Planning & Running Dive Trips

There's a lot to think about when organising and marshalling a diving expedition.

This guide is intended to capture the know-how of experienced divers and help you plan and run your own trip safely and enjoyably.

Contents

Aims of a Dive Trip

Always remember what the planning and marshalling is trying to achieve. It's simple. There are only really two main considerations.

1) Is it safe?

2) Will it be enjoyable?

Every decision you make must first and foremost achieve the goal of safety, then – and only then – consider whether it will also be fun. If the answer to either or both questions is "no", don't do it. Think of something else to do, do it a different way or call the thing off. Never be shy about pulling a dive if you have good reason to believe it may not be safe or are sure it isn't likely to be enjoyable.

Don't let the amount to think about put you off volunteering to run a dive trip. There are some important core principles, but then the rest of it is to do with using common sense and thinking on your feet. The best thing to do is to get stuck in and run a trip. Make sure you have experienced divers on hand to help and give advice for your first few trips, but the most important thing is just to go for it. It's the best way to learn.

So, How Do I…?

…Plan a General Dive trip

… Understand tides and currents

In the English Channel, we get roughly two main tides per day as water swooshes up and down the channel under influence of Sun and Moon's gravity. Local ports like Portland and Southampton may get three or four tides due to 'resonance' effect of local geography. Never exactly two tides – a bit less each main high tide on average around 12 hours plus 40 to 50 mins later than last depending on location. Means that though many days have four tide table entries (2 highs and 2 lows), some have only three when final one goes past midnight. High & low tide levels vary. Biggest tidal range – i.e. highest highs and lowest lows – occur on "spring" tides (nothing to do with seasons). Smallest range – lowest highs and highest lows – on "neap" tides. Springs occur when Sun, Moon and Earth are in a straight line. Can easily tell as this gives new moon and full moon. Neaps are when Sun and Moon form a right angle with the Earth, gives waxing or waning half moons. So roughly speaking, half moons are neaps, full or new moons springs. In practice, tides lag moon phases by around 36 hours. Can forecast this for any time in future: look at the moon phase calendar at: http://www.iel.ncsu.edu/~dbostic/moon/moon0199.htm. Also, can get a moon phase calculator for personal organisers like 3Com PalmPilots (by Alex Garzia, from Pilot Gear HQ at http://www.pilotgear.com/) and Psions. Or can look in many paper diaries! Springs and neaps also vary in how extreme they are. Some springs have bigger range than others.

Called "high springs" – currents will be strongest and for a while after viz poorest. Neaps are best for wreck dives etc. Viz normally best when coming off neaps. Generally better on "flood tides" too (water rising/coming into shore) as brings settled water in from deeper areas. "Ebb tides" (water falling/going back out to sea) can sweep silt from shallows.

… Understand slack water

Slack water is simply the time at a given location when currents are very low or zero. Happens as current stops flowing one way and starts flowing the other. Seems logical that this is at high or low tide, but not the case. Direction, timing and strength of currents not only affected by tides. Also greatly affected by shape of coastline, depths, resonance factors and so on. Means that slack water can happen at very different times in places that are close together. Also means slacks are rarely **at** high or low water. They are always **relative** to high or low water though. Slack times thus expressed as a number of hours before/after high/low water at given port (doesn't have to be a local port), e.g. "3 hours after High Water Portland", or "5 and a half hours before Low Water Dover". Usually means time when water is at lowest current. May well be less than a knot or so (therefore safe to dive) for some time either side of this. This whole period called "slack window". Its length changes with spring or neaps. Springs cause more rapid current changes so window is shorter (e.g. 20 mins on high spring for some sites). Neaps gentle, therefore window bigger (maybe an hour for same site on good neap). Important to be able to estimate this as affect duration of dive or whether have time for two waves or not.

… Find out tide times

Important to know high and low tide times. Only way to predict slack water for wreck dives. Even on drift dives may need it to check currents not silly and know when slips have enough water to launch/retrieve RIB. Tide tables published by many sources. Coastal towns and dive shops sell little booklets/leaflets of local tides. Admiralty Chart suppliers (e.g. Kelvin Hughes) sell admiralty tide tables. If need tide times a lot, and especially well ahead, best is to get hold of computer programme to calculate them. I use one on a Windows PC that shows tide graphs or generates tables for any time hence at any European (in my version) port, adjusted for DST if need be. Possible to tide calculators for modern personal organisers now. Also, for the common ports we use, look in the on this web site for useful weekend listings. If you only have tide times for one port, others can be derived approximately. Many tables include listings of Dover Tidal Differences. Show how much time to add/take way from Dover high waters for any other port. Only then need this listing and Dover tide table to get rough HW anywhere. CPA has a version of this in a database on SmartGroups. If only have table for, say, Portland, but want to know Devonport, can convert to Portland to Dover , then Dover to Devonport. For rough planning, Dover Tidal Differences and a single tide table all you need. Get more accurate results with proper tables for the port though.

… Find out slacks and currents

Many diving books quote slack water times for dive sites with nasty currents. This is easiest to use. If not, best way is to use marine charts for that dive site. Charts have scattered points with letters in a diamond to label "tidal streams". Streams tend to flow roughly parallel to coastline though some (e.g. round Portland) very much more complex. For these need a tidal stream atlas showing more precise streams. For normal sites, find the letter for the stream most likely to apply to your dive site (one nearby or a similar distance from coastline). Chart will have a tidal stream table on it showing how the current strength and direction varies hour by hour relative to HW for both springs and neaps. Note: this HW can be any port – must look which it is. Don't assume local port. By finding section of this stream with currents less than a knot or so (direction rarely important here), can see where slack window is relative to HW at the port quoted. Can thus estimate when and how wide the slack window is for any given site at any date in future. Fairly good estimates but they are approximate, so need to be on site early in case slack is early.

