

A roof over their heads



Photos by the author
The author's breeding set-up showing Dexion-style framework

Continuing the 'technical features' by Dr David Ford, the article this month covers the problems and solutions of building a Fish House

Every committed fishkeeper dreams of owning lots and lots of aquariums and many achieve this by filling the home with tanks. I remember as a child having no fewer than seven in my bedroom. You can imagine the family rows this caused.

The answer to this dream is a 'fish-house'. It is away from the family so you can make as much mess as you want... and just leave it too. It is also a haven, a little world of your own where you can pursue your hobby in peace and bubbling quiet.

It can equally be a big disappointment. If you build a fish-house that is difficult to run, that needs water humping down the garden, that causes electricity bills to soar, that drips condensation on to the electrical points, you will regret ever building it and probably turn it into a potting shed. It must be a place of pleasure, not another workload, so plan your fish-house from the beginning – don't just let it evolve.

Condensation

This is the big problem with the tropical or marine fish-house simply because it is full of 'hot' water. There are strict laws nowadays about no electrical sockets or even tumbler light switches in bathrooms because of condensation. A fish-house is far warmer and wetter than a bathroom and constantly too. Yet the average fish-house is festooned with sockets,

plugs and dangling wires, all carrying 240 volts.

Furthermore, the warmth and wet is ideal for rust to gallop away, eating into any metal frames or fittings, soaking into wooden boards, rotting the very fabric of a wooden shed. The cheap and popular chipboard will soak-up moisture like a sponge and swell, literally overnight, actually lifting

Safety first

No matter how well designed your fish-house; water and electricity do not mix so always include a power breaker. These are called RCDs (residual current detectors) or RCCB (residual current device/circuit breaker). They monitor the current in the live and neutral wires of each piece of aquarium electrical equipment, which

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and tilting even 50-gallon tanks.

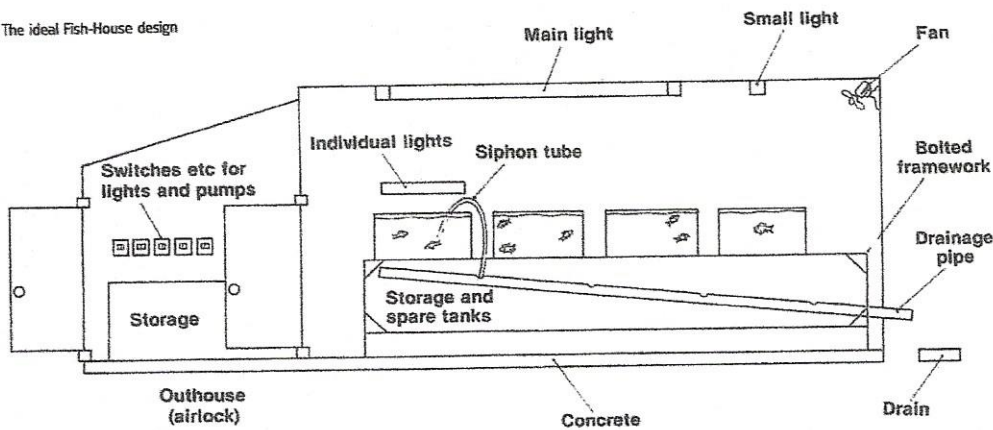
So beware of condensation. Design the fish-house to remove or resist this menace. Use cover-glasses (plastic ones are better) on every tank, so condensation drips back. Seal any chipboard with copious coats of Polyurethane varnish, or better still use Marine Ply. Make sure it is pure Polyurethane varnish, not so-called Yacht varnish because this may include anti-fouling agents that are toxic to aquarium fish.

