

# GARMIN GPS73 MARK-LAYING PROCEDURES

## W/L COURSE

**Note:** Initial positions are SB1, RF1, 101, 1A1, 4P1 etc. **Subsequent** positions are SBx, RFx, 10x, 1Ax, 4Px etc. Waypoint (WPT) names are saved as SB1, RF1 etc. **Not** WPT SB1, WPT RF1 etc.

### Laying The Start Pin (100/200m Line)

1. MARK the SB, re-name WPT SBx, SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.

Start Line Axis = Course Axis (\_\_\_\_) - 90degrees = (\_\_\_\_).

2. Motor from the SB along the Start Line Axis to a Distance of 100/200m from WPT SBx.

3. Turn 90degrees left and continue down-course to Distance 140/220m from WPT SBx (approximately 100m below the Start Line).

4. Turn back up-course and start streaming the SP parallel to the SB axis to compensate for crosstide.

5. Pass abeam the SB on a Bearing To WPT SBx of Start Line Axis (\_\_\_\_) + 180 degrees = (\_\_\_\_), Distance 100/200m, with all the anchor warp deployed.

6. The Race Officer will verify the distance using a laser rangefinder and call "drop" when the mark is approximately 3m downwind of the Start Line Axis.

7. Return to the SP, check for drift and take a transit bearing of the SP/SB Orange Flag to check alignment. Shortening the anchor warp on the SP or SB is the easiest way to correct the alignment if depth allows. Otherwise lengthen the SB anchor warp or drag the SP downwind. As a guide move the SP/SB 10m upwind/downwind for every 5 degrees of correction on a 100m Start Line. Double this correction for a 200m Start Line.

### Laying The Finish Pin (50m Line)

1. MARK the SB, re-name WPT SBx, SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.

2. Request the Finish Line Axis from the Race Officer (it may not be at 90 degrees to the original Course Axis if competitors have to pass through Gate 4P/4S on the last leg of the course).

3. Motor from the SB along the Finish Line Axis (\_\_\_\_) to Distance 50m from WPT SBx.

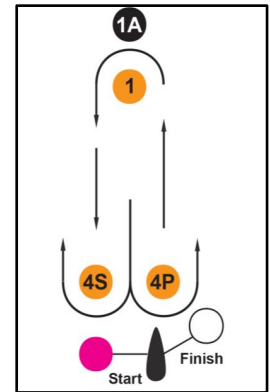
4. Turn right 90degrees and continue down-course to Distance 110m from SBx (approximately 100m below the Finish Line).

5. Turn back up-course and start streaming the FP parallel to the SB axis to compensate for crosstide.

6. Pass abeam the SB on a Bearing To WPT SBx of Finish Line Axis (\_\_\_\_) + 180degrees = (\_\_\_\_), Distance 50m, with all the anchor warp deployed.

7. The Race Officer will verify the distance using a laser rangefinder and call "drop" when the mark is approximately 3m downwind of the Finish Line Axis.

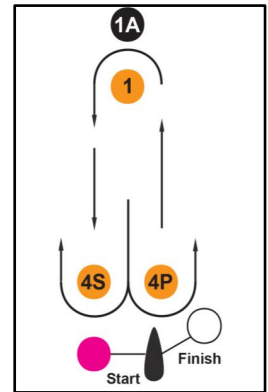
8. Return to the FP, check for drift and take a transit bearing of the FP/SB Orange Flag to check alignment. Shortening the anchor warp on the FP is the easiest way to correct the alignment if depth allows. Otherwise drag the FP downwind or re-lay. As a guide move the FP 10m upwind/downwind for every 10degrees of correction required on a 50m Finish Line.



9. If the Race Officer is busy starting subsequent races and can't make the "drop" call, stop on a Bearing to WPT SBx of Finish Line Axis (\_\_\_\_) + 180 degrees = (\_\_\_\_), Distance 50m. Cross-check with a hand-bearing compass and refine position if necessary before dropping the tidestick.

10. Continue streaming up-course parallel to the SB axis and drop the anchor when the FP is 3m downwind of the tidestick.

11. Recover the tidestick then return to the FP, check for drift and take a transit bearing of the FP/SB Orange Flag to check alignment. If correction required see above...



### Laying Mark 1

1. 'Project' a new waypoint from WPT SBx (or Rfx) along a Bearing of Course Axis (4 - 1)(\_\_\_\_), Distance(4 - 1)(\_\_\_\_) from WPT SBx (or Rfx). 'Save and Edit' as WPT 10x, then SELECT 'Go'.

2. Motor to WPT 10x, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to WPT SBx (or Rfx) is Course Axis(4 - 1)(\_\_\_\_) + 180degrees = (\_\_\_\_) and the distance is correct.

3. Drop Mark 1 at this position and motor up-course whilst paying out the anchor warp.

4. Drop the anchor then return to Mark 1, check for drift and re-lay if necessary.

### Laying Mark 1A (Extended)

1. 'Project' a new waypoint from WPT SBx (or Rfx) along a Bearing of Course Axis (4 - 1)(\_\_\_\_), Distance (4 - 1A)(\_\_\_\_). 'Save and Edit' as WPT 1Ax then SELECT 'Go'.

2. Motor to WPT 1Ax, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to WPT SBx (or Rfx) is Course Axis(4 - 1)(\_\_\_\_) + 180degrees = (\_\_\_\_) and the distance is correct.

