

DORY PROJECT CHAT SHEET #4: TOOLS

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It would be *possible* to build this boat entirely with manual tools – saws, planes, files, chisels, drills, but it will obviously be a lot easier with power tools. My workshop is pretty well equipped, after being an owner-builder and after many past DIY projects. Even so, a check of my tools suggested need to replace a couple of old favourites that had given past faithful service.

Power Planer

I had an old, small electric hand plane for which it seems – after many years - I can no longer buy replacement blades – ah, age is occasionally a bad thing - which is pity because it has been a good tool. Even though it's fiddley to do, I can still put an edge on the old blades, on a stone, but the depth adjustment on the body is worn and stubborn, and alas its days of doing fine work are over. That meant buying a new plane. I acquired a new and larger sized model. Going to really big power hand planes needs Gorilla-sized wrists to control them, and I'm only light-to-medium in frame, so couldn't see the point of going over-sized.

I have a very old but perfectly functional bench planing unit with a half horsepower motor, mounted on a mobile trolley, ideal for cleaning up the faces on long timber sections (like stringers), so I'm pretty well covered. This old tool belonged to an uncle who passed away some years ago, and it was passed to me via my father. I recall many years ago, when I was a little kid, my uncle used it when building a 'bondwood' boat. He did a nice job of it too. With a base frame of cast iron, and lovely steel in its cutting blades that really can take and keep an edge, this old tool is a reminder of the wonderful quality we used to get in the 'good old days' in serious woodworking tools. Progress is terrific, and I love some of my modern power tools, but I have a nostalgic fondness for the old tools. I suspect they can't afford to build them like that anymore.

If you don't already have a power planer, my suggestion is not to buy the 'smallest' size available. Go for at least a medium sized one – and honestly, get a Ryobi or Makita, not a 'cheap' brand. Another tip – when you buy it, buy a couple of spare drive belts for it. If you use it a lot, you'll inevitably need them over the life of the tool, and spare parts for tools have a sad way of becoming 'unavailable', a few years after a product release.

Oh – and if the brand you currently think you might like best doesn't provide spare drive belts that are actually easy to source and purchase – pick another brand as your favourite! Don't encourage the bastards who produce tools without providing spare parts likely to be needed across the fair life of a tool! In my experience, brands like Bosch, Ryobi and Makita can and will provide essential spares like drive belts – just be a bit insistent with your local retailer, and make them do their job for you. It's actually in their interests, because you'll almost certainly go back to that retailer, next time you need a tool. What goes around comes around!

Belt Sander

It's the same deal for me with belt sanders – I don't go over-size. I have a small one, and a medium sized one. I tried a biggest-size wide-belt one at a trade tools demo day, the sort you see on some building sites, and crikey, when I tried it, it began pulling the trial length of timber from its clamps, and nearly ripped my arms off! It simply had far too much power, for me.

Professional builders are tough guys, with muscle tone and staying power, doing this stuff every working day. I envy them. For those of us not out there doing hard physical work every day, and lacking the muscle power and stamina that is so characteristic of professional builders, thinking 'smaller' is prudent for User Safety when it comes to power hand tools such as planers, circular saws and belt sanders – all of which are needed for this project. Get a tool size appropriate to your body!

As with the planer, don't get a 'smallest size' belt sander. Get a medium sized one, in a better brand, not a cheap one. Check first at the store where you intend to buy it, to make sure they have good stocks of the sanding belts that fit your sander.

I tend to buy bundled lots of sander belts, in rough, medium and fine grains. Years ago, I used to buy them in twos and threes, but I got sick to death of starting a quick little job, only to find I'd run out of sander belts, obliging me to delay the job until I'd visited the hardware store. That doesn't happen to me anymore. If you're going to take on a project like this Dory, buy a big stock of sander belts.

Oh – and what I said above about spare drive belts for planers also applies to belt sanders. Don't encourage them that don't or won't provide such essential spares!

