16 | 53 | | 10-4 | 11.2 | 11.9 | 12-5 | 13-0 | 13-4 | 13-8 | 14.2 | 14-5 | 14.9 | |
| 18 | 59 | | 10.9 | 11.7 | 12.4 | 13-0 | 13.5 | 13.9 | 14-3 | 14.7 | 15-0 | 15-4 | |
| 20 | 66 | | 11.4 | 10.0 | 12.0 | 12.6 | 14.0 | 14.4 | 14.8 | 15.2 | 15.5 | 15.9 | |
| 20 | 00 | | 11.4 | 12.2 | 12.5 | 14.0 | 14-0 | 14.9 | 15.3 | 15.7 | 16.0 | 16.4 | |
| 22 | 12 | | 11.9 | 12.7 | 13.4 | 14-0 | 14.0 | 15.2 | 15.5 | 16.1 | 16.4 | 17.0 | |
| 24 | 79 | | 12.3 | 13-1 | 13.8 | 14-4 | 14-9 | 15.5 | 16.1 | 16.5 | 16.8 | 17.2 | |
| 26 | 85 | | 12.7 | 13.5 | 14-2 | 14-0 | 10-3 | 16.1 | 16 5 | 16.0 | 17.2 | 17.6 | |
| 28 | 92 | | 13-1 | 13.8 | 14.0 | 10.7 | 15-7 | 10-1 | 10.5 | 10.9 | 17.2 | 17-0 | |
| 30 | 98 | | 13.5 | 14.3 | 15.0 | 15-6 | 16-1 | 16-5 | 16-9 | 17.3 | 17.6 | 18-0 | |
| 32 | 105 | | 13.9 | 14.7 | 15.4 | 16.0 | 16-5 | 16-9 | 17-3 | 17.7 | 18-0 | 18-4 | |
| 34 | 112 | | 14.2 | 15.0 | 15.7 | 16.3 | 16-8 | 17.2 | 17.6 | 18-0 | 18-3 | 18.7 | |
| 36 | 118 | | 14.6 | 15.4 | 16-1 | 16.7 | 17.2 | 17.6 | 18.0 | 18-4 | 18.7 | 19-1 | |
| 38 | 125 | | 14.9 | 15.7 | 16.4 | 17-0 | 17.5 | 17.9 | 18.3 | 18.7 | 19.0 | 19-4 | |
| 50 | 120 | | 14.0 | 107 | 104 | | | | | | | | |
| 40 | 131 | | 15.3 | 16-1 | 16-8 | 17-4 | 17.9 | 18-3 | 18.7 | 19-1 | 19.4 | 19-8 | |
| 42 | 138 | | 15-6 | 16-4 | 17.1 | 17.7 | 18-2 | 18-6 | 19-0 | 19-4 | 19.7 | 20-1 | |
| 44 | 144 | | 15.9 | 16.7 | 17-4 | 18-0 | 18-5 | 18-9 | 19-3 | 19.7 | 20-0 | 20.4 | |
| 46 | 151 | | 16-2 | 17-0 | 17-7 | 18.3 | 18-8 | 19.2 | 19-6 | 20.0 | 20.3 | 20.7 | |
| 48 | 157 | | 16-5 | 17.3 | 18.0 | 18-6 | 19-1 | 19-5 | 19-9 | 20.3 | 20.6 | 21.0 | |
| 50 | 101 | | 10.0 | 17.0 | 10.0 | 10.0 | 10.4 | 10.9 | 20.2 | 20.6 | 20.0 | 21.2 | |
| 50 | 164 | | 10-8 | 17-6 | 18-3 | 18.9 | 19-4 | 19-8 | 20.2 | 20.0 | 20.9 | 21.3 | |
| 55 | 180 | | 17.5 | 18-3 | 19-0 | 19-6 | 20.1 | 20.5 | 20.9 | 21.3 | 21.0 | 22.0 | |
| 60 | 197 | | 18.2 | 19-0 | 19.7 | 20-3 | 20-8 | 21-2 | 21.6 | 22.0 | 22.3 | 22.1 | |
| 65 | 213 | | 18-9 | 19.7 | 20-4 | 21-0 | 21-5 | 21.9 | 22-3 | 22.7 | 23.0 | 23.4 | |
| 70 | 230 | | 19-5 | 20-3 | 21.0 | 21-6 | 22-1 | 22.5 | 22.9 | 23-2 | 23.6 | 24-0 | |
| 75 | 246 | | 20.1 | 20.9 | 21.6 | 22.2 | 22.7 | 23.1 | 23-5 | 23.9 | 24-2 | 24-6 | |
| 80 | 262 | | 20.7 | 21.5 | 22.2 | 22.8 | 23.3 | 23.7 | 24-1 | 24-5 | 24.8 | 25-2 | |
| 85 | 279 | | 21.3 | 22.1 | 22.8 | 23.4 | 23.9 | 24.3 | 24.7 | 25-1 | 25.4 | 25.8 | |
| 90 | 205 | | 21.8 | 22.6 | 23.3 | 23.9 | 24.4 | 24.8 | 25.2 | 25.6 | 25.9 | 26.3 | |
| 95 | 312 | | 22.4 | 23.2 | 23.9 | 24-5 | 25-0 | 25-4 | 25.8 | 26.2 | 26.5 | 26-9 | |
| | | | | | | | | | | | | | |
| metres | feet | metres | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Heig | ht of | feet | 3 | 7 | 10 | 13 | 16 | 20 | 23 | 26 | 30 | 33 | |
| lie | aht | | | | | | Height | of eye | | | | | |

Lights - distance off in Miles when rising or dipping