… Match dive to divers' capabilities

Any dive must suit capabilities of all divers on trip. Best approach is to get firm bookings very early so all divers known. Can then look in club records, ask to see qualification logs or personal logbooks to assess experience and safe diving limits for all. From this information, can then plan best dives for that group. Often impossible to get firm names far in advance though, so next best thing is to plan dive for likely takers then publicise acceptable minimum diving quals/experience/recency for planned dive. Only accept those people meeting this. Last ditch approach is to accept divers below this standard **but** do two sites: first as plan, then another to suit the few others. Many things to consider. Safety primary of course. What maximum depths permissible for qualification level? (e.g. SAA limits are: Trainee 10m; Elementary Diver: 20m; Open Water Diver: 35m; Club Diver & above: 50m). Even if qualified, what about experience? May be qualified to 35m but what's the deepest they've done so far (may only be 20m, so 35m is too risky). Check recency too – don't plan to let someone anywhere near their max limits without them building up depth first (but hard to ensure), e.g. if done many dives to 50m but not dived beyond 25m for six months, then straight into 40m plus is dangerous: need a few 30 and 35m dives to get 'dived up' to it. Another major issue is deco diving: our club doesn't, but think about guests who may. This affect slack windows. If anyone doing deco, need to have a longer slack and or plan to have all doing deco on DSMBs at same time so boat can track divers. Are there Nitrox divers, and if so what depth limits can they handle? Consider equipment – if some in semi-drys beware of deeper longer dives early in the season. Diver attitude is important too: depth/recency etc may all be OK, but perhaps some of the party easily spooked by gloomy wrecks – if so, avoid known turbid wreck sites. Think of fitness too, if anyone in party not as fit as should be, avoid planning dives with awkward currents or enforced long swims etc. And last but not least, what style of diving suits the party best – are they all wreck fanatics, or scenic divers? Drifts or bimbles? Deep and exciting or shallow and relaxed? Marine life or dramatic landscapes? Hunters or conservationists? … Normally impossible to please everyone, but some parties have very strong bias so try to pick dives that suit.

… Choose the best dive sites

Many factors affect choice of site. Site itself is major one: dive books and other diver recommendations invaluable here. Hardboat skippers a great help. Look on the web too. Long range planning can also account for tides and 'typical weather' but little else. Day-before planning can take into account: likely weather & changes; experience etc. of divers going (see "… Match dive to divers' capabilities"); springs/neaps and whether a drift or wreck; recent visibility; how many waves of divers; sea state; temperatures, current RIB reliability; road trips and transport problems; and slips/launching issues. Several things to watch. If weather lumpy or will go lumpy during day, avoid sites with long sea trips. If wind offshore, can stay closer inshore to avoid worst. Be aware that 'wind against tide' makes bigger waves than wind running with tide, so lumps may change as tide changes even if weather same. In general avoid winds higher than force 4 in open sea. Work out launch retrieve times and compare to local tides & slip info to check slip has enough water when needed. If several waves of divers, don't choose sites a long way from slip and/or pick-up point. Will divers have 2 cylinders? If not, need single dive, or two shallower ones, or get back to air station easily at lunchtime. If weather not good, pick site where can do lunch/S.I. in sheltered bay.

… Organise accommodation

Best source is old favourites. Can't beat digs everyone knows and likes – ask club members and other divers for recommendations. If a hardboat trip, skippers always know good places to stay. If no joy here, refer to one of the many B&B guide books. Another good source is tourist info centres: they'll pick ones that meet your needs and can even make bookings for you. Ring directory enquiries to find T.I. centres. Some accommodation available on the web now too. Do a search or two and see what you get. Things to check before booking include: plenty of car parking space; somewhere to dry suit if poss; proximity/time to get to boat; ease of walking to pub/restaurant in evenings; security of kit left in cars; and make sure can get breakfast early enough to get to boat on time. Many digs do packed lunches if you ask too. If booking on behalf of others, make sure they pay you full amounts in advance to avoid problems later.

… Check the divers' qualifications and medicals

Make sure divers quals match dive – club member quals on file with secretary/D.O. Also ensure medicals in date else no dive. Take emergency contact details with you. Again, all on record with club sec. For guest divers, marshal should ask to see quals/medicals, for self protection in case of incident, but some orgs (e.g. PADI) don't demand medicals, so valid quals and current org membership ok here. If in doubt about capabilities, ask to see normal logbook.

… Marshal a General Dive

… Estimate journey and dive timings

Road journeys need to be based on experience, though computerised journey planners help a lot. Often not bad getting down there as typically early Sunday morning start. Allow more time in high summer though for weekender (esp. bank hol) traffic. If meeting for breakfast somewhere, make sure there's a clear departure time else time slips away very easily. Allow an hour once at site for preparing RIB, kitting up and launching. Sea trips are very variable. Depends on sea-miles, boat, tides and weather conditions. In practice, rare for our club to need more than half an hour to get to a site. If shotting a wreck, need to allow tons of extra time, even once on site: finding wreck may be hard, shotting it can take several attempts, and slack may be early. An hour is typically plenty even on the RIB (and if goes well can do it in ten mins flat). Normally need less with a good hardboat skipper.

… Ensure right safety equipment aboard

Ensure certain equipment available. If using hardboat and it doesn't have Oxygen (always should but check), take club O2 kit. Check full well in advance. Ditto first aid. Loos on board (esp. for female divers)? Club stuff normally kept with RIB anyway. Should be checked regularly. For RIB dives, take spare cylinder of air in case stage cylinder needed (or if bottle not full). Other kit standard: VHF radio, flares, fire extinguisher, anchor, spares… Diver recall signals a good idea too (underwater firecracker to tell divers to surface such as incident with other divers).

… Arrange meeting points and times

Make sure everyone knows where/when to meet. Make clear that if not there on time, others may have left. Can't afford to wait for people as delays cascade and ruin day for everyone else. Suggest car-shares or give names/numbers of others going on same trip. Ideally, swap mobile phone numbers in case of problems. If sites not known, try to provide map/directions. Make clear what the time refers to, no good people turning up at time stated if that's the time boat needs to leave. Specify meet up time a good half hour before departure depending on how easy parking/loading is.

… Make sure all dive details known

For hardboat dives, ideal way is issue info sheet to all divers with everything they need to know on it. Things to make clear: meeting places/times; hints at travel times; types of dives; max depths; what equipment needed (2 cyls, SMB/DSMB, flags…); whether to take food/drinks; special considerations like poor shelter so take hat & coat etc. Check how/where to get tanks filled after dives too – especially weekend trips where needed full first thing Sunday.