Electrical sockets should be sited outside the main fish-house (see diagram) and only plastic covered wires run to heaters, pumps, lights. Where this is impossible, fit the weather-proof sockets and connections supplied to the pond-keepers.

should be the same. If this balance is disturbed – that is, when residual current is present in the wiring due to a fault or short – the RCD adaptor cuts the power very quickly (within 40 milliseconds), reducing the risk of electrocution. Make sure you do not use an RCCB called an ELCB (earth leakage circuit breaker) which shuts off the power supply if the earth wire becomes live. The reason is that most aquarium equipment is double insulated and does not include an earth lead.

It is usually recommended that you should fit the RCD to the main supply so any problem shuts down all the electricity (so have a good torch handy). This is actually good advice to the pond-keepers but not aquarium-keepers. If the system shuts down

The ideal Fish-House design



because of some minor electrical fault (and it will) whilst you are not there, the fish house could cool down and the fish will be stressed – or worse.

A better system is to fit a split distribution board (such as an MK Sentry system) and wire the aeration system, heating system, lighting and accessories such as a fan, separately, each with its own miniature circuit breaker. The 'fuse boxes' in modern houses all use this system where you just trip a switch to restore an individual circuit (after solving the problem – usually a failed bulb).

Keep it legal

If you are at all unsure about using these gadgets do employ a qualified electrician. Even if you are a competent DIY person you need to have a qualified electrician check and approve it. All electrical installation work in the home, garden, conservatory or outbuilding must meet current Building Regulations. Apart from some types of minor work, all electrical work must either be reported to the local-authority building-control, or be carried out by

an electrician who is registered with one of the Government-approved scheme providers (called 'Part P' of the regulations).

By law, all homeowners (and landlords) must be able to prove that all electrical installation work meets 'Part P', or they will be committing a criminal offence. So have it checked! An Electrical Installation Certificate ensures your safety as well as meeting legal requirements.

The ideal fish-house

The perfect fish-house will have a concrete floor with a built-in drain, so you do not have to worry about

observing the fish and this is not practical if the tanks are sited on the floor or on a top tier needing step ladders to reach them.

A proper brick-built unit with a slate roof and roof-light windows is the ideal, but rarely possible. Hence the garden shed is the common choice.

The wooden shed

This type of garden shed is adequate providing insulation is effective. Line the wooden sides with expanded polystyrene, using polystyrene ceiling tile adhesive. The polystyrene tiles themselves are ideal for under-tank

with sheets of plywood. This gives a good, attractive finish and fittings (such as hooks for nets or notes etc.) can be mounted on the plywood.

Dimensions

Choose a garden shed or lean-to that is oblong rather than square (see diagram) and make it at least six-feet/2m wide. This allows two rows of up to 18-inch/50cm wide tanks and a central gangway of three-feet/one-metre, the absolute minimum if you want to turn round in the place! Height depends on your own size, but you do not want to stoop. However, roof space is lost space and all the heat goes up there and is wasted. A sloping roof is the most commonly available design so this is best boxed-in and the dead space filled with attic insulation. This will also lower the headroom. A flat roof is easier to insulate (treat as a wall) and can incorporate a skylight.

The ideal benching is a non-rusting Dexion style that can be bolted into place but easily altered if a redesign is necessary. Cheaper, but effective, is 3"x2"/75mmx50mm softwood beams with chipboard benching. Mount via pre-drilling and using brass screws rather than nails; this makes changes possible. Apply polyurethane paint liberally.

The simplest way of installing tanks is to use traditional angle iron frame stands so each is an individual unit. Old furniture can be pressed into use, especially cupboards for valuable storage space too. The operative word here is 'old' i.e. with traditional wooden joints. Modern DIY furniture with chipboard and plastic joints will soon (if not immediately) collapse under fish-house conditions.