Electric Drills & Built-In Obsolescence

While building the project work bench, to my surprise and annoyance I had one of my good cord-type electric drills die on me. This was one of those drills with a push-down button on the upper body, just aft of the chuck shaft, which you depress to hold the shaft in fixed position, so that you can manipulate the chuck with your other hand to change drill bits. It's only a couple of years old, and it's certainly a 'better brand' tool, so having it go belly-up was very disappointing. The inner lug/s on that plastic (!) button obviously wore out or plain broke off, and suddenly I could no longer work the chuck. Damn! Apart from that silly plastic button, there is absolutely nothing wrong with the drill. And of course it's out of warranty, and from a quick web search it seems replacement plastic buttons are 'not available'. What a waste!

Despite that, the replacement drill is the same brand because they've been good value to me in the past – but the new one has a dual collar chuck for quick release, not a silly plastic button that is bound to break. Was that built in obsolescence? Why oh why do they do that to us? I note though that none of their new models have that silly plastic button system for locking the shaft, so maybe they do care about consumers and learned their lesson?.

The lesson: when buying drills, do not buy one that has a plastic press-button device for holding the shaft, to enable manipulation of the chuck. Get either a drill that comes with a traditional metal chuck key, or one that has a dual collar chuck for quick release. Also get a drill that has a reverse gear – you'll find this function invaluable.

In my kit, I have cord-type drills with both 3/8 and half inch (12.7mm) chucks. They never did seem to get around to defining drill chuck sizes in metric terms eh? Since you can get drill bit sets with step-down shafts for bits over 3/8ths of an inch, and the majority of drilling work uses under 3/8 inch (9.5mm) bits, not everyone will need a drill with a half inch chuck. However – cord-type drills deliver better power, and they really seem to last a lot longer, than cordless drills, so they're worth buying.

In cordless drills, yes, get one, because working on a boat project they are absolutely useful – but I absolutely recommend against getting the silly toy-like small ones! What a waste of money they are! Get a tradesman quality one with at least 18 volt batteries, and make sure you get at least two batteries so one battery can always be on charge when you're busy. The ones that have a reversing function are definitely best. Just do not buy a cheap brand cordless drill, unless you plan on buying two of them while you're in the shop....because you'll need the 2nd one as soon as the first one dies on you, likely in the very near future. Buy a decent one in the first place. My Ryobi 18V one is a beauty, came with two batteries and a decent charger and, bought on special, it was relatively inexpensive. Christmas is THE best time to buy such things, by the way – as if you hadn't noticed.

Avoid Cheap Rubbish in Power Tools!

When it comes to power tools, I learned long ago that you get what you pay for. There's no point in buying 'cheap' power tools because most of them are rubbish and, even for occasional handyman use, they simply don't last. They're just a waste of money.

It's better to pay that little bit more for one of the better brands in the first place – like the ones the tradesmen use. My kit includes tools from Bosch, Makita, Ryobi and Ozito, and this stuff generally lasts pretty well – excepting the unfortunate demise of the drill noted above.

Chisels, Good Steel and Stones

Amidst my tools, I have some long-cherished old chisels. These are old enough to have decent steel in them that one can put a beautiful cutting edge on, unlike more modern chisels that are face hardened/tungsten treated to keep a working edge – one working edge - but then are darned near impossible to sharpen well again, if you ever happen to chip that edge on something like a hidden nail! Such things make me weep. Every time I go near antique, bric-a-brac and junk shops, I keep my eyes open for old chisels! If you can find an old set of chisels, you'd do very well to buy it.

A year or so back, one of my favourite tool shops was having a big clearance sale, and I picked up one of those boxed sets from a well-known British brand toolmaker at a give-away price – but I bought it primarily because it came with a small good quality wooden mallet. With the chisels, I take extra care to keep them away from any metal.