… Find out what the weather may do

More than a week out, hardly worth trying. Four or five days ahead, several sources. BBC early evening news around 6pm often gives long range idea of what weekend might do as early as Tuesday. Also, the Met Office website has good weather outlooks 4 days ahead, as do Online Weather and teletext websites. Teletext page 158 on ITV also gives weather 24hour outlook and tide times that day. There are the phone and fax services. Marinecall is one. Dial 09068 500 992 for a 2-5 day planning forecast for English Channel. The last 2 digits give range of different services - for details see www.marinecall.co.uk. Marinecall gives very useful details including forecast surf height and sea temperatures. **Beware though, this is a premium rate service** and will cost you a couple of pounds or more on your phone bill to get anything useful. Faxback weather services also premium rate. Marinecall does faxback forecasts too. Can even get weather by SMS text service from mobile phones now. Go to www.metoffice.com for full details. On the day, listen to the shipping forecast on Radio 4. Gives details for all sea areas and most importantly note changes in wind direction and strength. If going to swing from off-shore to on-shore, and/or force increasing, beware that conditions will worsen and allow for it.

… Decide if the weather is a problem

Most important safety factors are sea swell and surface viz. High seas make people ill and often less disciplined. Greater risk of injury when thrown around on boat. Most importantly can be exceptionally hard to see surfacing divers. Launch and retrieve likely to be hazardous too. Beware diving in more than Force 4 with a typical RIB. However, swell also influenced strongly by wind direction and combination of wind and tide directions. If wind coming off the land, swell normally far less than if coming in off the sea. If diving in the lee of land too, lessens swell. If wind going in opposite direction to tidal flow, waves kick up higher and if wind flowing with tide, waves ease off. Can also get bigger waves if deep depressions in Atlantic sending swells in. Main thing to note is whether conditions likely to get better or worse? Will wind lesser or strengthen, will direction swing for better or worse? Will tide go more with wind, or more against it? Try to guess impact of all this then can use to judge whether safe to stay out longer or head for shelter early. Waves not the only problem. Fog highly dangerous as divers easy to lose and navigation harder. Cold weather very bad for poorly protected divers, and/or after cold water dives and/or long high speed runs back to shore as all increases risk of hypothermia. Sudden precipitation normally only a problem if causes problems with visibility or cold.

… Decide whether to use SMBs

Decide for yourself first but then if on hardboat, talk to skipper. May be special circumstances that change things. If any debate use SMBs anyway, and if any risk of tangling, at least use DSMBs. Check whether if skipper says "don't need SMBs" that means truly no surface marker at all (rare) or DSMBs ok instead (far more common, and much safer). Don't be lulled into carelessness by calm sea. Tracking bubbles is very hard even in good conditions, and sea can easily worsen during a dive making tracking impossible.

… Buddy-pair the divers

Can be hard to do well. Several factors to consider. Pairs must have right experience. Do any divers need looking after? Buddy them with experienced divers if so. After this, try to get pairs with similar air consumption. Also better to have pair using same suit: both semi or both dry rather than one of each. Try to arrange it so that at least one of each pair has redundant air supply if poss (twins or pony). Ideally have at least one of every pair with either computer or at least ascent rate warning (e.g. good watch or D-Timer) but make sure that if only one computer between two that both divers crystal clear how to dive defensively that way (see PDCs Crammer in download section for advice). Think about diving style: some divers swim like torpedoes, others bimble. Try to match. If anyone has a camera, pair them with a bimbler to avoid frustration. And don't forget comfort factor. Ask if diver happy diving with your buddy suggestion and try to re-juggle if not. Getting best balance quite difficult sometimes. In practice often easiest to start with 'obvious' buddy pairs then see if can fit rest around this. If that no good, start swapping obvious pairs around. Odd numbers mean there will be a threesome. Ensure divers aware that any one diver missing means all three up. Finally – most important point: if can't make safe pairings for everyone, no choice but to stand some divers down. Try make sure that another site available and all get two dives in the end to avoid mutiny, but ultimately safety over-rides all other considerations.

… Keep everything moving quickly

So easy for time to trickle away and end up missing slack, only doing one dive or getting home really late. Make sure all know key timings. In particular if stopping for breakfast, make sure a departure time agreed stick to it. At launch site, marshal should make sure everyone doing something useful all the time. Needn't be high-pressure/hassly, just watch for anyone ambling around looking useless or simply chatting and find them something to do. Good idea to ask questions rather than 'command', e.g. "is your kit ready for launch?" rather than "get your kit ready". Delegate lots: e.g. get others to set up the RIB rather than fall into trap of thinking 'quicker for me to do it as I know how' – others will never learn this way.

… Estimate the viz from the boat

Once in deeper water, look down into the sea where the water shaded from reflections (e.g. close against side of boat). In the UK, generally the blacker the better. If water looks green or milky, viz likely to be poor. In early summer can often see particles of plankton. Prolific fine plankton usually worse than sparse big globs of the stuff. Allow for sky conditions. Bright sunlight shows up particles more so dull conditions can make viz seem better than it is. Watch bubbles from props. Poor viz makes even bubbles near surface look green or brown. Good viz if can see even deep bubbles and they just look darker rather than green or brown tinted. This often gives useful guide to viz on dive, but *beware* that surface viz not a guaranteed guide to viz at depth. Crud can form layers in water at any depth, so good surface viz may yield to awful viz at, say, 15m; and even if poor viz at surface, can occasionally be good at bottom, though will be darker than normal for depth.

… Assess and mitigate risks

This is hard. Most risks covered in training, briefing (below) and material herein. Think about special conditions though: maybe risk of accidentally entering wreck, powerboat races nearby, sudden drops in depth with rotor currents, anything… Very hard to pre-define such risks. Main thing is to cover key aspects from training then **think** for yourself. Take time to almost do mental walk through of dive and surfacing to foresee unusual problem potential. If written risk assessment being demanded, ok, but don't just tick standard sheet (can lull into false security) – think hard too. Main thing though is that where risks identified tell divers how to avoid/mitigate them.

… Brief the divers

Check echo sounder for max depth around dive site and tell divers. Describe site as far as poss. Describe major features (drawings ideal but rarely possible on UK boats), suggest good routes round them for best tour and forward dive profile (i.e. deep first, working shallower). Advise of any hazards: poor viz (see "… Estimate the viz from the boat"), nasty current traps, things from risk assessment and so on. If diving at slack, state when slack window coming to an end and whether likely to be sudden or not (springs or neaps). Based on current dive depths, dive type, slack window and previous dives (if any), set maximum dive time by which divers to be back on surface. If any threesomes, remind that any one diver missing means all three up. Decide if (D)SMBs needed (see "… Know when to use a Surface Marker Buoy") and ensure divers have right kit. If doing drifts in little/no current, tell divers what compass bearing to follow (roughly) so all go in same direction. If doing wreck, describe whereabouts on wreck shot seems to be and what direction best to go in. Make sure divers and skipper all agreed whether divers can/should come back up shot line. If more than one boat on site, agree special pickup signal so skipper can tell his divers from others. Ensure divers know if boat might use Thunderflash diver recall signals and tell to surface immediately (within ascent rate & deco obligations) when they hear the bang. Also note recall signal that may be used if diving with SMBs – club standard normally four strong tugs on SMB line.