Next month

Don't miss... Lighting; heating; water and aeration in your fish house, plus other options of where to create your dream den. **FIN**

No matter how well designed your fish-house; water and electricity do not mix so always include a power breaker

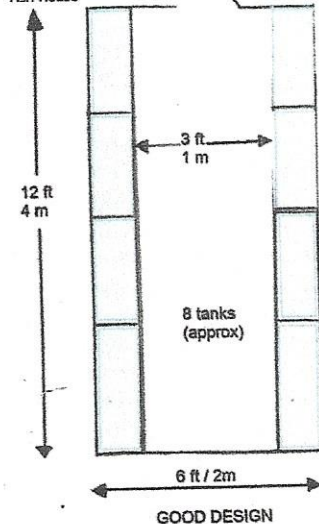
water spills. Plumbed-in mains water supply, with a brass tap for screw fittings that actually fit and don't leak or spray is ideal too. A sink – a big one – is such a luxury it is worth losing the space it takes up.

You have to have a work bench set at a height that allows you to work comfortably standing up (you can always use a bar stool). Tanks should be at working height too. The real pleasure of the fish-house

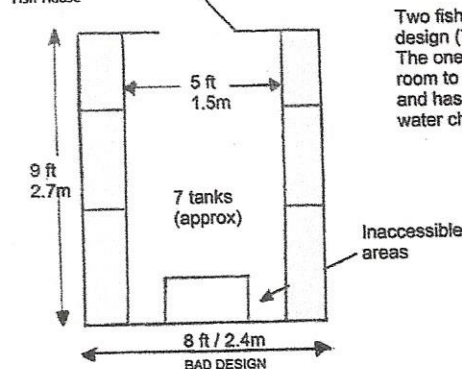
use, of course, and they help with temperature insulation too.

The side insulation will need lots of layered tiles or a single block at least one-inch/2.5cm or more thick. Ask at local Hi-Fi and TV shops for this material, often available free. Electrical wiring or airline tubing can be run along or through this material by cutting grooves with a knife (a hot one works well). Once everything is installed, the walls can be boxed-in

