

MITREPLAN PROJECT PLANNER

Create a home theatre room



- An easy-to-follow guide to achieving a perfect result.
- Outlines all the tools you will need for the job.
- Includes a materials checklist.

PLEASE NOTE:

Before starting this project or buying any materials, it is worth your time to read all steps thoroughly first to be sure you understand what is required.

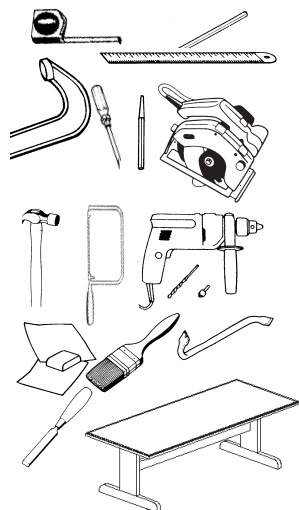
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MIGHTY HELPFUL™ MITRE 10

MIGHTY TOOLS FOR YOUR MITREPLAN



Measuring tape
Straight edge & clamps
Pencil
Circular saw
Cordless drill bits
Screwdrivers
Dowel boring jig and dowel "pops"
Claw hammer
Fine nail punch
Set of broadknives for setting plaster
Coping saw
Trestles
Pinch bar
32mm bevel-edged chisel
Sanding cork
Painting and staining equipment
Sacrificial straight timber for cutting on

✓ MIGHTY HELPFUL CHECKLIST

		ORDER
ACOUSTIC INSULATION		
Boral "Sound Stop" plasterboard (10mm or 13mm)		
Fletcher Insulation "SonoBatts"		
Plasterboard screws, paper tape, stud adhesive, total join finish, cornice cement		
String and staple-tacker		
STORAGE UNIT		
Timber		
1 / 2.4 x 1.2 x 32mm raw MDF		
1 / 2.4 x 1.2 x 18mm raw MDF		
Hardware		
1 small pack of 50 x 8mm fluted dowels		
1 small pack of steel-pin shelf rests (at least 10)		
1 small roll of iron-on vinyl edging (at least 4m)		
4 / 30mm hooded castors (spindle or plate mounted)		
Other Materials		
Wood stain (colour of choice)		
Clear polyurethane, or acrylic paint of choice		
PVA adhesive		
120, 240 grit sand paper		

Verbal quotes are indicative only. Written quotes on materials are available upon request from your Mitre 10 store.

✓ CUTTING LIST

PART	QTY	LGTH	WDTH	THICK	MATERIAL
Top	1	1400	445	32	MDF
Ends	2	483	445	32	MDF
Back	1	1136	430	18	MDF
Shelves	2	1132	400	18	MDF

(all measurements are in millimetres)

Get the full theatre experience in your own home.

Convert a suitable space into a home theatre with effective sound insulation. To get the full benefit from digital surround-sound media, games and equipment you need reasonable volume. This often includes substantial low-frequency (bass) noise that can be very annoying to other occupants or even neighbours.

This MitrePlan provides the information you need to effectively insulate for sound. You'll also find plans for a simple entertainment unit to provide an organised home for your theatre equipment.

You won't be able to completely prevent noise transmission to other rooms or the outdoors, but you can reduce it so that it's not annoying when mixed with the general background noise of the world around us.

It is worth noting that every time you reduce the level of sound by 10 dB you are halving the volume of the noise. So, if you can improve the isolation performance of a wall from Rw35 to Rw45 you will halve the noise volume, and really notice the difference.

Step 1: Select the room and get ready

The home theatre experience is different to simply watching TV in a lounge. Many lounge rooms don't have doors that can help isolate noise from the rest of the house. For this reason many people convert a garage, basement, family room or other separable space.

You may need to consult your local building authority, especially if you want to convert a garage, as these are generally not constructed as "habitable" rooms.

Be aware that these structures are not designed to exclude dampness – and dampness may damage your equipment and your health.