… Watch for incidents in the making

Lots of little signs can indicate potential trouble. Watch divers kitting up. Any divers slow or making mistakes – check if dived recently. If not buddy with experienced diver and limit max depth. Watch for anyone glossing over missing accessories (e.g. knife, watch, SMB…), or minor equipment failure. Look out for sea-sickness. Check sufferers carefully and insist on buddy check as these are ones who will miss things. Keep an eye on anyone looking flustered/rushed for same reason. Watch out for unaccustomed buddies who don't talk to each other. Insist they talk through dive plan together.

… Record important info before dives

Rarely done but important thing is to have emergency contact phone number for every diver. Imagine having a serious incident and not knowing who to tell… (skipper may insist on divers logging numbers anyway). DO can provide laminate list of club member contact numbers

to take with you. DO or secretary has them on file too. Important too to note colour of divers' kit. If divers swept away, rescue services need to know what to look for. Note hoods, suits, BCDs, cylinders. If marshalling from the surface, best to make a note of when each pair goes in (wax pencil on plastic best). If diving too (as often the case) ensure that skipper/cox will note times in. Tell divers when you expect them up and raise alarm as soon as cause for concern. Note specially if anyone diving on Nitrox or even Trimix and what is the mix.

… Plan a RIB Dive Trip

… Plan a RIB dive

All comments in "… Plan a general dive trip" apply. Special thoughts on RIB. Plan the diving for RIB abilities. Long sea trips a bad idea if: more than four or so divers; lumpy, windy or cold weather; separate waves of divers being taken; extreme diving being done; lone boat with single engine. Think about air. If compressor convenient during surface interval, get divers to take one cylinder (plus money for fills!). If not, take two and allow for effect on speed of extra weight. Carefully plan timings for state of tide at retrieval slip – make sure enough water at slip for safe easy retrieve when RIB will be back. Check in books of slips/launches. Arrange who will tow the RIB to site and ensure access to boathouse. Make sure dive marshal can get access to box of electronics and trailer keys before the day. Must have electronics available: VHF Radio (check reception and report to coastguard on launching); GPS (NB: waypoint launch site co-ordinates); Echo sounder.

… Check the RIB safety equipment

Well before the day: Make sure anchor in place and rope not tangled. Check Oxygen pressure in Oxygen kit and top up if necessary; Check first aid kit contents all present and in good condition; Check flares still in date (currently Feb 1999); Ensure main boat battery charged. Check drain plugs all in. For engines, need: full fuel tank, full pony tank, plus a spare if planning a long boat journey; Kill cords; Spare prop, split pins and spanner; Spare spark plugs and plug spanner; Spare starter cord. Ideally should also have: Paddles; RIB tube puncture repair kit; Spare SMB reel and buoy; A couple of spare ropes for boat towing etc.

… Prepare shot line info

Best to decide this before the day. Assess likely depth of wreck from books/charts. Allow for tide state. HW springs can add several metres, LW springs much shallower. Decide if can shot top of wreck and thus what depth from shot to surface. RIBs have four lines approx doubling in length each time (3m, 7m, 15m, 30m). Means can make up any length from 3m to 55m about 3m increments – quick and easy. If using separate shot line, measure out line to this depth plus only 10% or so (more than this will cause shot line to be angled and give long swim down). Fix main buoy here. Pay out two or three more metres and fix smaller telltale buoy. Fix shot or grapple to deep end with slightly weaker line so that if shot jams, only lose shot not whole line too. Loosely lay shot line into large bucket in boat from buoyed end first, shot end last. If

deco dives being planned, fix karabiner or similar to line at stop depths for stage cylinders. If desired, also tie thin strong waster cord to bottom of shot line. This allows first divers to tie off shot line to wreck with waster to avoid shot being pulled off, but waster will break with strong pull to allow shot to be retrieved from boat.

… Prepare a break-free anchor

If critical to anchor firmly but likelihood of anchor getting stuck, make anchor break-free. Shackle anchor chain to **nose** of anchor. Run chain loosely along shaft. Fix nearest links to anchor eye with strong cable ties or thin strong cord. Anchor warp tied off to free end of remaining chain as normal. While anchor in use, cable ties pull anchor into sea-bed as normal and anchor bites. In emergency, use very strong pulling or RIB engines to strain against anchor warp until cable ties snap. Chain then only fixed to nose of anchor. More pulling will then easily pull anchor flukes free and lift anchor nose-first.

… Marshal a RIB Dive

… Get into the boathouse

Get large bunch of keys from DO or EO. See map on CPA web site for boathouse location.

For King's Meadow: Have to get to boat through main clubhouse. Heavily alarmed, and alarm linked to Police station. Unlock steel front door. Inside, internal door has alarm key box on it low on left. Turn alarm off. Unbolt door and go through bar area to external door at back. Not locked – go through to open-air pool area where RIBs are. Keys for main external sliding doors in compressor room. Unlock & open main doors to get RIB out. Be sure to reverse whole process to get out and leave all doors locked and alarm on. Alarmed door to be bolted whenever alarm on so can't be accidentally opened and alert Police. **Beware**: height bar above barrier is not high. Can take an ariel off car or damage anything attached to RIB's A-frame. Make sure of adequate clearance before going through. If not, swing open height bar too. If anyone left in King's Meadow leave barrier open. If not, make sure locked after you regardless of how found.

For Swallowfield: Leave main gates in same state found. Panel gates on compound may need spanner to open clamps. If not available try strong finger pressure while rattling gates. When removing RIB, put red flag down gate tube – if neither RIB nor flag visible, staff at yard will assume RIB stolen and notify police and us. Otherwise all fairly obvious.