A good design for a Fish House



A poorly designed Fish House

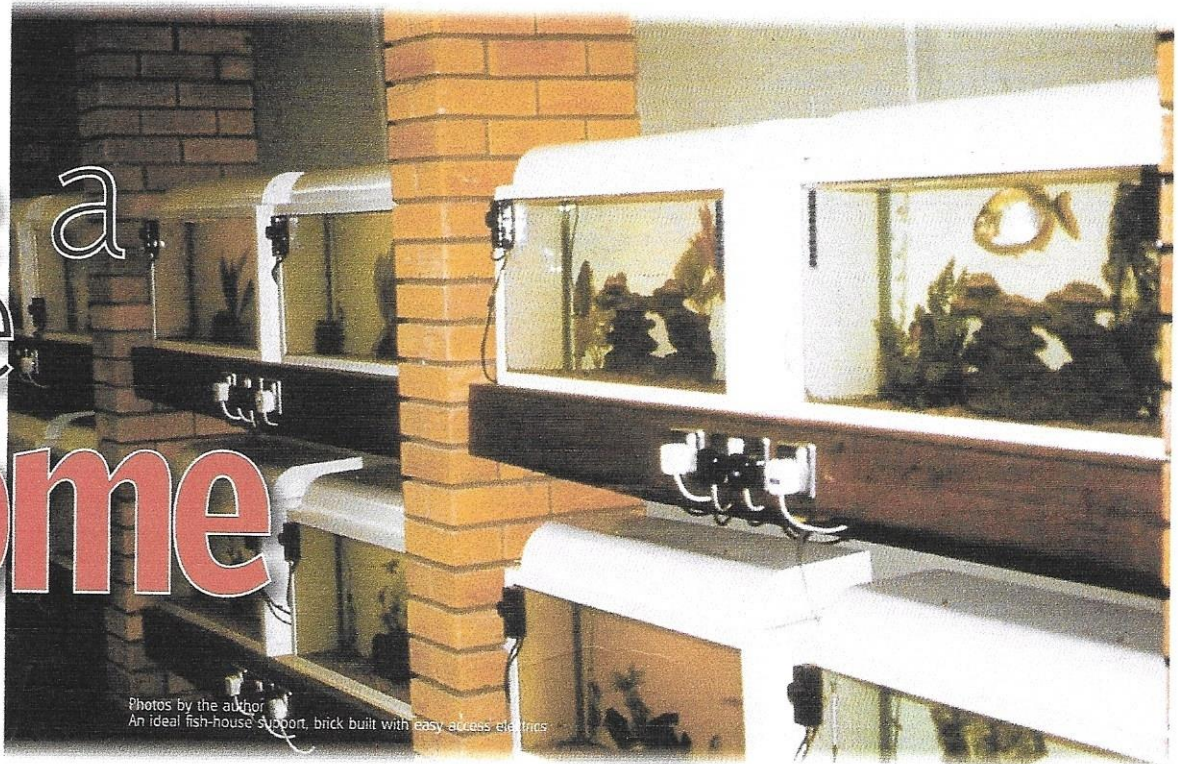


Two fish houses of identical design (72 sq ft / 6.7m sq). The one on the right devotes more room to the fishkeeper than the fish and has 'hard to get at' areas for water changes etc.

HAVE YOUR SAY

Log onto www.fish-keeper.co.uk and visit the forums section to make any comments, suggestions or ask any questions relating to this article

Make a house a home



Photos by the author
An ideal fish-house support, brick built with easy access electricals

Continuing on from last month's article of building your own fish house, we conclude with the finishing touches you need to make your fish house a home...

Lighting

Always use an overhead light. The traditional six foot by 12-ft (about two by four-metre) shed will take a 100-watt fluorescent tube in the roof and is cheaper to run than tungsten bulbs (being phased out anyway). However, a 25-watt tungsten bulb (or the energy saving equivalent which will probably be nine-watts) should be installed on a separate switched circuit. This is switched on first at night (or dark days) when entering the fish-house. Flooding the room with bright fluorescent light is a sure way to make gravid females give premature birth. Sensitive species will dash into the glass sides with 'flight' syndrome – super sensitive fish will have a heart attack.

The use of tank covers with integral lighting is an expensive luxury in the fish-house: glass or plastic covers are sufficient and individual fluorescent light tubes can be screwed on to the wooden walls or beams at the rear of each tank.

Many species prefer unlit tanks, especially if they are breeding stock. If you want to grow plants, or algae for feeding to fry, use a tank under a skylight. Nothing is as effective as natural light for such plant growth. Also, beams of morning sunlight can be the necessary trigger for spawning. The skylight should be double (in fact triple if possible) glazed or its cool surface will create condensation

problems. Pinning a clear plastic bag over the window is a simple way of double glazing.

Most garden sheds are supplied with a window but if an option, choose a shed without one – or box it in. It is lost space, a source of condensation problems and algae-growing light beams (at the wrong angle for spawning).

Heating

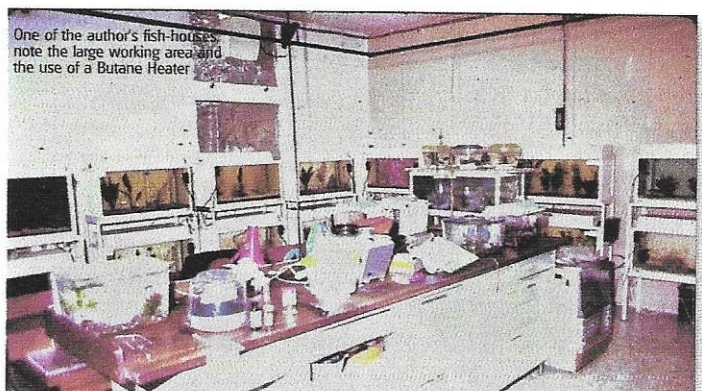
Back in the days of cheap oil my first fish-house used a paraffin stove. What a disaster... the tanks were always covered in a surface film of oil and the condensation was worse than anything that evaporated from the tanks. The smell was something else too. A change to a Butane

heater was better, but much more expensive because it had to be run continuously. It is a good standby heater in an emergency however.