3. Drop Mark 1A and continue up-course whilst paying out the anchor warp.

4. Drop the anchor then return to Mark 1A, check for drift and re-lay if necessary.

### Laying an Offset Mark

1. MARK the 'settled' position of Mark 1(or 1A), re-name WPT 10x (or 1Ax), SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.

Offset Mark Axis = Course Axis (4 - 1)(\_\_\_\_) - 80degrees = (\_\_\_\_)

2. Motor from Mark 1(or 1A) along the Offset Mark Axis to Distance 60m from WPT 10x (or 1Ax).

3. Turn left 90 degrees and motor down-course to Distance 110m from WPT 10x (or 1Ax).

4. Reverse course and start streaming the mark.

5. Stop on a Bearing To WPT 10x (or 1Ax) of Offset Mark Axis (\_\_\_\_) + 180degrees = (\_\_\_\_), Distance 50m. Cross-check with a hand-bearing compass and refine position if necessary before dropping the tidestick.

**Note: accurate alignment (+/- 10 degrees) is more important than Distance (+/- 10m).**

6. Continue streaming up-course and drop the anchor when the mark is 3m short of the tidestick.

7. Recover the tidestick then return to the mark, check for drift and take a transit bearing of the Offset Mark/Mark 1(1A) to check alignment. **If outside +/- 10degrees** shorten the anchor warp on either mark if depth to correct alignment if depth permits. Otherwise drag one mark downwind or re-lay. As a guide every 10degrees of correction will require 10m of mark movement on a 60m Offset Mark.

## Laying Gate 4P/4S

**Note: Assumes 100m/200m Start Line, 50m wide Gate, set 90m up the Course Axis.**

1. MARK the SB, re-name WPT SBx, SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.

Gate/Start Line Axis = Course Axis (4 - 1)(\_\_\_\_) - 90 degrees = (\_\_\_\_)

2. Motor from the SB along the Start Line Axis to Distance 25m/75m from WPT SBx. Bearing to WPT SBx will be Start Line Axis (\_\_\_\_) + 180degrees = (\_\_\_\_).

3. Stop and MARK position, note default WPT name (\_\_\_\_), press MENU then 'Project' a new waypoint along a Bearing of Course Axis (4 - 1)(\_\_\_\_), Distance 90m. 'Save and Edit' as WPT 4Px then SELECT 'Go'.

4. Move to WPT 4Px then sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to the default WPTxxx is Course Axis (4 - 1)(\_\_\_\_) + 180degrees = (\_\_\_\_), Distance 90m.

5. Drop Mark 4P and motor up-course making an allowance for crosstide whilst paying-out the anchor warp..

6. Drop the anchor then return to Mark 4P, check for drift and re-lay if necessary.

7. MARK the 'settled' position of Mark 4P, re-name WPT 4Px, SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.

8. Motor from Mark 4P along the Gate Axis to Distance 50m from WPT 4Px (this is the approximate position of Mark 4S). Turn 90 degrees left and motor down-course until abeam the SB.

9. Turn back up the Course Axis and start streaming the mark.

10. Stop on a Bearing To WPT 4Px of Gate Axis (\_\_\_\_) + 180 = (\_\_\_\_), Distance 50m . Cross-check with a hand-bearing compass and refine position if necessary before dropping the tidestick.

**Note: accurate Gate alignment (+/- 10 degrees) is more important than Gate width (+/-10m)**

11. Continue motoring up-course making an allowance for crosstide and drop the anchor when Mark 4S is 3m downwind of the tidestick.

12. Recover the tidestick then return to Mark 4S and take a transit bearing of Gate 4S/4P with a hand-bearing compass to check alignment. **If outside +/- 10degrees** shorten the anchor warp on either mark if depth permits to correct alignment. Otherwise drag one mark downwind or re-lay. As a guide every 10degrees of correction will require 10m of mark movement on a 50m wide Gate.

## Laying Gate 4P/4S (Using a REFERENCE point)

Gate Axis = Course Axis (\_\_\_\_) - 90degrees = (\_\_\_\_)

1. Drop Mark 4P on a Bearing To WPT Rfx of Gate Axis, Distance 25m.

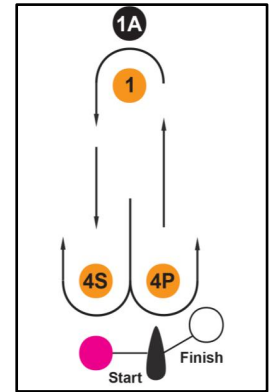
2. Motor up-course whilst paying-out the anchor warp.

3. Drop the anchor and return to Mark 4P, check for drift and re-lay if necessary.

4. MARK the 'settled' position of Mark 4P, re-name WPT 4Px, SELECT 'Done' then GOTO this waypoint on the Waypoint Manager page.

5. Motor from Mark 4P along the Gate Axis to Distance 50m from WPT 4Px (this is the approximate position of Mark 4S). Turn 90 degrees left and motor down-course until abeam the SB..

6. Turn back up the Course Axis and start streaming the mark.

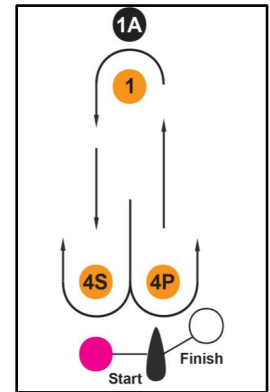


7. Stop on a Bearing To WPT 4Px of Gate Axis (\_\_\_\_) + 180 = (\_\_\_\_), Distance 50m. Cross-check with a hand-bearing compass and refine position if necessary before dropping the tidestick.