If your structure is masonry-walled you may only need to insulate the ceiling, however, many masonry walls can be improved with some additional wall linings as insulation against noise.

If your structure is framed in timber or steel prepare it for insulation. The purpose of insulation is to resist the movement of soundwaves through the wall, floor and ceiling cavities in the structure. There's really no shortcut – you must gain access to at least one side of each wall, ceiling and floor space, usually by removing the internal lining.

In the room you are converting to a home theatre, start by removing all of the architraves, picture rails, chair rails, skirtings and cornices. You may need to have your electrician make-safe any power outlets or switches that will be disturbed. Likewise have your plumber disconnect and terminate gas, water supply pipes or drain pipes that will be disturbed. Seal up the room to prevent the spread of dust by shutting the doors and/or taping plastic sheet over openings. Then "hack" down the plasterboard, fibrous plaster or panelling. There's really no nice way to do this – you can't save the sheeting for re-use. Be sure to wear a dust mask and eye protection because there will be old dust mixed with pesticides and vermin droppings (and maybe the odd dead beastie too). Clean up the cavities with a vacuum.

For more information about removing and installing architraves and skirtings refer to another MitrePlan: #84 "Renew your architraves and skirting boards".

Step 2: Insulation

Insulation batts may now be installed in the cavities of the walls, floor and ceiling. Sound insulating batts are different to those used for thermal insulation. Fletcher's SonoBatts and Noise Control Batts, for example, are ideal for fitting into walls, ceilings and upper floors. They're available in different thicknesses that help in improving the Rw (weighted sound reduction index) ratings. The higher the Rw rating, the more effective the system is at reducing noise transmission. You'll need full personal protection to safely handle insulation batts – dust mask, overalls, gloves, eye protection and a cap.

In ceilings the batts simply drop in between the ceiling joists, but in walls you may need to hold them upright either by stapling them direct to the studs, or by stapling string to the studs to form a "web" that keeps the batts upright and in shape.

Similarly for upper-floor installation, you can use string to hold the batts in position until the ceiling lining or furring channel is installed.

For best effect under floors, seal any gaps in the flooring from beneath. This can be tedious (especially for floor boards), but will

have a marked effect. Use a flexible sealant, such as No More Gaps, as flexibility is essential to allow movement without damage.

Pipework that travels near noise sources can conduct the noise to other parts of the building. Pipes may be encased in sound-insulating foam lagging and boxed-in with plasterboard stuffed with sound insulating batts.

But insulation is only part of the system. High performance acoustic plasterboard, such as Boral's SoundStop, should be installed for improved performance under the flooring, and prior to insulation batts.

For more information about insulation, especially for thermal performance, refer to another MitrePlan: #94 "Total insulation for your home".

Step 3: Wall and ceiling lining

Select a specially formulated noise insulating plasterboard sheet, such as 10mm or 13mm thick Boral SoundStop plasterboard. The thicker the sheeting, the better the insulating effect. When used with SonoBatts, SoundStop plasterboard will dramatically reduce the passage of airborne sound. Resilient Channel, mounted on rubber "resilient" mounts, may also be used to further isolate the wall linings from the frame. This simple addition has a marked effect on noise transmission by increasing the air-gap between wall linings and acoustically decoupling the wall lining from the frame members. This reduced contact provides a very small pathway for noise vibrations to transfer from the frame to the lining.

Fasten the sheeting using dollops of plasterboard adhesive on the studs, then screw-fix the sheet in position using common plasterboard screws. Tape the joints and "set" them with three coats of setting compound. Pay special attention to creating a solid bond because any looseness will allow the lining to vibrate against the framing – creating annoying noises. Fill all screw holes and once setting compound is dry, begin sanding back until all joins and holes are smooth to touch.

For more detailed information about lining see our other MitrePlan: #6 "Install or repair plasterboard".