My old mallet has seen over 30 years of work, is large, and I'd long wanted a smaller one as well, for fine chisel work. Yeah, I'm old fashioned, and I never use a steel hammer with a chisel – except the newer styles, which come with a moulded impact resistant handle with a steel plug – using a wooden mallet on them dents and ruins the mallet! For chisels with wooden handles – get a wooden mallet.

A few years ago I went to one of those tool discount stalls at a country fair, and they were selling sets of chisels with big wooden handles with 'Made in China' stamps on them. They were so, so cheap! I bought a set, thinking to use them just for rough building work but, to my surprise, I discovered that they're obviously made the old fashioned way, using half decent steel that can be sharpened on a stone, and keeps its edge pretty well. The handles aren't too robust, which is a pity, given the reasonable quality of the blades. But you can always buy new handles, if you hunt around. The ones with metal bands (not the cheap/nasty pressed tin caps) on both ends are best.

If you happen to get a half decent set of chisels that don't have metal rings at all, or do have the silly tin caps, at least at the mallet end of the handle, get rid of the silly cap, and replace it with a narrow piece of old water pipe – fashion the end of the handle to get it to fit, and sit the metal edge about 2mm below the striking surface of the wooden handle. A small hole drilled through the ring, and a short fine gauge nail will retain it. That will make the wooden handle last a long time.

If you're going to be using chisels, you need a good sharpening stone. The reason is simple. Blunt chisels don't cut the wood, they break it and inevitably make a mess, and you find yourself belting them, to try to get your cut done. That's dangerous. Trying to force any cutting tool is a formula for accidents. It's far better to stop and sharpen the chisel, on a proper flat stone. I've used a wet stone for many years but more recently I acquired an Arkansas dry stone, and I must say it is excellent for creating a fine cutting edge on chisels and manual plane blades.

With the notches necessary in the bottom frame members, to take the keelson and parallel sister keelsons, and later work for deck beams, and the superstructure, the chisels will get plenty of work.

Power Saws

Other tools that will get a bit of use on this project are my hand-held circular saw, and my bench and draw saws. The bench saw can be finely adjusted to different angles in the vertical plane, allowing me to do things like rough-cut the face angles on the frame uprights, rather than needing to take it all down using a planer. I could do the same thing with a bit of

care using the circular hand saw, which can also be angled vertically, but the bench saw is far more accurate.

Same with the draw saw – which is a combination sliding-rail cross-cut and drop saw. It has a 300+mm circular blade, so can cross cut larger timbers than my hand circular saw, and it can be accurately positioned to any angle in the horizontal plane – a feature that will be very useful for doing all of the angled flare cuts on the ends of all timber pieces for the station frames. These combo cross/drop sliding-rail saws sit amongst the more heavily used tools on any building site, because they're so flexible. My draw saw actually hasn't had a lot of heavy use, because I acquired it after my owner-builder project. I bought it to replace a drop saw that was pretty well worn out after my house project. During this project though, it will earn its keep.

Clamps, clamps and more clamps

In any boat project, one tool that is essential is clamps. And I mean LOTS of clamps, of different sizes. When it comes to tasks such as fitting longitudinal stringers, like the chine log and the sheer clamp, along the curved edges of the plywood sheeting that form the topsides, lots of clamps are needed to ensure the timber is connected properly to the ply surface during gluing. In this project, epoxy glue is the primary fastener, so lots of clamps are essential. [But remember – effectiveness of epoxy glue depends on some of the glue remaining in the joint, so the clamps only need to be done up with light pressure, sufficient to hold the pieces together, but not so much pressure that all of the glue is squeezed out].

Luckily, from past DIY projects, I've accumulated a lot of clamps of varying sizes – but I may need to acquire more, with the thought of working with an 8.5 metre sheer clamp! The good news is that packs of clamps are inevitably on sale at a hardware store somewhere nearby, and they're not very expensive. If contemplating a boat project such as this one – start acquiring your clamps now.