**Note: accurate Gate alignment (+/- 10 degrees) is more important than Gate width (+/-10m).**

8. Continue motoring up-course making an allowance for crosstide and drop the anchor when Mark 4S is 3m downwind of the tidestick.

9. Recover the tidestick then return to Mark 4S and take a transit bearing of Gate 4S/4P with a hand-bearing compass to check alignment. **If outside +/- 10degrees** shorten the anchor warp on either mark to correct alignment if depth permits. Otherwise drag one mark downwind or re-lay. As a guide every 10degrees of correction will require 10m of mark movement on a 50m wide Gate.



### Adjusting Gate 4P/4S Following A Course Change

1. **New** Course Axis (4 - 1)(\_\_\_\_) - 90degrees = **New** Gate Axis (\_\_\_\_).

2. Adjust the position of Mark 4P or 4S to correct to the **New** Gate Axis. As a guide every 10degrees of correction will require one mark to be moved 10m upwind if depth permits. Otherwise drag one mark downwind.

3. As a last resort, recover the anchor and 'stream-in' Mark 4S on the **New** Gate Axis, Distance 50m.

### Re-Laying Mark 1/1A (Extended) Following A Course Change

1. If the Course Axis(4 - 1) or Leg Length(4 - 1)changes, 'Project' a new waypoint from WPT SBx (or RFX) along a Bearing of **New** Course Axis(4 - 1)(\_\_\_\_), **New** Distance (\_\_\_\_). Save and Edit' as WPT 10x (or 1Ax) then SELECT 'Go'.

2. Move to WPT 10x (or 1Ax), sequence PAGE to display Menu, select Waypoint Manager and check the Bearing to WPT SBx (or RFX) is the **New** Course Axis (\_\_\_\_) + 180degrees = (\_\_\_\_) and the **New** Distance is correct.

3. Drop the Change Mark and motor up-course whilst paying out the anchor warp.

4. Drop the anchor then return to the Change Mark, check for drift and re-lay if necessary.

5. Recover the original Mark 1/1A .

# GARMIN GPS73 MARK-LAYING PROCEDURES

## TRAPEZOID COURSE

### Laying Mark 2

**Note: use WPT SBx or RFX as the Reference Point in the tables.**

1. Enter the **appropriate** Trapezoid Tables (60/70 degrees) and extract Mark 2 Bearing and Leg Length from the Reference Point:

Course Axis (3 - 2)(\_\_\_\_), Leg length (3 - 2)(\_\_\_\_)

Bearing (4 - 2)(\_\_\_\_), Leg length (4 - 2)(\_\_\_\_)

'Project' a new waypoint from WPT SBx (or RFX) along Bearing (4 - 2), Distance (4 - 2). 'Save and Edit' as WPT 20x then SELECT 'Go'.

2. Motor to WPT 20x, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to SBx (or RFX) is (2 - 4)(\_\_\_\_) from the Trapezoid Table and the distance is correct.

3.. Drop Mark 2, then motor upwind whilst paying out the anchor warp.

4.. Drop anchor, return to Mark2, check for drift and re-lay if necessary.

### Laying Mark 2A (Extended Mark)

1. 'Project' a new waypoint from WPT 20x along a Bearing of Course Axis (3 - 2) (\_\_\_\_), Distance (2A - 2)(\_\_\_\_). 'Save and Edit' as WPT 2Ax then SELECT 'Go'.

2. Motor to WPT 2Ax, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to WPT 20x is (2 - 3)(\_\_\_\_) from the Trapezoid Table and the distance is correct.

3. Drop Mark 2A, then motor up-course whilst paying-out the anchor warp.

4. Drop the anchor and return to Mark 2A, check for drift and re-lay if necessary.

### Laying Gate 3P/3S

**Note: use WPT SBx or RFX as the Reference Point in the tables .**

1. Enter the **appropriate** Trapezoid Tables (60/70 degrees) and extract Mark 3 Bearing and Leg Length from the Reference Point:

Course Axis (3 - 2)(\_\_\_\_), Leg length (3 - 2)(\_\_\_\_)

Bearing (4 - 3)(\_\_\_\_), Leg Length (4 - 3)(\_\_\_\_)

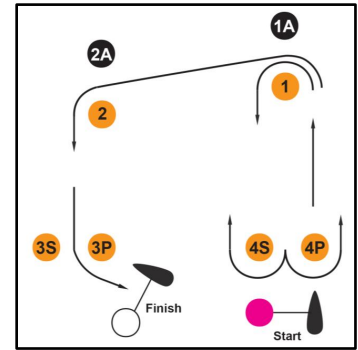
2. 'Project' a new waypoint from WPT SBx (or RFX) along Bearing (4 - 3), Distance (4 - 3), 'Save and Edit' as WPT 3Px then SELECT 'Go'.

3. Motor to WPT 3Px, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to WPT SBx (or RFX) is (3 - 4)(\_\_\_\_) from the Trapezoid Table and the distance is correct.