… Check RIB ready for trip

Before setting off check: Trailerboard lights all working; Trailer tyre pressures OK; Fuel tanks filled; Drain plug in. For trailer, should have: Spare wheel; Tyre pump; Jack and wheel brace; Wheel clamp and keys; Spare light bulbs; For boat itself, must have: Tube inflator foot pump and connector hose; Anchor (one sand, one reef) plus anchor rope; Coastal flare and smoke set (check still in date and not damp); First aid

kit; Oxygen kit; Fire extinguisher; "A" flag; Thunderflash (or similar) diver recall signals; Shot weight plus shot line, buoy and tell-tale buoy.

… Get RIB tubes at right pressure

RIB has multi-compartment tubes. One valve per compartment. Make sure all inflated evenly. Inflating one compartment bends internal walls between compartments outwards. This seems to 'inflates' next compartment but strains inner wall. Important to pump all compartments evenly so inner walls stay fairly straight – start pumping front compartments and work backwards. If RIB/air cold, don't inflate fully – expands as warms up, but when about to launch make sure firm as cold water will contract air an deflate slightly. After dive check not too firm and let air out if so to prevent warmth over-pressuring tubes again.

… Tow the RIB safely

See Towing Law section on CPA web site for details. Important points are that speed limit is 60mph motorways, 50mph other roads if no local limits apply; and can't use outside lane of motorway if other lanes in service. Good idea to have clip-on extension wing mirrors to see behind you properly. More stable when towing if nose of trailer heavy, so put heavier kit in bow of boat. Leave far more distance in front than usual as braking distances greatly lengthened. Swing wide on corners so RIB doesn't cut the corner – very nasty at speed. Reversing's an art! If having trouble, unhitch boat, manhandle, turn car and rehitch.

… Set the RIB up at the launch site

Remove all transport straps, prop protectors, and untie painter from trailer. Fit any electronics from bag then test. Remove spare wheel/jack etc and leave in someone's car. Open tank vents. Lift engines prior to launch so props clear. Check drain plug in. Check kill switches fitted securely. Pump up tubes if necessary (see "… Get RIB tubes at right pressure").

… Launch the RIB safely

Check engines raised. Normally best to launch RIB light and load heavy diving gear once afloat. If steep slip/sea-bed though, may get away with kit in boat during launch. Important to get one or more divers to guide you back, as impossible to see behind you & often children around slips. Gently reverse rib & trailer into water as far as possible without putting tow car at risk. Brake car securely. Ideally turn engine off and put into gear. Release winch strap and try rolling RIB off back of trailer. If water not deep enough, may be hard. Raise bow off trailer and try again. If still no good, release trailer from car and roll further into sea. RIB will float off ok then. While loading up but before engines started, radio coastguard with dive plan as in "… Radio coastguard with dive plan"). NB essential not to forget to radio again on return to say safely back. Care with "momentum trick" to get RIB off trailer quickly in shallow water. Release strap while still on slip. Roll car back into water then at last minute apply brakes sharply to roll RIB off trailer. Essential to have lookouts and be sure water deep enough for this. Must time it perfectly too. Take great care this way. Once launched and loaded, drop engines. Prime carburettors with line pumps and pull-start engines. As soon as

started, check water coming from tell-tales and if not stop engines immediately. Running engines even for a few seconds without water can destroy coolant impellers and if for longer rapidly overheats engine and damages it.

… Radio coastguard with dive plan

Always try to notify coastguard of intentions before all dives. Example dialogue as follows.

<Check VHF on channel 16>

You: "Portland Coastguard, Portland Coastguard this is CPA 2, CPA 2 – over".

C/g: "CPA 2, this is Portland – change to channel six seven"

You: "Roger Portland six seven"

<Change to channel 67 and wait a few seconds>

You: "Portland this is CPA 2 – we'd just like to notify you of our dive plan for today, over"

C/g: "CPA 2 this is Portland – go ahead, over"

You: "Portland this is CPA 2 – we are a party of 6 divers, 5 experienced and 1novice on a RIB. We've just launched from Bowleaze cove. We'll be diving Lulworth Banks then a second dive at Ringstead reef before returning to Bowleaze. Estimated time of return is around 15:30, over"

C/g: "CPA 2 this is Portland – which part of the banks will you be on, over?"

You: "Portland this is CPA 2 – we'll be fairly central, around the Lulworth Cove area, over"

C/g: "Thank you CPA 2 – please let us know when you are safely back. Portland out."

<Set VHF to dual watch>

… Avoid prop damage

Very easy to trash prop on rocks. Main avoidance is to know safe channels between slip and sea. Learn buoyage and get advice from locals. In all circumstances, keep eye on echo sounder and if gets below three metres or so take it very easy wherever you are. Learn to read sea surface. Sudden shallows increase local wave height and often lead to them breaking. Currents kick up over shoals and can be seen on surface. Colour of water can vary with depth in some conditions. Once in shallows, don't rely on echo sounder to avoid prop damage – transducer is at rear of RIB so by time sounder screen shows too shallow, props will have already hit. Have to position lookout on bow to watch sea-bed. If viz bad, have probe (paddle/flag pole) in water off front. As soon as lookout warns of shallows, shut throttle and take out of gear. Drift or paddle past obstruction until safe to re-engage props. For long distances in shallow water, get divers out and walk RIB to deeper water. With full trim/tilt engines, can also lift engines and operate props just below surface, though efficiency awful.

… Use the GPS

Manual available. Read that first, but best way to learn is to use it. To get best out of it, find out Lat and Long of dive site and program this as waypoint before setting out. Get someone who understands GPS to show basics then try to use it to get to dive site.

… Use the Echo sounder

Again, manual available for basic operation but experience counts. Get used to display and what to look for on good sites. Biggest thing to understand is effect of different sea-bed depths. If scanning 40m deep, even small lumps in trace may be interesting. If only 6m deep, even big lumps can be small boring rocks. When pinpoint precision needed, remember that reading is from point of transducer (normally at rear of hull), so boat has already passed over whatever on screen. Do several passes if shotting a wreck so can predict best place to let shot go. For same reason, don't rely on echo sounder to avoid prop damage. Will be too late by time on screen (see "… Avoid prop damage"). Don't be fooled by big pings appearing on scan while divers down. Divers and even their bubbles reflect sonar and can seem like big wrecks or reefs – and deeper divers can be under boat even if SMB or surface bubbles well away.