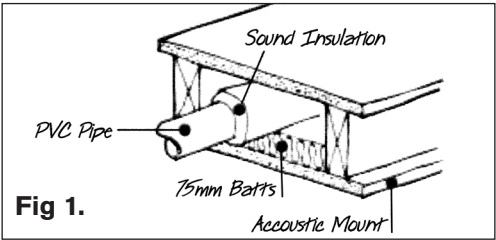
Step 4: Finishing off

Your room is ready to make noise, and you've done what you can to prevent noise "leaking" out into other spaces where it's not wanted, but you're not yet ready for the noise internally. Hard surfaces tend to reflect sound and soft surfaces tend to absorb it. Hold a shell up to one ear and a thick foam sponge to the other and the difference is dramatically clear. A space with hard, sound-reflective surfaces is acoustically "live". This is generally bad for your sound experience because each sound bounces around for a while and mixes up with the sound that follows, resulting in echoes and blurred noise.

You won't want the room to completely absorb sound either, as this can be an uncomfortable atmosphere. Carpet with a spongy underlay will take care of a large amount of sound reflection, as will large fabric-upholstered lounges or chairs. People's bodies will absorb a fair amount of sound. Avoid glass surfaces, such as tabletops, and cover windows with heavy drapes. Drapes are also vital for blocking light. In fact, drapes can be used to cover an entire wall, not just the window. You can also use large stretched-canvas, tapestry or other "soft" artworks on walls to absorb sound. If your room is still too live, try fixing some foam tiles to the ceiling. Have a close look at a cinema next time you're at the movies, and you'll get some ideas for reducing sound reflection.

The other clue you'll get from the cinema is colour. Except the bits you're supposed to see, everything is black. Black absorbs light, so you can minimise reflected light with this colour (or any very dark colour). Avoid glossy surfaces if possible. By minimising reflection you minimise distractions from the screen and the audience will then tend to be absorbed in the film experience.

Consider lighting very carefully, as some types (downlights in particular) create large escape routes for sound that are difficult to soundproof without creating a potential fire hazard. Consult your local Mitre 10 lighting staff for lights that are dimmable, low-heat, and able to be sealed-off. And only use a liscenced electrician for any electrical work.



Speaking of sealing-off, all this insulation aimed at preventing sound escaping can also stop air from entering. A lack of air, obviously, can be deadly but it will also make the audience drowsy – not ideal for enjoying home cinema. If the room has ducted air-conditioning it should ideally be on its own separate ducting, independent of other rooms. The duct may be wrapped in acoustic insulation to reduce noise pollution of other spaces. Encase it in plasterboard and insulation where it passes through quiet spaces (Fig. 1). If your room is to have natural ventilation, consider installing vents and ducts that draw and expel air from places that are unaffected by noise leakage. You can, for example use a ducted fan to draw warm stale air from the cinema room's ceiling and expel

it through a standpipe on the roof. Install vents in the floor or at floor level in the walls for a fresh air supply. For additional information refer to the Boral cinemazone website, www.boral.com.au/cinemazone and the Fletcher Insulations website, www.ecopink.com.au

Step 5: Build a storage unit

This simple unit is designed to accommodate large flat-screen televisions and your audio-visual equipment.