Long tape measure

A long tape measure is also essential. The longest one in my kit was only 6 metres – and that's just too short for this project. I now have a good quality ten metre tape measure.

Once you have the shaper frames in place between the plywood topsides, using the outside-in building approach, it's wise to constantly check that the other station frames are square, as you insert them. Triangular measuring is the smartest way to do that – a centre line nail at the forefoot end of the stem plank provides a constant measurement point from which you can quickly and easily check that a frame is square by measuring to each end of its cross beam. When the two measures are the same, you know you're square. On a hull this size, you need a long tape to do that. Sure, you can use a bit of string, but the tape measure takes the guesswork out of adjustments, so it's quicker.

Straight Edges

A long straight edge is a prerequisite tool. Along with a 1 metre metal ruler, I have several longer pieces of thick aluminium and steel, originally the mounting straps for the moving edge mechanism on an old professional drafting table, and they are excellent as straight edges – because they *are straight*.

A good alternative for marking long, straight lines on sheet ply is a new piece of box-section aluminium, readily available from hardware stores in various lengths. I acquired a section of it, to use as a fairing edge across the chines, for the work necessary before installing the ply for the bottoms. Unlike a flat metal strap even 3-4mm thick, there's little or no 'sag' in a length of box section set across a gap, making it better for straight/square fairing work.

For fairing curved surfaces, you will need a good fairing batten – a long, straight, thin piece of timber that is flexible but reasonably robust. My timber merchant cut some 40x20 stock for me to use for scarf-joining to create chine logs and sheer clamps. These were cut from thick

Celery Top planks, of a width that, after cutting out the stock, produced some long and thin (40x 4-5mm) residual off-cuts. When asked if I needed them, of course I said yes because with such close, straight grain, these strips make ideal fairing battens.

Bevels, Protractors & Squares

To build the dory, you will definitely need an **adjustable carpenters/shipwrights Bevel**. You need this for taking angles – and you need a protractor for measuring the angle you set on the Bevel. Don't just take an angle and transfer it from the bevel onto your next work piece. It's good workshop discipline to keep a written record of the as-built structure, so keep a notebook handy and write it down. This is especially relevant to the process of determining the angles of the outer edge faces of station frames forward of amidships on this dory hull.

You can buy adjustable builders bevels from any hardware store. The new-age plastic handled ones are incredibly cheap, and perfectly functional, but just make sure that the wing nut effectively tightens *without eating the plastic*, to hold the metal blade once you've set it at an angle. Either polish the bottom face of the wing nut on a wet stone, or add a washer if you have metal turning on plastic and cutting into it.

Best way to go – prow! the antique and collectables shops that deal in old tools and look out for an old wooden handled bevel with brass face and slotted blade....buy it, treasure it, use it, then bequeath it to your son or daughter. The old shipwrights that built Clinker (lap-strake) and Carvel hulls used to have quite small planking bevels, in different sizes to get into difficult spots, so if you come across any small brass shipwright bevels – please buy them, and send them to me – joking – send them to the nearest Maritime Museum, to preserve these precious little pieces of our maritime heritage.

Hey – if you ever do need, but can't find, a *small* shipwrights bevel, whip into a car parts place and get a riveted set of stainless steel feeler gauges intended for engine gap measuring. So long as the rivet is tight (maintained with an occasional light tap with a hammer), and you use the thicker feeler leaves that won't bend easily in use, they do make a handy small sized bevel for taking angles.

Of course, if you just can't resist DIY, then a pair of rounded-end, narrow paddle-pop sticks, a carefully matched hole drilled through both (centred in the arc of the rounded ends), three washers (the 3rd to go between the wood surfaces), a short machine screw and a Nyloc nut will make a very effective small measuring bevel. Easy – think about it.