4. Drop Mark 3P and motor upwind whilst paying-out the anchor warp.

5. Drop anchor, return to Mark 3P, check for drift and re-lay if necessary.

6. MARK the 'settled' position of Mark 3P, re-name WPT 3Px, SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.



Gate Axis = Course Axis (3 - 2)(\_\_\_\_) - 90degrees = (\_\_\_\_)

7. Motor along the Gate Axis from Mark 3P to Distance 50m from WPT 3Px (this is the approximate position of Mark 3S).

8. Turn left 90degrees and motor down-course to Distance 110m from WPT 3Px.

9. Turn back up-course and start streaming Mark 3S.

10. Stop on a Bearing To WPT 3Px of Gate Axis (\_\_\_\_) + 180 degrees = (\_\_\_\_), Distance 50m. Cross-check with hand-bearing compass and refine position if necessary before dropping the tidestick.

**Note: accurate Gate alignment (+/- 10 degrees) is more important than Gate width (+/-10m).**

11. Continue streaming up-course and drop the anchor when Mark 3S is 3m short of the tidestick.

12. Recover the tidestick, return to Mark 3S, check for drift and take a transit bearing of Marks 3S/3P to check alignment. **If outside +/- 10degrees** shorten the anchor warp on either mark to correct the alignment if water depth permits. Otherwise drag one mark downwind or re-lay. As a guide every 10degrees of correction will require 10m of mark movement on a 50m Gate.

13. Pass position of WPT 3Px to Mark 2 MLB for course change reference.

### Laying The Finish Pin (50m)

1. 'Project' a new waypoint from WPT 3Px on a Bearing (3 - Finish)(\_\_\_\_) from the **appropriate** Trapezoid Table (60/70 degrees), Distance 0.15NM. 'Save and Edit' as WPT FPx then SELECT 'Go'.

2. Motor to WPT FPx, sequence PAGE button to display Menu, select Waypoint Manager and confirm the Bearing To WPT 3Px is (Finish - 3)(\_\_\_\_) from the Trapezoid Table and the Distance is correct.

3. Drop the FP and motor up-course whilst paying-out the anchor warp.

4. Drop the anchor, return to the FP, check for drift and re-lay if necessary.

5. MARK the 'settled' position of the FP, re-name WPT FPx, SELECT 'Done' then GOTO this waypoint on the Waypoint Manager page.

6. If acting as the Finishing Boat, anchor on a Bearing to WPT FPx of (Finish - 3)(\_\_\_\_) - 90degrees = (\_\_\_\_), Distance 50m.

### Re-Laying Mark 2/2A (Extended) Following A Course Change

**Note: The Trapezoid Tables are only used for the initial course layout. Subsequent course changes on the Outer Loop (2/2A - 3P/3S - 2/2A) are referenced to the Mark 3P position.**

1. Request position of WPT 3Px from the Gate 3P/3S MLB if not already passed.

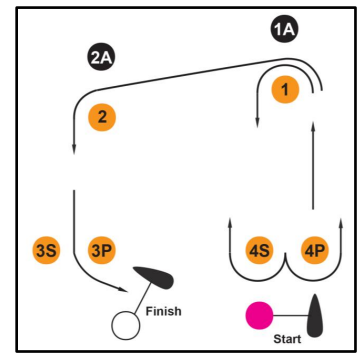
WPT 3Px Position = N22\_\_\_\_\_, E114\_\_\_\_\_.

Press MARK, re-name WPT 3Px, edit LAT/LONG then SELECT 'Done'. **Goto Step 2.**

**If** WPT 3Px position is **NOT** available you will have to derive it yourself using the following procedure:

Enter the **appropriate** Trapezoid Table (60/70 degrees) with the **Initial** Course Axis(3 - 2)(\_\_\_\_) and **Initial** Leg Length (3 - 2)(\_\_\_\_).

**Initial** Bearing (4 - 3)(\_\_\_\_), **Initial** Leg Length (4 - 3)(\_\_\_\_)



'Project' a new waypoint from WPT SBx (or RFx) along the **Initial** Bearing (4 - 3), Distance (4 - 3), 'Save and Edit' as WPT 3Px (do **NOT** SELECT 'Go' !).

2. Sequence PAGE to display Waypoint Manager, SELECT WPT 3Px then MENU, then 'Project' a new waypoint from WPT 3Px along a Bearing of **New**(3 - 2)(\_\_\_\_), **New** Distance (3 - 2)(\_\_\_\_). 'Save and Edit' as WPT 20x then SELECT 'Go'.

3. Motor to WPT 20x, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to WPT 3Px is **New**(2 - 3)(\_\_\_\_) from the Trapezoid Table and the distance is correct.

4. Drop the Change Mark, then motor upwind whilst paying out the anchor warp.

5. Drop anchor, return to the Change Mark, check for drift and re-lay if necessary.

6. Recover the original Mark 2.

7. **If** Mark 2A (Extended) is laid, 'Project' a new waypoint from WPT 3Px along a Bearing of **New**(3 - 2)(\_\_\_\_), **New** Distance(3 - 2A)(\_\_\_\_). 'Save and Edit' as WPT 2Ax then SELECT 'Go'.

8. Motor to WPT 2Ax, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to WPT 3Px is **New**(2 - 3)(\_\_\_\_) from the Trapezoid Tables and the distance is correct.

