Design your Dream Radio Shack

The following topics were raised by club members as they considered the most important points for a perfect amateur radio shack design. Many thanks to EARS members for their enthusiastic and practical recommendations.

Topic	Recommendation
Number of radios to be installed	This could be up to 5 in all, so allow space for expansion by utilising a shelved console. With so many cables converging on a cramped space, consider trunking the mains/DC supply and earth away from RF cables.
Mains power distribution	Use four or six way 13A distribution panels, each being wired back star-network style back to a common board. Avoid daisy-chaining the boards. Only transmitters are drawing relatively high current and only one will be used at a time, so total load is not as high as it might seem. Consider not even using 13A, but 12/24v distribution for RF equipment. Some members suggest that up to twenty 13A sockets are needed when all the ancillary equipment is fitted. Label each socket and cable end for quick identification and isolation.
Mains power cut-off	A large red button breaker available for about £24 is the best option. Otherwise a circuit breaker with clear signage adjacent to it. This must be easily accessible and visible to family members entering the shack.
DC power	A 25 or 30 amp 12V DC supply should be distributed to the radio equipment adjacent to the AC power. Banana plug sockets should be available in banks at regular intervals. Ideally the power supply should be a 110 amp-hour battery but a non-switched mode (linear) PSU can be used. Fusing is very important because 400A could flow across a short circuit if a large battery is used.
Co-axial cable entry to the shack	A Marley extension suitable for central heating flues was recommended. Alternatives are draught excluder where the cable was able to squeeze through the brushes/fibres to form a seal.
Earthing system	Most important is to not use domestic plumbing or C/H piping, which can seem to be the quickest and easiest . Always use a copper spike driven into the ground using a power drill set on hammer action. Use thick copper cable to attach the spike to a 2 metre long copper bus bar in the shack. Bond each earth of every item of equipment to the bus bar.
Broadband network connection (Ethernet)	To minimize interference, it is best to run a direct Ethernet cable from the house ADSL router. However, wi-fi will have to be used when the shack is some distance from the house. Consider using wifi-

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	cantennas for extra gain over long paths.
Computers	Do not use cheap power line transformers and hence avoid generating local interference. Some laptop screens can generate interference also. Laptop touch pads can be unpredictable in the presence of RF fields, resulting in spurious or no operation.
Lighting	This is a very personal choice as some members prefer bright white light and others prefer moody red or blue ambient lighting. Avoid florescent lighting as it generates interference and eye-strain from flicker. Beware of cheap low energy bulbs that have hopelessly designed circuits in their bases that produce widespread interference.
Heating	Central heating if possible. If outside the house, be especially aware of fumes from burning stoves and radiant heat onto equipment from electric fires.
Security	No members are using remote status monitoring of their shacks, but feel it would be beneficial. A very big lock is the best protection.
Fire safety	Extinguishers are present in a third of amateur's shacks. They should really be compulsory.
Seating	It is essential to have comfort especially for contesting. However extensive use of digimodes on computers mean that upright seating and correct arm, wrist and hand positions are important, to avoid repetitive strain injury.
Sound proofing	Bursts of squelch noise can be very annoying to nearby people. Consider applying sound insulation if this is going to bother your family. Most members felt it was important to keep sound in the shack, rather than worry about external sounds coming into it.
Refreshments	Assign a place for a kettle, drinks, supplies and a separate comfy chair and a pile of current ham magazines.
Component Store	Stackable bins are ideal for connectors, jack leads, short cables, portable meters, spare mics, keys and phones.
Test equipment	Not far from the console should be a some or all of the following: • digital multimeter • large analogue meter(such as an AVO) • RF power-meter • dummy loads • low pass and high pass filters (above and below 30 MHz) • frequency generator (up to 1GHz) • spectrum analyser • grid dip oscillator. A separate 12V DC PSU should also be present.
Log Book	Log book, call book and reference manuals all need space for use and storage.
QSL cards	Allow wall space for a QSL card display.
Ventilation	An extractor fan wired in parallel with the lighting is essential.

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Console rear access	This is indispensable particularly if kit is removed for mobile or portable operations frequently.
Insurance	Usually covered by the standard house and contents insurance. This is worth checking over especially if the shack is outside.
Cost	No limits!

Compiled by Nick 2E0NRJ on 28/09/2012