

Every electric guitar needs shielding to keep unwanted electrical noise (buzz, not hum) from getting into the wiring and controls. But be aware that many players choose not to install shielding because most unwanted noise is kept at bay by virtue of the fact that they themselves act as a human shield when in contact with the (grounded) strings. Letting go of the strings removes the shielding effect and noise will enter the wiring. NOTE this doesn't happen often because most players turn the volume control down to prevent handling noise or risk having the strings break into feedback so noise is not a problem. If you are one of the majority of players who practice this then you may not benefit much from shielding. But if in your style of playing you cease to have contact with the strings or bridge while the strings are sounding then shielding will be a benefit. There are basically two types of shielding available. Adhesive backed copper (or aluminium foil) and conductive paint.

Conductive paint for guitars without vintage value.

If you don't feel confident in this method go to the next section on Shielding for Vintage. I like conductive paint for newer guitars but there is often a problem in getting it to adhere to painted surfaces. I get round this by scraping the paint off the cavity surfaces by using a router with a dulled 1/2" bit (12mm). Since it's not sharp it will only remove a very thin layer of wood. The exposed wood is an excellent surface for the conductive paint to stick to. Test the paint on a painted section of cavity floor to see if it sticks satisfactorily before getting into this too deeply.

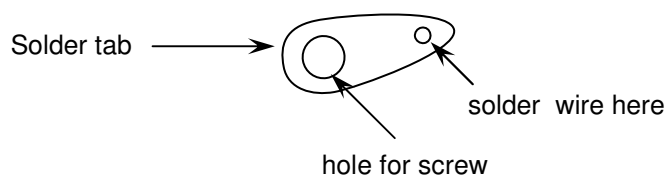
I also undercut the wall of the output socket cavity to prevent shorting of the socket terminals to the conductive coating, like in the diagram on page 3. Using a special T cutter, that has the corners rounded or chamfered off, undercut (by 2mm) the output socket cavity by letting the shaft of the cutter rub on the cavity wall. The objective is to provide just enough clearance for the terminals so it's not necessary to rout full cavity depth and it's only necessary to rout part way round the wall (from where the terminals poke out to the tip end and back, like shown).

Then I link both the main control cavity and output socket cavity together by coating the drilled connecting hole with conductive paint (using a shaggy artists brush). After the paint has dried thoroughly for some hours test for continuity between the cavities with a multi-meter set to Resistance x 100. You should have no more than about 500 ohms between the output socket cavity and the neck pickup cavity for an effective shielding job and with really good paint you will get as little as 10 ohms. If you don't achieve this then re-coat anywhere that looks thin or streaky. You can purchase conductive paint from Allparts or Stewart McDonald.

WARNING: Conductive paint contains solvents that will dissolve lacquer finishes of older guitars. It is good practice to test for this on a covered portion of the painted surface with a little denatured alcohol (100%) on the tip of a finger. If the finish goes sticky then it's lacquer so be careful not to spill or drop any paint onto the guitar. If you do drop some paint onto the guitar wipe it immediately with your finger or a cloth. The smeared surface can be fixed later by cutting and polishing. Leaving it there to dry will result in an unsightly swelling of the finish that you may never remove.

Spilled paint on a modern polyester finish can be removed with solvent without any harm. Just don't rub too hard as it will scratch the finish.

The conductive paint must be grounded with a wire to any suitable ground point e.g the back of the volume pot cover. The wire may be soldered to a solder Tab which is then fastened to a cavity wall in direct contact with the shielding paint with a suitable self tapping screw. Failure to effectively ground the conductive paint will cause more noise than if there was no conductive paint installed.



Copper foil for older guitars with Vintage value:

For Guitars with vintage value there is only one choice and that's adhesive backed Copper foil (available from Allparts Part #EP 4991 Copper Shielding Tape 12" x 12" - see links page).

This does not change the guitar in any permanent way and therefore the guitar will retain it's originality should the foil be removed. Aluminium foil is not suitable since it is very difficult to solder.

First clean the surfaces to be stuck to with a clean cloth damp with solvent such as White Spirit, Mineral turps or other non-aggressive type solvent that won't fine harm nitro-cellulose finishes. Then cut the foil to fit neatly onto the floor of the various cavities and stick in place. Next cut some foil into strips .6" (15mm) wide for the sides of the cavities.