Every newsagent in the country probably sells school geometry sets, usually containing a plastic protractor, and a pair of plastic 90 degree triangles, typically with 60 and 45 degree hypotenuse angles. If you don't have one around the place – go buy a set. Look for the ones with the oversized protractor – they're simply more practical in the workshop for measuring angles taken off with a Bevel. If you hunt around, you can find metal protractors, in tool shops that service metal workers, with their measuring baseline along the straight metal edge – and that makes them easier to use with a bevel than the plastic ones, which usually have their measuring baseline set a couple of millimetres above the bottom edge of the plastic.

You will also need **Set Squares**. These are essential for marking ninety degree (right) angles. For marking lines for cuts, and for work on notches, laps etc these are essential tools. I have three good ones – small and medium sized carpentry squares, and a very large roof building square.

You don't necessarily need the latter a lot, but I find it incredibly useful at times and, on the few occasions where it has been absolutely essential for a particular job, it has absolutely paid for itself. It will be particularly useful when I'm setting up the steel beams preparatory to welding up the trailer for the dory. The trailer structure really has to be squared properly.

Holding Big Timber to Work It

One of my favourite bits of gear is a Triton 'Super Jaws'. It's able to hold big pieces of timber! It's also one of the tools I've learned to be wary of – ever since the one and only time I pressed the jaw release button with my shin directly ahead of the foot lever used to close the jaws on the work piece. Ouch! You'll only need to learn that lesson once, believe me.

However, once that lesson is learned and permanently etched on the brain, the 'Super Jaws' become invaluable, for anyone ever working with big pieces of timber, or metal. With its quite wide triangulated base, it provides a firm platform for your work and, once clamped, the work piece simply does not move. Working with timber, use some scrap to protect your piece from the jaws, because they really can be closed with a lot of pressure from the foot lever.

Some Important Safety Stuff

Working with plywood and epoxy resin has inherent risks. Dust from sawn or sanded plywood is at best a serious irritant for your breathing passages, and at worst toxic, as it contains particles of A-bond glue and you really don't want to inhale the stuff. Using power saws with plywood inevitably causes little splinters of laminate to rocket about – and you do not want them – or sawdust, or sanding dust – getting into your eyes. As for epoxy resin - the stuff is definitely toxic, and the dust from sanding it is a danger to your health.

Am I over-stating the risks? No. That means your tools list **MUST** include some safety essentials:

- A pair of properly sealing **Safety Goggles**, the type that volunteer bush firemen wear, that look a bit like skiing goggles – but with real impact resistant lenses and a sealing lip designed to keep smoke out. These will keep splashes, saw-flung splinters and bad dust out of your eyes. The good thing is that for those folk who wear spectacles, you can put these goggles on over your specs. *Don't settle for open-sided safety glasses or face shields – they're just not good enough for this type of work*, involving toxic dust.
- **Chemical-resistant gloves**. Some of the disposable housework gloves are okay for washing dishes, but resin and associated thinners and solvents like acetone quickly go through them and turn them into sticky goo. Go to a safety equipment store and buy the real thing – chemical resistant work gloves. Get the right size for your hand – floppy gloves that are too big are a bloody nuisance – and they're potentially dangerous in a workshop.
- **Barrier cream** – if you already have an accumulated sensitivity to epoxy resin, definitely put barrier cream on your skin, in addition to wearing gloves. If you don't want to develop an accumulated sensitivity use the cream.
- **Dust masks** – if you have to do any sanding back of epoxy over ply, wear a proper dust filtering face mask. Not the cheap disposable paper types with a basic nose clip. Invest in a proper rubber mask that seals around your nose and mouth, with replaceable filter modules, and which allows you to wear your safety goggles.