9. Drop the Change Mark, then motor upwind whilst paying out the anchor warp.

10. Drop anchor, return to the Change Mark, check for drift and re-lay if necessary.

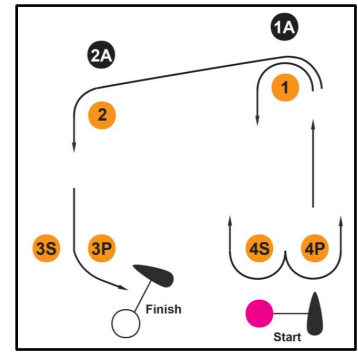
11. Recover the original Mark 2A .

### Adjusting Gate 3P/3S Following A Course Change

1. **New** Course Axis (3 - 2)(\_\_\_\_) - 90degrees = **New** Gate Axis (\_\_\_\_).

2. Adjust the position of Mark 3P or 3S to correct to the **New** Gate Axis. As a guide every 10degrees of correction will require one mark to be moved 10m upwind if depth permits. Otherwise drag one mark downwind or re-lay. **Note: accurate Gate alignment (+/- 10 degrees) is more important than Gate width (+/-10m).**

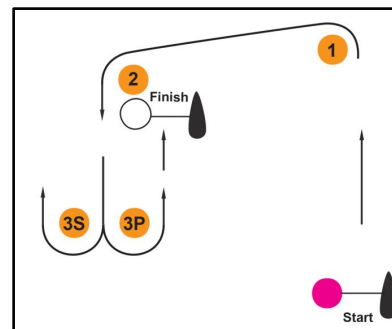
3. As a last resort, recover the anchor and 'stream-in' Mark 3S again on the **New** Gate Axis, Distance 50m.



## GARMIN GPS73 MARK-LAYING PROCEDURES

### OPTIMIST TRAPEZOID COURSE

**Note: The Optimist Trapezoid course has EQUAL leg lengths: Start - 1 = 1 - 2 = 2 - 3P/3S and a windward Finish Line adjacent to Mark 2 on the inside of the course. The REFERENCE point is the middle of the Start Line. Use the dedicated Optimist Trapezoid Course tables to lay all the marks .**



#### Laying The Start Pin (100/200m Line)

1. MARK the SB, re-name WPT SBx, SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.

Start Line Axis = Course Axis (\_\_\_\_) - 90degrees = (\_\_\_\_).

2. Motor from the SB along the Start Line Axis to a Distance of 100/200m from WPT SBx.

3. Turn 90degrees left and continue down-course to Distance 140/220m from WPT SBx (approximately 100m below the Start Line).

4. Turn back up-course and start streaming the SP parallel to the SB axis to compensate for crosstide.

5. Pass abeam the SB on a Bearing To WPT SBx of Start Line Axis (\_\_\_\_) + 180 degrees = (\_\_\_\_), Distance 100/200m, with all the anchor warp deployed.

6. The Race Officer will verify the distance using a laser rangefinder and call "drop" when the mark is approximately 3m downwind of the Start Line Axis.

7. Return to the SP, check for drift and take a transit bearing of the SP/SB Orange Flag to check alignment. Shortening the anchor warp on the SP or SB is the easiest way to correct the alignment if the depth allows. Otherwise lengthen the SB anchor warp or drag the SP downwind. As a guide move the SP/SB 10m upwind/downwind for every 5 degrees of correction on a 100m Start Line. Double this correction for a 200m Start Line.

#### Laying Mark 1

Start Line Axis = Course Axis(\_\_\_\_) - 90degrees = (\_\_\_\_)

1. MARK the SB, re-name WPT SBx, SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.

2. Motor from the SB along the Start Line Axis and MARK position in the middle. Re-name WPT Rfx then SELECT 'Done'.

3. Sequence PAGE to display Menu, SELECT Waypoint Manager then WPT Rfx then MENU. 'Project' a new waypoint along a Bearing of Course Axis(\_\_\_\_), Distance(Ref - 1)(\_\_\_\_). 'Save and Edit' as WPT 10x then SELECT 'Go'.

4. Motor to WPT 10x, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to WPT Rfx is (1 - Ref)(\_\_\_\_) from the Optimist Trapezoid Table and the distance is correct.

5. Drop Mark 1 at this position and motor up-course whilst paying out the anchor warp.

6. Drop the anchor then return to Mark 1, check for drift and re-lay if necessary.

#### Laying Mark 2

Start Line Axis = Course Axis(\_\_\_\_) - 90degrees = (\_\_\_\_)



1. MARK the SB, re-name WPT SBx, SELECT 'Done' then GOTO this WPT on the WPT Manager Page.

2. Motor from the SB along the Start Line Axis and MARK position in the middle. Re-name WPT Rfx then SELECT 'Done'.

3. Enter the Optimist Trapezoid Table with Course Axis(\_\_\_\_) and Leg Length(Ref - 1)(\_\_\_\_).

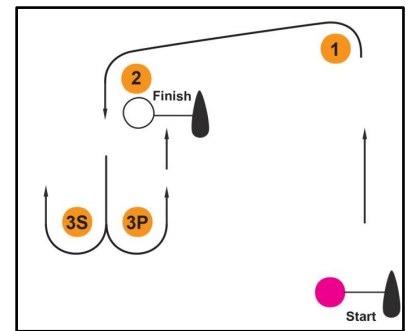
Bearing (2 - Ref)(\_\_\_\_) + 180degrees = Bearing (Ref - 2)(\_\_\_\_)

4. 'Project' a new waypoint from WPT Rfx along Bearing (Ref - 2), Distance (Ref - 2). 'Save and Edit' as WPT 20x then SELECT 'Go'.