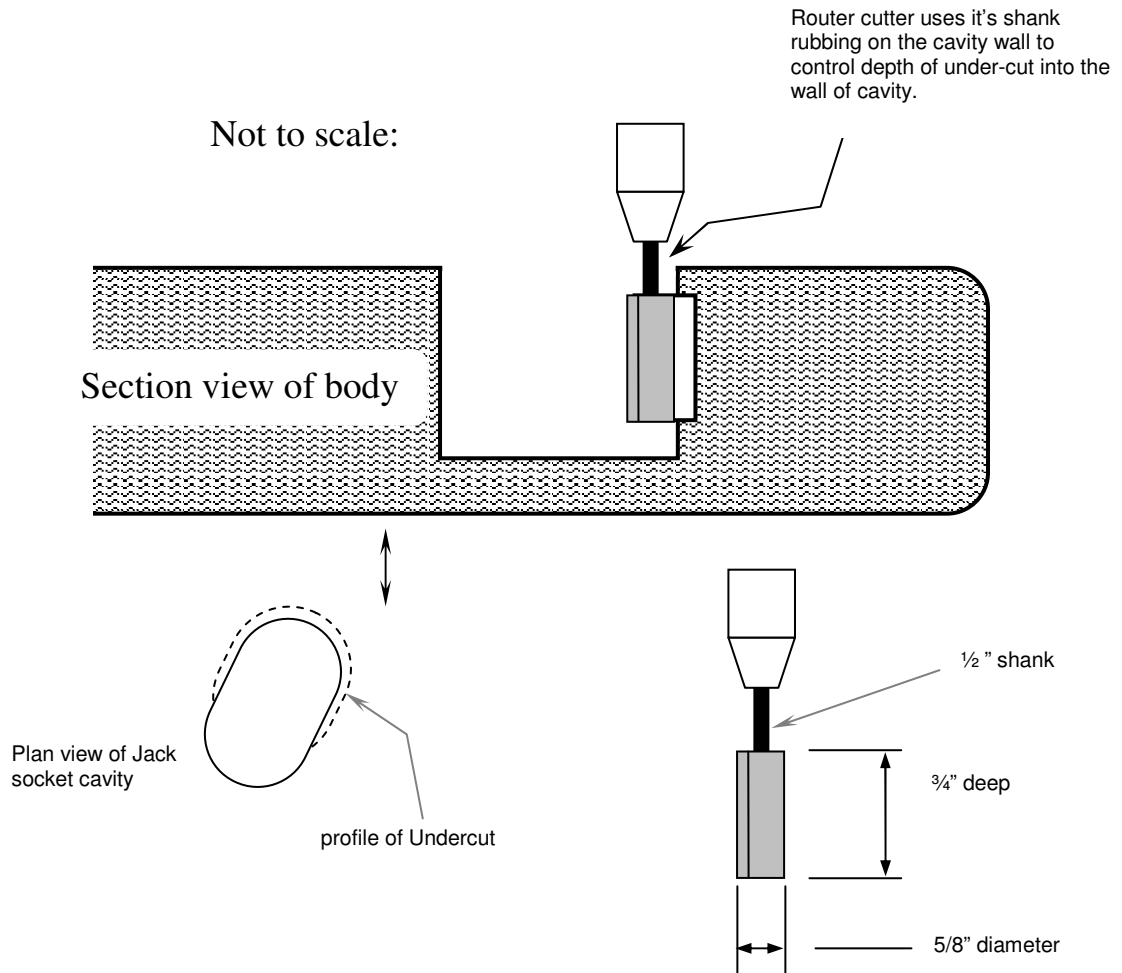
Next; solder the floor piece and side pieces together with a small blob of solder at intervals of 1 or 2 " (25 - 50mm), just enough to stop it coming adrift should the adhesive backing fail. To prevent accidental shorting of the output socket terminals to the shielding cover the wall of the cavity with some kind of sticky tape. Ordinary household tape will do. Same applies to the wall adjacent to the selector switch terminals.

Connect the output socket and main control cavity shielding with a tube of copper foil fashioned by forming it around a drinking straw (or similar object). Insert this tube into the connecting tunnel. Splay the ends out and solder each end to the shielding in both cavities.

Ground the completed shielding with a wire soldered to the copper and connected to the back of the volume pot (central ground point).

Most pickguards require shielding only as a cap over the main control cavity. This can be of adhesive backed Aluminium foil as it doesn't have to be soldered. It is grounded by virtue of pressure contact with the controls. When completed check for continuity with a multimeter between all the various sections of copper foil fitted to the body cavities. You will get a ZERO ohms reading if all is in order.

Undercutting the jack socket cavity of a Stratocaster



IMPORTANT: After making the cut **STOP** the machine to a complete rest before withdrawing the cutter from the guitar. Reason is if a spinning cutter is lifted out and is not positioned within the footprint of the cavity hole an piece of wood will be undesirably removed. The desired undercut should not be seen from the outside.