… Find interesting sea-bed

Best bet is to study books/charts and get co-ords beforehand. If just looking on spec, use simple rule of thumb: unless hunting flatfish, the more varied the se-bed depth, the more interesting the dive. Rare that ridges/gullies less than a metre or so are very interesting. Remember to look at numbers more than trace on sounder – depth variations on trace *look* shallower the deeper the sea-bed. Drop-offs often good. If known there's a drop-off/ledge in the area, generally ridges follow coastline so best to head straight out to sea (or straight for shore if on deep side) watching sounder. Normally, steeper walls better than gently sloping drop-offs, so try to find the most sudden changes in depth. When dropping divers in, make sure they know whether on high part or low part, and which direction to head to get to wall.

… Find a wreck

Research first. Look in books and on charts to get depths & locations. Need to get to close vicinity using GPS, transits, or triangulated compass bearings. Once in right area, set up search pattern, criss-crossing the area. Use GPS plot mode to see where RIB has been/is going. Watch echo sounder all the time. As soon as large disturbance seen, turn and criss-cross the wreck. Use GPS plot to see where main bulk of wreck is. Once best dive location identified, drop shot (see "… Deploy a shot line"). Very big wrecks in 30m or less and with current running (e.g. Aeolean Sky) can sometimes be located by sight. Currents well up over wreck and typically smooth the waves. Forms distinct patch of visibly different sea surface. Start looking up-current from this patch. Can also find wrecks closer inshore if one good transit by heading out to sea precisely along this transit and watching echo sounder carefully. For shallow wrecks, can also do snag search. Drop shot overboard and drag along sea-bed behind RIB. As soon as it snags, let go – that's probably

the wreck. First divers down should make shot secure so it doesn't pull of wreck.

… Deploy a shot line

Mostly to do with timing. Get someone watching sounder and someone else to release shot. As soon as right part of wreck appears on sounder, yell release. Feed line quickly and make sure buoys don't snag as whole line plays out. Check shot in right position. If too much slack line, good idea to gently motor the RIB up current, gently reeling in spare shot line, then reposition buoy so line as vertical as possible without pulling shot off wreck. Useful if current running too fast too, as on release buoy will be pulled under. When it surfaces, you know current slack enough to dive.

… Drop divers in the water properly

Ensure divers completely ready to dive and checks complete. Run RIB up-current along shot line parallel to line of main buoy and tell-tale buoy and one or two metres away. Go past tell-tale then on past main buoy for three or four metres, readying divers. Then throttle back, take engine(s) out of gear and yell for divers to go. As divers drop in, will have enough time to get upright and drift onto main shot buoy. If divers miss the buoy and drift past it, do not just tow them back to it. Far too easy for diver to slip free and get chopped by props. If little current, good weather, no waves, no other dive boats around and not drifted far from shot, acceptable to tow a them **in reverse only** for a short distance at slow speed. This way if they slip free, the props move away from them. In all other situations, get them back into RIB, re-kit and do the drop run again.

… Secure shot line to wreck

In calm conditions with experienced divers, no need to. If risk of current or divers pulling shot off wreck, best to secure it. First pair down to descend without pulling on line. At bottom, can tie off shot with waster cord (see "…Prepare a shot line"). If shot weight is an anchor/grapple, better still to loop anchor back up and secure to shot line by flukes so no risk of snagging when waster breaks. Good idea too if first pair takes small signal float down to release when shot secure so other divers know when ok to use shot line. If no waster, have to have first pair wedge shot/anchor into wreck, then last pair release it so will pull out cleanly.

… Retrieve a shot line

As long as carefully pre-planned, last dive pair to come up can use as shot line as deco buoy. Free shot end completely from wreck and ascend up line. Divers drift with shot buoy and RIB tracks as for SMB. Vital that no risk of other divers left on wreck before doing this. Only safe way is if last pair were only pair of second wave. If all divers up before lifting, but shot jams, try motoring RIB round at different angles. At same time, apply strong tension then release totally. If no joy, will have to lose shot by breaking line free and leaving shot (assuming weak link at shot end – see "… Prepare a shot line"). If shot comes free ok, can save much effort by power lifting it using RIB. Have large buoy with wide diameter steel ring underneath. Feed shot line through this and leave buoy free in

water. Pull loose end of shot line until taught. Attach to RIB and motor off. Water drag will keep big buoy from moving fast and RIB will pull shot line through ring. Shot weight will come to surface. When weight hits buoy, just maintain tension and pull weight plus buoy to RIB. Tornado shot weight has lifting bag attached just big enough to lift lead weight. Last pair down can inflate fully and send up, or put in air until shot starting to lift and leave it as marker for cox. When retrieving, very little weight left to lift.

… Track divers underwater

On drifts, divers must use SMBs. Never try to track on bubbles. Extremely easy to lose bubbles even in calm conditions. SMBs usually no problem, but can be an issue if no current and two pairs go in opposite directions. Can easily end up widely separated. Easy to lose sight of one SMB here – especially in swells. Best avoidance is to tell divers which way to go so all go same way. If happens anyway, try to track both by shuttling between and using GPS to track positions. As soon as any hint this is getting hard, must recall at least one pair of divers. Far too dangerous to just hope to be able to find second pair after first pair surface. Don't forget too that second pair can drift a long way just while getting first pair into RIB. Don't take risks. Short dives far better than lost divers.

… Recall divers in an emergency

If several divers down and divers surface in trouble, or for any reason RIB has to leave site urgently (e.g. to answer Mayday, or sudden worsening of weather), may need to get remaining divers up in a hurry. If diving with SMBs, troll round buoys (**great care needed** as divers may be surfacing) and give agreed signal by tugging on lines. Club standard is four strong tugs. Can also use Thunderflash type signals. Humber boat box contains a pair. In emergency, light striker and release into water. Tornado has special re-usable recall signal on reel – read instructions. Remove safety lock and lower on reel. Once below 8m or so, will detonate. Either way, loud underwater bang alerts divers and tells them to surface. If no other method available, go near to divers and rev RIB engines repeatedly – divers often take this to mean cover boat getting impatient. If no recall signal or too shallow etc., use fast-idle lever (**not** throttle) to rev engine repeatedly. Make sure divers know in advance this also means recall when they hear it underwater.

… Pick up RIB divers

If no wind, better if divers separate and let RIB go between them. That way more space to get them into boat from opposite sides. If windy, better if both on same side of boat so RIB can approach up-wind to be blown toward divers when engines cut. If divers surface in wind and well apart anyway, approach upwind of both and let RIB blow toward them. Approach very slowly once close then as soon as no doubt they will connect with RIB, throttle back, knock out of gear and **ensure lever locked** (RYA recommends killing engine, but club recommends leave idling so no risk of not re-starting). If one diver connects but other starts drifting away, get one diver in quickly then go for other. Only if positions right and conditions good, acceptable to tow first diver **in reverse gear only** and at very low speed to get second diver to boat.