Electrics

Safety with Electricity in a workshop, and even more so on an outdoors work site, is really, really important. Here's a fundamental truth: 240 volt alternating electrical current kills people, every year. The trouble is we take it for granted, and people get careless. When was the last time you inspected the power sockets and extension cords and power boards in your home? In workplace safety terms, the law in most States and Territories requires that these things must be inspected regularly, and items like power cords must be tagged accordingly. So – that level of preventative care applies by law in the places where we work to make a living, but it's not necessary in our homes, where our kids are, or in our workshops? Hello?

Domestic indoor power cords and basic plug boards worry me in workshops. By paying just a little bit extra you can get heavy duty extension cords and power boards with inbuilt circuit breakers that just might save your life. The heavy duty cords have the same amp ratings as domestic cords, but they have a very much more robust casing, and more robust plugs. Inspect your cords and power boards regularly and if there's any sign of wear and tear, replace them. Your life is worth more than the price of a new extension cord, right?

When using power extension cords, also remember that you should unwind them fully. Using them partly coiled is potentially dangerous because coiled leads generate hot points. When removing a plug from a power socket, don't yank it out by the cord – because that strains the internal wire connections to the pins - hold the plug and remove it from the socket with a firm, straight pull. Basic stuff, yes, but it's important for your safety. Every new power tool comes with some kind of user instruction sheet or manual. Take the time to read this material properly, noting the electrical safety precautions.

In Praise of Daggy old Clothes

Last but not least, you should consider worksite clothing as part of your tool kit. In the context of building a ply and epoxy boat, getting epoxy on your clothing is absolutely inevitable. No matter how careful you are, you WILL get epoxy on your clothes and on any skin that's not covered with clothing. That's guaranteed.

Because I do a lot of DIY stuff, I rarely throw out old clothing. At my place, aged clothing either becomes workshop clothing, or cleaning rags – and both are essential. Mind you – old long-sleeved white business shirts (and indeed some not very old ones) actually make excellent sun-reflective, cool and comfortable fishing shirts, so not too many of them end up as workshop cleaning rags at my place. With a few sleeve rolls they also make excellent summer gardening shirts for women... so boat anglers really ought to hide them away from wives and girlfriends, as valuable and attractive assets.

Now here's an irony: the size and sort of business shirt you might wear if working in an office is about right for the workshop. Unless you have strange shirt sizing habits, these business shirts aren't loose fitting to the point of becoming dangerous around power tools, and not so tight as to restrain your arms and upper body from doing physical work – assuming you're smart enough to remove the necktie and keep the top button undone...!

What's comfortable for you in the office is likely to be right for you in the workshop. Long sleeved cotton and cotton/poly mix business shirts make darned good workshop shirts, when you're working with epoxy or paint. Raid your wardrobe – or your partner's wardrobe, take those that are nearing the end of useful life as a 'business shirt' (suggested by that hint of fraying at the collar), buy new ones if necessary for that purpose, and migrate the older ones into your workshop toolkit. Old trousers are similarly valuable, in particular for epoxy and paint work. Why spoil a perfectly functional pair of denim jeans with epoxy or paint spots and streaks, if you can put old work trousers to good use? If trousers are no longer slick enough for your social costume or the office, then it's time they migrated to the workshop.

In the cooler months, nothing beats a daggy old sweater for the workshop. Now I do not mean bulky knit woollen sweaters. No, they can't shed dust. I'm talking about inexpensive smooth surfaced sweaters. I have an old red one which is so grotty with glue, grease and paint marks that my wife won't let me wear it in the front yard, let alone beyond the yard! It has survived the wooden house build and many subsequent DIY projects, and I haven't had the heart to throw it out yet – not while it has some useful life left in it for the workshop. Using daggy old sweaters and social-life-expired rugby jumpers prevents other sweaters and tops becoming workshop tools...if you get the logic.

The key point is this – when planning a big DIY project, you're going to need workshop clothing that's comfortable and not loose fitting around power tools. It mustn't matter if the clothing cops epoxy or paint or grease on it. What's the point of doing a DIY project if you can't wipe your hands on your shirt? Going DIY is all about getting down and dirty!