5. Motor to WPT 20x, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to WPT Rfx is (2 - Ref) and the distance is correct.

6. Drop Mark 2, then motor upwind whilst paying out the anchor warp.

7. Drop anchor, return to Mark2, check for drift and re-lay if necessary.



### Laying Gate 3P/3S

Start Line Axis = Course Axis(\_\_\_\_) - 90degrees = (\_\_\_\_)

1. MARK the SB, re-name WPT SBx, SELECT 'Done' then GOTO this WPT on the WPT Manager Page.

2. Motor from the SB along the Start Line Axis and MARK position in the middle. Re-name WPT Rfx then SELECT 'Done'.

3. Enter the Optimist Trapezoid Table with Course Axis(\_\_\_\_) and Leg Length(Ref - 1)(\_\_\_\_).

Bearing (3 - Ref)(\_\_\_\_) + 180 degrees = Bearing (Ref - 3)(\_\_\_\_)

4. 'Project' a new waypoint from WPT Rfx along Bearing (Ref - 3), Distance (Ref - 3), 'Save and Edit' as WPT 3Px then SELECT 'Go'.

5. Motor to WPT 3Px, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to WPT Rfx is (3 - Ref) and the distance is correct.

6. Drop Mark 3P and motor upwind whilst paying-out the anchor warp.

7. Drop anchor, return to Mark 3P, check for drift and re-lay if necessary.

8. MARK the 'settled' position of Mark 3P, re-name WPT 3Px, SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.

Gate Axis(\_\_\_\_) = Course Axis (\_\_\_\_) - 90degrees = (\_\_\_\_)

9. Motor along the Gate Axis from Mark 3P to Distance 50m from WPT 3Px (this is the approximate position of Mark 3S).

10. Turn left 90degrees and motor down-course to Distance 110m from WPT 3Px.

11. Turn back up-course and start streaming Mark 3S.

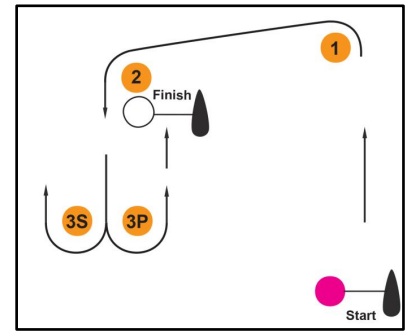
12. Stop on a Bearing To WPT 3Px of Gate Axis (\_\_\_\_) + 180 degrees = (\_\_\_\_), Distance 50m. Cross-check with hand-bearing compass and refine position if necessary before dropping the tidestick.

**Note: accurate Gate alignment (+/- 10 degrees) is more important than Gate width (+/-10m).**

13. Continue streaming up-course and drop the anchor when Mark 3S is 3m short of the tidestick.

14. Recover the tidestick, return to Mark 3S, check for drift and take a transit bearing of Marks 3S/3P to check alignment. **If outside +/- 10degrees** shorten the anchor warp on either mark to correct the alignment if depth permits. Otherwise drag one mark downwind or re-lay. As a guide every 10degrees of correction will require 10m of mark movement on a 50m Gate.

15. Pass position of WPT 3Px to Mark 2 MLB for course change reference.



### Laying The Finish Pin (50m)

1. MARK the position of Mark 2, re-name WPT 20x, SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.
2. Drop the Finish Pin on a Bearing To WPT 20x of Course Axis(\_\_\_\_) - 60degrees = (\_\_\_\_), Distance 80m.
3. Return to MARK the 'settled' position of the Finish Pin, re-name WPT FPx SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.
4. If acting as the Finishing Boat, anchor on a Bearing To WPT FPx of Course Axis (\_\_\_\_) - 90degrees = (\_\_\_\_), Distance 50m.

### Re-Laying Mark 1 Following A Course Change

1. If the Course Axis or Leg Length changes, 'Project' a new waypoint from WPT Rfx along a Bearing of **New** Course Axis(\_\_\_\_), **New** Distance (Ref - 1)(\_\_\_\_). Save and Edit' as WPT 10x then SELECT 'Go'.
2. Motor to WPT 10x, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to WPT Rfx is the **New** Course Axis (\_\_\_\_) + 180degrees = (\_\_\_\_) and the **New** Distance is correct.
3. Drop the Change Mark and motor up-course whilst paying out the anchor warp.
4. Drop the anchor then return to the Change Mark, check for drift and re-lay if necessary.
5. Recover the original Mark 1.

### Re-Laying Mark 2 Following A Course Change

**Note: The Optimist Trapezoid Tables are only used for the initial course layout. Subsequent course changes on the Outer Loop( 2 - 3P/S - 2) are referenced to the Mark 3P position.**

**New** Course Axis(3 - 2)(\_\_\_\_), **New** Distance (3 - 2)(\_\_\_\_) will be passed by the Race Officer .

1. Request position of WPT 3Px from the Gate 3P/3S MLB if not already passed.

WPT 3Px Position = N22\_\_\_\_\_, E114\_\_\_\_\_.

Press MARK, re-name WPT 3Px, edit LAT/LONG then SELECT 'Done'. **Goto Step 2.**

**If** WPT 3Px position is **NOT** available you will have to derive it yourself using the following procedure:

Enter the Optimist Trapezoid Table with the **Initial** Course Axis(\_\_\_\_) and **Initial** Leg Length (Ref - 1)(\_\_\_\_).