Under no circumstances tow a diver in forward gear. Otherwise, release first diver again, tell them to swim towards each other then do another approach run. While picking up divers, always keep watching out for other boats and other divers surfacing.

… Retrieve the RIB

On way back, make sure as much water out of RIB as possible. Once back at slip, best to unload heavy gear and walk it to shore before retrieving RIB. Only in calm conditions with good grippy slip and deep water at base of slip will laden retrieve work. Kill engines and lift out of water. Back trailer into water as far as possible without putting tow car at risk. Unwind winch strap and hitch to RIB bow eye. Align hull carefully with rollers and winch onto trailer. If gets hard near end of travel, sometimes helps to lift nose of trailer high, winch RIB on and pull trailer back down. Hitch trailer to car and tow out of water and drop engines back down. If slip base shelves too gradually to float RIB onto trailer, try manually pushing trailer out into deeper water and winching RIB on there. Attach rope from trailer to tow car on slip. Tow RIB to base of slip. Important now to stop, chock trailer with rocks, and bring car back down slip to attach trailer properly. Very hard to control a trailer attached by long rope – dangerous: don't do it. Once back in car park, remove electrics, refit straps, tie painter round trailer nose as security, strap tiller to side of RIB to stop it swinging in transit, attach prop covers, and remove drain plug to let any water out from hull. Refit before setting off to prevent loss. If experienced boat-handler on good slip at fairly steep angle with deep water at bottom, can drive RIB onto trailer. Raise engine trim so prop and intakes just in water. **Never so far that telltale stops** – always check. Align bows gently with rearmost roller then gun engine to thrust RIB up to nose of trailer. Kill engines the moment intakes out of water. Hitch up as before.

… Garage the RIB

Once RIB back at boathouse, engines need flushing with fresh water. Best way is to pump prime both carbs and disconnect fuel lines. Attach "ear muffs" to engine water intake just above props and feed with fresh water from hose. Once water running, start engine and immediately check tell-tale has water coming out. If not, stop engine instantly and find out why. If so, leave engines running until carbs run out of fuel and engine stops. Repeat with second engine. Hose down the RIB inside and out, and flush plenty of water round trailer – especially wheels and brake drums. Cover with tarpaulin and secure boat house on way out.

… Run a Hardboat Trip

… Book a hardboat

First thing is timing. Good hardboats often booked during high season a year or more in advance. Book early. Decide region dive wanted in. Find contacts in region through: web listings (see http://www.cs.bris.ac.uk/~wood/Skippers/index.html) talking to other clubs, scuba-uk e-mail, books and guides, dive shops in harbour towns, scuba mags, or tourist offices. Try and get references from others – dive

boats & skippers very variable. Next, ring around. Check dates are available and suss boat out - got oxygen, weather shelter, toilet, drinks included, even compressor on board? See if skipper also a diver (beware if not). Can skipper recommend local B&B? Ask about typical dive sites and see if skipper ok about three dives if time (some aren't). In particular agree booking/cancellation policy. Most book whole boat fixed fee (typically around £300-350 per day at 2004/5 prices). Fewer divers turning means problems for club. Some book per diver at typically £35 per day per diver for two dives. Better for club. Confirm cancellations policy. If divers/club cancel, usual to forfeit deposit. If skipper cancels, must get deposit back. Big problem area is weather. If borderline and skipper says ok to go out, can lose deposit (or more if terms harsh) if club says no. Best bet is to make clear that SAA state that not safe to dive over force 4, so agree that if forecast has fives or higher, trip cancelled without penalty. Don't book if skipper not happy about this. Once all agreed, skipper will want deposits. May send you a booking form – read carefully and if not got cancellations as above, write your own terms on it (force 5 or above = undiveable weather). Return form with deposit cheque (from club treasurer). A month or so before trip, ring skipper just to confirm trip and maybe advise whether you want skipper to pass fill-in divers onto you if numbers low.

… Book club divers onto trip

Really, best to get everyone to pay in full before the day, then just need a club cheque to pay skipper. Good approach "deposit £35 per day but diving free on the day"! Traditionally CPA takes deposits only then gets balance off divers in cash on the day. Tedious for dive marshal this way – avoid if poss. Make it clear that once anyone paid deposit on trip they're expected to pay in full whether they turn up or not. If they notify early enough, may be able to sell place on, but no guarantees.

… Find fill-in divers

Club can lose huge amounts of money if day-charter boat not filled. If boat looking light on club bookings a month out, get fill-in divers. Good idea to keep lists of such people to ring. As noted above, tell skippers you're short & they can often pass divers on to you. Some dive shops can point divers your way. Old Harbour in Weymouth tend to act as a broker for local dive boats – worth a ring. Use the internet too: the "ndg" e-mail group's good, newsgroups, key web sites, SAA pages … Finally, trot round local dive clubs. CPA traditionally shares dives with Slough SAC (SAA) and Reading BSAC – contact their DOs. If dive is more than a month away, consider building up an "interested" list then having last tout round club. If within a month just take deposits from fill-in divers a fill boat (if CPA members won't commit early enough, afraid they lose out).

… Marshal a hardboat trip

See "… Marshal a General Dive" for guidance. Biggest difference is that hardboat skipper has they say on all aspects of how boat run. Safety decisions that relate to boat his decision too. Safety of divers is the marshal's job. Take advice from skippers – invariably good, but if you and skipper disagree go for most cautious option. E.g. if any debate about whether to use oxygen or call helicopter, best to do those things

than take a chance. Dive marshal will be facing coroner's questions if anything goes wrong with dive safety so be insistent if skipper not taking things seriously enough.

… Pay for a hardboat

If everyone paid in full before the day, just need a fully completed club cheque to pay skipper. If only deposits taken from some/all divers, club has to pay uncertain amount with a cheque. Marshal must thus get cheque ready signed from treasurer well before day. Will have to be "blank" amount in this case, but if **ensure payee is filled in**. If not got full amount in advance, then on day of dive get balances off divers. Give skipper cash/cheque for full balance.