The best system is electric heating, using a space heater with or without a fan, coupled to an air-thermostat supplied to gardeners for greenhouses. There is usually a 10°F/5°C difference between the air temperature and the aquarium water's lower temperature (if no water heater is used). Hence the fish-house should be run at 80 to 85°F (27 to 30°C) which makes it a very pleasant place to visit in the winter time.

Some tanks may need extra heating (e.g. Discus or hatching fry) so a traditional heater-thermostat can be included to boost the

Many a fish-house I have visited was buzzing with several airpumps, which is an irritating noise



One of the author's fish-houses note the large working area and the use of a Butane Heater

average temperature. In the summer months the fish-house can get very warm, especially if a skylight is used, but just propping open the door can control things and you save on electricity bills.

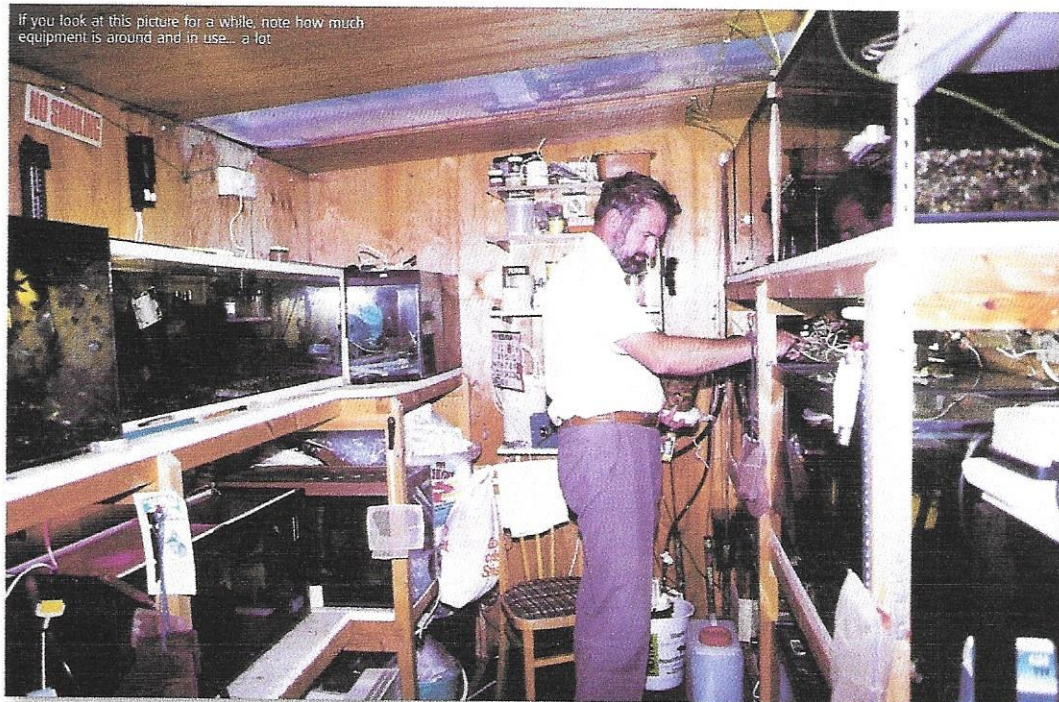
As heat rises, the hottest part of the fish-house will be the roof area (another reason for not siting tanks too high). A useful tip is to install a small fan in the roof to blow this hot air back down. Small cheap fans are made for the car industry that can run from a 12 volt transformer (model train set units are the cheapest) for safety and low cost.

Electricity is not cheap, but it is the lowest cost heating method providing that heat is not wasted. Insulation must be complete and well fitted before anything else is installed. Every nook and cranny must be blocked so that expensive heat does not escape. The only fresh air to enter should be via the airpump (which can be usefully sited outside).