**Initial** Bearing (2 - Ref)(\_\_\_\_) + 180 degrees = **Initial** Bearing (Ref - 2)(\_\_\_\_)

**Initial** Leg Length(Ref - 2)(\_\_\_\_)

'Project' a new waypoint from WPT Rfx along the **Initial** Bearing (Ref - 2), Distance (Ref - 2), 'Save and Edit' as WPT 3Px (do **NOT** SELECT 'Go'!).

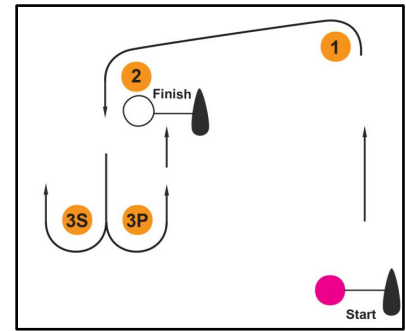
2. Sequence PAGE to display Waypoint Manager, SELECT WPT 3Px then MENU, then 'Project' a new waypoint from WPT 3Px along a Bearing of **New** Course Axis(3 - 2), **New** Distance(3 - 2), 'Save and Edit' as WPT 20x then SELECT 'Go'.

3. Motor to WPT 20x, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to WPT 3Px is **New** Course Axis(3 - 2)(\_\_\_\_) + 180 degrees = (\_\_\_\_) and the **New** distance is correct.

4. Drop the Change Mark, then motor upwind whilst paying out the anchor warp.

5. Drop anchor, return to the Change Mark, check for drift and re-lay if necessary.

6. Recover the original Mark 2.



### **Adjusting Gate 3P/3S Following A Course Change**

1. **New** Course Axis (\_\_\_\_) - 90degrees = **New** Gate Axis (\_\_\_\_).

2. Adjust the position of Mark 3P or 3S to correct to the **New** Gate Axis. As a guide every 10degrees of correction will require one mark to be moved 10m upwind if depth permits. Otherwise drag one mark downwind or re-lay. **Note: accurate Gate alignment (+/- 10 degrees) is more important than Gate width (+/-10m).**

3. As a last resort, recover the anchor and 'stream-in' Mark 3S again on the **New** Gate Axis, Distance 50m.

## GARMIN GPS73 MARK-LAYING PROCEDURES

### OPTIMIST GREEN FLEET TRIANGULAR COURSE

**Note: assumes 45/90/45 degree inner angles. The REFERENCE Point is the middle of the Start/Finish Line which is in the middle of Leg 3 - 1.**

#### Laying The Start Pin (100/200m Line)

1. MARK the SB, re-name WPT SBx, SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.

Start Line Axis = Course Axis (\_\_\_\_) - 90degrees = (\_\_\_\_).

2. Motor from the SB along the Start Line Axis to a Distance of 100/200m from WPT SBx.

3. Turn 90degrees left and continue down-course to Distance 140/220m from WPT SBx (approximately 100m below the Start Line).

4. Turn back up-course and start streaming the SP parallel to the SB axis to compensate for crosstide.

5. Pass abeam the SB on a Bearing To WPT SBx of Start Line Axis (\_\_\_\_) + 180 degrees = (\_\_\_\_), Distance 100/200m, with all the anchor warp deployed.

6. The Race Officer will verify the distance using a laser rangefinder and call "drop" when the mark is approximately 3m downwind of the Start Line Axis.

7. Return to the SP, check for drift and take a transit bearing of the SP/SB Orange Flag to check alignment. Shortening the anchor warp on the SP or SB is the easiest way to correct the alignment if depth allows. Otherwise lengthen the SB anchor warp or drag the SP downwind. As a guide move the SP/SB 10m upwind/downwind for every 5 degrees of correction on a 100m Start Line. Double this correction for a 200m Start Line.

#### Laying Mark 1

1. Motor from the SB along the Start Line Axis and MARK position in the middle. Re-name WPT RFx then SELECT 'Done'.

2. 'Project' a new waypoint along a Bearing of Course Axis (\_\_\_\_), Distance (Ref - 1) (\_\_\_\_) from WPT RFx. 'Save and Edit' as WPT 10x then SELECT 'Go'.

3. Motor to WPT 10x then sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to WPT RFx is Course Axis (\_\_\_\_) + 180degrees = (\_\_\_\_), Distance (Ref - 1).

4. Drop Mark 1 then motor up-course whilst paying-out the anchor warp.

5. Drop the anchor then return to Mark 1, check for drift and re-lay if necessary.

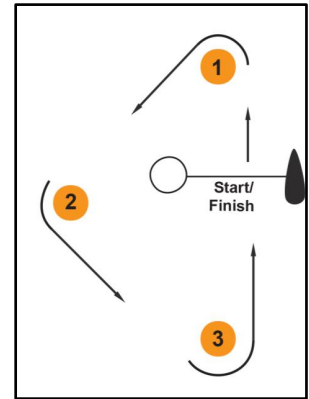
#### Laying Mark 2

1. 'Project' a new waypoint from WPT RFx along a Bearing of Course Axis(\_\_\_\_) - 90degrees = (\_\_\_\_), Distance (Ref - 1) (\_\_\_\_). 'Save and Edit' as WPT 20x then SELECT 'Go'.

