

Stereo equipment & mains wiring

A line of reasoning which I have held for some time is to isolate mains transformers from metal chassis so that the earth wire can be connected to the transformer casing. This would eliminate the earth connection to metal chassis, the main cause of earth loop hum in hi-fi equipment, tuners, PA amplifiers, mixers, etc.

In fact, with mains transformers isolated from metal chassis, one could even argue for the adoption of two-wire mains connection. Modern mains transformers are generally of high grade insulation construction which, together with isolation from the chassis, effectively provides "double insulation" and in turn could even eliminate the need for an earth wire. However, in the interests of the highest possible electrical safety a three-core flex could be used as described earlier without causing any earth loop hum problems.

Modern turntables isolate the pick-up (or cartridge) from the metal frame which allows the frame to be earthed without introducing an earth loop from this program source.

Tape recorders and cassette decks are

another problem because motors would require some form of double insulation construction. These units appear to be the only units not capable of being readily adapted to the "double insulation" principle. Some basic redesign of motor mounts, metal drive pulleys and switches would be necessary for these units to attain "double insulation" construction.

I understand some off-on mains switches are virtually double insulated (some pushbutton types), so even these items don't complicate the issue if a manufacturer or hobbyist must incorporate an off-on mains switch on equipment.

Other simple inexpensive aspects of "double insulated" mains transformer and mains cord installation to achieve highest levels of safety might include;

(1) Primary and secondary windings of mains transformers on divided spools rather than layer windings.

(2) Firm and secure mains terminals provided on transformers to eliminate need for flimsy tag strip connectors,

(3) Effective mains cord grommets and securing clips for mains wire entry.

(4) Fuses in the secondary circuit or some other means to isolate gross electrical overload conditions occurring in

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the mains transformer. This is a precaution should primary to secondary breakdown occur in the mains transformer which could in turn allow the mains voltage to be injected into the chassis.

I have never seen the use of "double insulate" mains transformers mentioned in your magazine as a means of eliminating earth loops. Without question many people are forced to disconnect the mains cord earth wire from metal chassis in order to use their hifi equipment and the like. With these poor principles forced upon many people in the electronic reproduction area why not work towards the elimination of mains cord earth wire to chassis connection especially when, in my view, effective safety can be accomplished at relatively low cost.

I feel it is much safer to promote the approach described here rather than turn a blind eye to the present wide spread practice of disconnecting the earth wire in order to eliminate the annoying earth loop hum problem.

Bruce Hunt,

Heathmont, Vic.