Water

As stated, the ideal fish-house will have a water mains supply, but this is rarely possible. Don't lug heavy buckets of water about, use a hosepipe (plumbed in permanently) to bring water to the tanks. A water store is a good idea too. Lidded plastic bins (food quality best) can collect rainwater (from the roof when aged) or be used to modify the chemistry (e.g. peat to acidify or salts for marine water changes).

Water disposal is easiest down an internal drain, but again rarely possible. A simple alternative is to install plastic drainpipes (cheap ex DIY stores) at an angle so that gravity will do the work for you. Sections cut into the pipework can have a siphon



If you look at this picture for a while, note how much equipment is around and in use... a lot

The physics of saltwater solutions means that salt encrustation will actually creep along the tubes and wires that dip into the tank

tube inserted for individual tank water changes. The end of the drain pipe should be outside the unit over a soak-away (or collect for garden plant watering – fish excreta makes excellent fertiliser).

Plug the outlet or fit a cover over it, or cool air will flow in and warm air flow out.

Aeration

Many a fish-house I have visited was buzzing with several airpumps, which is an irritating noise. The bubbling of air stones, on the other hand, is very soothing. One solution is to site such pumps outside the main fish-house (in their own weather-proof box if completely outdoors; meeting the electrical regulations of course).

Another is to use an airblower to pressurise a garden hose slung from the ceiling, sealed onto itself in a circle. Individual airlines can be silicone-sealed into the hose and run to each individual tank, with its own clamp to adjust the flow.

The aeration will bring cool air if the pump, or pumps, is sited outside but the advantage of using fresh, oxygenated flow off-sets the need for the extra heating involved.

Opening the door will bring much more air inflow – usually much cooler and can create clouds

of condensation. An airlock is the answer to this problem. A simple lean-to will suffice and the extra space can house the pumps and electrical sockets etc. too. If this is not possible, at least drape plastic strips (as sold for kitchen doors to keep out flies or simply for decoration) inside the door entrance.

Other fish-houses

The traditional fish-house is used for keeping and breeding freshwater tropical fishes (the goldfish keepers have a much easier set-up) but a few hobbyists specialise in marines – or perhaps add a saltwater aquarium to their collection.

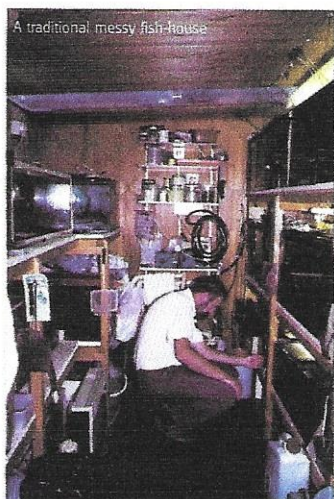
Since most hobby marines are tropical coralfishes, all the above comments apply, but there is the added problem of salt creep. The physics of saltwater solutions means that salt encrustation will actually creep along the tubes and wires that dip into the tank. Slowly but surely it will creep outside the aquarium and along the wires to the switches or connections and damage them or cause electrical faults. Salt creep along surfaces will damage worktops and actually promote condensation problems by soaking up moisture from the air.

To prevent this happening regular

checking and cleaning is needed. Also, fit salt-stops. These are plastic (for durability, cardboard will do for a while) discs with a central hole (and slit for mounting) so that they fit snugly around the electric cables or tubing. The salt creep will stop at this barrier.

Converted living space makes an ideal fish-house, such as the garage (park the car on the drive and pay the extra insurance!) or even a spare bedroom. The devoted room within the house is perfect for fishkeeping. The central heating can do the tropical heating (with a top-up via individual tank heater-stats) which keeps electricity bills down.

You can even plumb-in cold and hot water, even drainage, and safe electrical supply from the ring-main. Access does not need you to leave your home. All you do need is a very understanding spouse, partner, family.... **FIN**



A traditional messy fish-house

HAVE YOUR SAY

Log onto www.fish-keeper.co.uk and visit the forums section, to make any comments/suggestions or ask any questions relating to this article