2. Move to WPT 20x then sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing To WPT RFx is Course Axis(\_\_\_\_) + 90 degrees = (\_\_\_\_), Distance (Ref - 1).

3. Drop Mark 2 then motor up-course whilst paying-out the anchor warp.

4. Drop the anchor then return to Mark 2, check for drift and re-lay if necessary



### **Laying Mark 3**

1. 'Project' a new waypoint from WPT RFX along a Bearing of Course Axis (\_\_\_\_) + 180degrees = (\_\_\_\_), Distance (Ref - 1). 'Save and Edit' as WPT 30x, then SELECT 'Go'.
2. Move to WPT 30x, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to RFX is the Course Axis, Distance (Ref - 1).
3. Drop Mark 3 then motor up-course whilst paying-out the anchor warp.
4. Drop the anchor then return to Mark 3, check for drift and re-lay if necessary.

## OPTIMIST GREEN FLEET W/L COURSE

**Note: The REFERENCE Point is the middle of the Start/Finish Line which is in the middle of Leg 3P/3S - 1.**

### Laying The Start Pin (100/200m Line)

1. MARK the SB, re-name WPT SBx, SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.

Start Line Axis = Course Axis (\_\_\_\_) - 90degrees = (\_\_\_\_).

2. Motor from the SB along the Start Line Axis to a Distance of 100/200m from WPT SBx.

3. Turn 90degrees left and continue down-course to Distance 140/220m from WPT SBx (approximately 100m below the Start Line).

4. Turn back up-course and start streaming the SP parallel to the SB axis to compensate for crosstide.

5. Pass abeam the SB on a Bearing To WPT SBx of Start Line Axis (\_\_\_\_) + 180 degrees = (\_\_\_\_), Distance 100/200m, with all the anchor warp deployed.

6. The Race Officer will verify the distance using a laser rangefinder and call "drop" when the mark is approximately 3m downwind of the Start Line Axis.

7. Return to the SP, check for drift and take a transit bearing of the SP/SB Orange Flag to check alignment. Shortening the anchor warp on the SP or SB is the easiest way to correct the alignment if depth allows. Otherwise lengthen the SB anchor warp or drag the SP downwind. As a guide move the SP/SB 10m upwind/downwind for every 5 degrees of correction on a 100m Start Line. Double this correction for a 200m Start Line.

### Laying Mark 1

1. Motor from the SB along the Start Line Axis and MARK position in the middle. Re-name WPT RFx then SELECT 'Done'.

2. 'Project' a new waypoint from WPT RFx along a Bearing of Course Axis, Distance (Ref - 1) (\_\_\_\_). 'Save and Edit' as WPT 10x, then SELECT 'Go'.

3. Move to WPT 10x, sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing to RFx is Course Axis (\_\_\_\_) + 180degrees = (\_\_\_\_), Distance (Ref - 1).

4. Drop Mark 1 and return to check for drift and re-lay if necessary.

### Laying Gate 3P/3S

1. 'Project' a new waypoint from WPT RFx along a Bearing of Course Axis (\_\_\_\_) - 180 degrees = (\_\_\_\_), Distance (Ref - 1). 'Save and Edit' as 3Px then SELECT 'Go'.

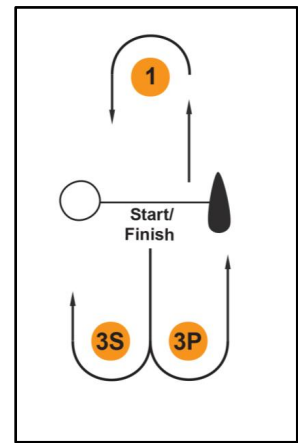
2. Move to WPT 3Px then sequence PAGE to display Menu, select Waypoint Manager and confirm the Bearing To WPT RFx is Course Axis, Distance (Ref - 1).

Gate Axis = Course Axis (\_\_\_\_) - 90degrees = (\_\_\_\_).

3. Motor along the Gate Axis and drop Mark 3P at a Distance of 25m from WPT 3Px.

4. Motor up-course whilst paying-out the anchor warp then drop the anchor.

5. Return to Mark 3P, check for drift and re-lay if necessary.



6. MARK the 'settled' position of Mark 3P, re-name 3Px, SELECT 'Done' then GOTO this WPT on the Waypoint Manager page.
7. Motor from Mark 3P along the Gate Axis to a Distance of 50m from WPT 3Px (this is the approximate position of Mark 3S).
8. Turn left 90degrees and motor down-course to Distance 110m from WPT 3Px.
9. Turn back up-course and start streaming Mark 3S.
10. Stop on a Bearing To WPT 3Px of Gate Axis (\_\_\_\_) + 180 degrees = (\_\_\_\_), Distance 50m. Cross-check with hand-bearing compass and refine position if necessary before dropping the tidestick. **Note: accurate Gate alignment (+/- 10 degrees) is more important than Gate width (+/-10m).**
11. Continue streaming up-course and drop the anchor when Mark 3S is 3m short of the tidestick.
12. Recover the tidestick, return to Mark 3S, check for drift and take a transit bearing of Marks 3S/3P to check alignment. **If outside +/- 10degrees** shorten the anchor warp on either mark to correct the alignment if depth permits. Otherwise drag one mark downwind or re-lay. As a guide every 10degrees of correction will require 10m of mark movement on a 50m Gate.