… Balance payments with club after

If marshal taken cash off divers on day of hardboat dive, can be the case that surplus (from rounding up on per-person amount) or deficit cash (from no-shows). See club treasurer after dive and make good difference. Even if balances on the day, tell treasurer immediately how much the club cheque was for. Treasurer will keep balance of income/payouts for trip anyway and will check if in deficit and why.

… Run Speciality Dives

… Run a Camp-Dive Trip

CPA often does camp-dive weekends. Fairly obvious how to organise but one or two extra things to think about for diving. Make sure space to park RIB near tents. Obviously campsite near a good slip is ideal. Warn people to take warm clothes – non-regular campers always optimistic about summer night temps. Barbecues good if plenty of time or non-divers happy to organise. Ensure easy to get air fills after the days diving. Watch out on 'expense' make sure everyone contributes to towing fees, boat fuel etc, even if just 'dropping in for the day' not staying all weekend.

… Run a Shore Dive

Try to forecast likely surf condition on the shoreline. Big surf makes entry/exit dangerous. Use weather forecasts for wind conditions. Pay attention to whether will strengthen of slack off. If onshore breeze, much more likely to have bad surf than offshore of same speed. On south coast, winds from northerly direction best. Can be ok in sheltered bays like Swanage in most winds. Check that enough air taken or you know where nearby station is. Marshal should take oxygen and first aid kits, especially if in isolated spot. Plan to have at least one person on surface cover with rescue capability. When marshalling a shore dive, current situation critical. If any risk of current, should have boat cover of some sort. If never a current problem (e.g. Swanage, Chesil Cove, Burton Bradstock), ok with just shore cover. Use SMBs. Brief divers on entry/exit point and orientation. Get everyone to check compass bearings to know which way to head back to shore. Note that if currents do pick up, best

to stay on seabed during swim back – stronger current mid-water. Also can use rocks to pull on if bad.

… Run a River Dive

Strictly speaking should OK a river dive with the Environment Agency well in advance – like a month. They notify lock keepers in writing to warn boats of divers ahead. EA's river diving rules are: follow EA officer instructions; have licensed boat cover; have fully kitted shore cover all times; display A-flag all times; post lookout to warn approaching boats; no diving within 50m of lock or bridge; never obstruct craft; archaeological finds must be sent to EA; confirm dive with EA the day before. Some of this unrealistic for clubs. Alternative is to be practical. EA only real concerns are that we're safe and don't cause problems for other river users. In practice can meet these aims largely by finishing dives before 8am when locks open. Rarely any boat movement before then. Also, EA patrols not out yet! Do consider fishermen though. Don't dive anywhere near lines and best to chat to them first to establish rapport and ensure no potential problems. Most very amicable, but any problems & back off – they've got more rights unless we follow all EA procedures to letter. Beyond that, just stick to standard dive safety procedure. Use SMBs, always have shore cover, should take safety kit (oxygen, 1st aid & mobile phone) and so on. Big difference with river is solo diving. Viz often so poor and rarely depths beyond 4m means that buddies often more a hassle than safety factor. Serious potential for getting tangled though, so if solo must have good knife and redundant air supply. Also, marshal's briefing to tell shore cover to watch bubbles – if in any trouble give good purge of DV to tell shore cover to come help (alternative: repeated, regular strong tugs on SMB to make it bob rhythmically). Check river conditions before dive. If currents strong, forget it. If marginal, tether divers and get shore cover to play line out/in. If divers do hear boats, best to stay glued to river bed – ample clearance in decent rivers. Surface cover to warn boats to stay clear of SMB. Navigation easy in rivers as current and depth give direction and position across river. Only unknown is position up/down river but not a problem. Best bet to work upstream. Means you can drift back to exit point easily and also that kicked up silt carried away from you, improving viz . Marshal to warn divers of potential for Weil's disease. Any flu-like symptoms within days of dive means go to Doctor and advise been river diving. Wash kit down after, just as if salt water diving, as organic crud and micro-organisms no good for kit/health either.

… Run a Lake Dive

If not a private lake, will be covered by Environment Agency so most comments on river diving apply equally here. Private lakes have own rules. Talk to lake operators about procedure and adhere.

… Run a Night Dive

Good weather particularly important as easier to make mistakes. Make clear that dive can be aborted if not good. Poor underwater viz not necessarily a problem, but dive probably no fun anyway. Poor surface viz a real hazard – don't dive in fog, heavy rain etc. as too easy to lose divers. SMBs should have lights on (Cyalume sticks or battery beacons) else quickly invisible. Some shallower dives in good conditions and clear

viz (e.g. tropics) ok without SMBs as underwater torches easily seen from surface. Briefing and buddy checks very important. Before getting on-site, warn about night vision. Takes at least 15 mins of near-darkness for vision to adjust to low light. One strong torch in eyes, or car headlights can destroy night vision for another 15 mins. Advise that all divers check torches before kitting up and turn headlights off & use dim light while getting ready. When ready to dive, eyes will be well adjusted for night vision. Divers should have two torches each – one backup. Don't use head-mounted torches on night dives as one glance at buddy destroys night vision. On dive, never turn torch out as bulb most likely to blow when turned back on. If want to black out torchlight (e.g. to see photoplankton flash), put torch head against body or cover with hand. If rechargeable batteries, make sure topped up. If disposable, put fresh batteries in regardless. Agree torch signals. Signal with beam on seabed where buddy is looking, not in face. Common signals: rapid side-to-side movement underwater – attention/look this way/maybe problems; same signal on surface toward shore – problems come get me; slow large circle – ok (like finger & thumb circle); steady beam straight up at surface of water – alarm to surface cover (most torches balanced to do this if let free for this reason). When giving hand signals, shine torch at your hand so buddy can see it (tricky if two-handed signal – tuck torch under arm). Doubly important for buddy to confirm signal by repeating it – easy to misunderstand in dark. Buddy checks specially important as easy to miss things at night. Go through religiously and test things work. On dive, pay special attention to navigation. Less cues with sunlight. Easy to get disorientated. Also very special care with depth. Colours and ambient light level don't change with depth like on available light dive. Very easy to be a lot deeper than you think, so watch depth gauge very often and check buddy is too. Same lighting issues makes it easier to go inside things like wreck holds or caves without realising. Shine torch all around regularly to check. After dive & de-kit, make special torch search of whole area to ensure nothing left behind.

In Conclusion

That should give you most of what you need to know and lot more besides. The rest is about getting out there and doing it.

Go for it.