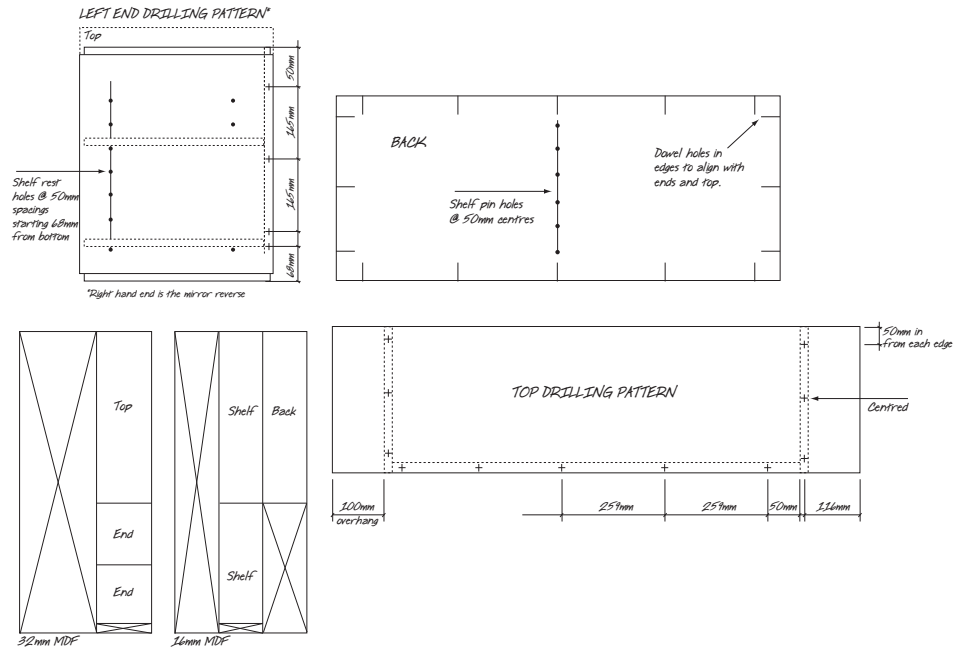
Before cutting MDF make sure it is done in a well ventilated area and always wear breathing mask, eye and ear protection. Cut all pieces accurately to size, or have them cut for you if a cutting service is available in your area. Use a hand plane or 80-grit sandpaper to smooth the edges of the parts that will be visible. Be careful to keep the edges flat and square.

Mark out the parts for drilling as shown, and then carefully drill the 8mm dowel and 5mm shelf rest holes. It's vital to be accurate and to hold the drill square to the surface. Fit "stops" to the drill bits made from scraps of timber. These ensure that you can't drill too deep or right through the material.

Use a router to make the "highlight" rebates. This is optional, but creates interest and can disguise any inaccuracy in your work. Iron-on edging is an easy way to finish the rebate, or you can use paint in a contrasting colour. We used grey vinyl iron-on edging, but a brushed aluminium laminate would look great.

Prepare all surfaces with 120, then 240 grit sand papers.

Stain or paint the parts with your choice of finish before assembly. We used black wood dye to stain the MDF, and then mixed some dye with the clear satin Estapol finish. After three coats the surface finish has a deep appearance that actually looks like stained wood veneer. When the parts are finished and dry, glue the dowels and parts together. You may need clamps or heavy objects to hold the joints tight together while the glue sets.



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MIGHTY HELPFUL HINTS TO MAKE THE JOB EASIER

■ While your architraves are removed, it's a good time to adjust that sticking or poorly fitted door. Reduce gaps, install sealing tape in the rebate of the doorframe (jamb) and install a weather seal at the bottom (Raven have a wide range of styles and colours).

■ Seal gaps in windows with an appropriate window seal. Standard (float) glass is a poor insulator, while laminated glass is somewhat better. Double (or even triple) glazing is a great sound (and thermal) insulator.

■ Heavy drapes over windows are great at blocking out light and reducing those unwanted echoes.

■ Avoid having electrical outlets within the same stud space on opposite sides of a wall. Mounting boxes, as used in masonry walls, can help reduce noise transmission through power points.

■ While the wall linings are off, run speaker cabling, projector cables and any other concealed services. Think ahead for anything you may want in future and install the cables, ducts and surface plates now.

■ Protect your eyes and ears when you use power tools. Protect your helpers too.

■ Some Mitre 10 stores can refer you to trustworthy local tradespeople.



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WARNING: There may be by laws or regulations of councils or other statutory bodies that you must comply with when following this MitrePlan Project Planner.

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