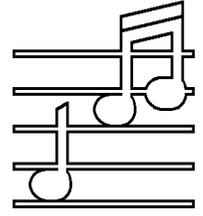


AUDIO BASICS



A MONTHLY NEWSLETTER OF AUDIO INFORMATION
VOLUME TWELVE NUMBER ONE JANUARY, 1993

Well! You've buried us in orders - so - you've got 2 more weeks!

We really appreciate your response to our one time special 20% off sale on new factory wired AVA components. You have made January the best sales month we have ever had. Even more we appreciate the feedback those who have been receiving the new equipment have been giving us. One gentleman wrote to tell us that after a month his pet dogs have finally stopped running into the sound room each time a new voice appeared in the system. They were finally starting to learn that it was the high fidelity system, not new live visitors! We are glad you are so happy with our new designs. You have been telling others too.

So we are getting calls from those who read about the sale but didn't quite believe it until they heard from a friend that has received our equipment. You are asking if you can still have a bit more time to get an order in. Or, you have purchased one piece and now want another. Is it now too late to take advantage of the special prices? No, it is not too late! We will give all of you another two weeks to get that order postmarked. Get it in the mail before February 21st and we will still honor the special prices.

But, you have to give us a bit more time too. Our normal lead time in house to fill your order is three weeks. But to say that this special event has made our work load a bit heavier is an understatement! You must allow us four to six weeks to fill all these orders. Each piece is still custom built, not mass produced, and we don't want to cut corners or quality. Give us time to do it right and we will provide you with long term durable and musical equipment of extraordinary value. Thanks for your support and your patience.

The Return of The AVA ST-70 Power Transformer!

Your renewed and growing interest in our Super 70i rebuild has convinced us to commission a re-order for our custom designed power transformer (improved). We will have brand new Super 70i power transformers in stock soon after you read this. We have specified a two step vacuum fill potting process and more flexible leads to make our transformer quieter and easier to install. Our power transformer eliminates the 5AR4 rectifier tube and its 100 watts of waste heat, improves supply regulation, and enhances

long term servicability of your amplifier. Our transformer is designed for a solid state diode bridge (included with the transformer at no extra charge) and allows safe operation with no turn-on thumps or overvoltage. It works with both the AVA Super 70i and the original Dyna St-70. Now that rectifier tubes are priced at \$25 or more, our new power transformer and solid state supply makes more sense than ever. We supply it with dual primary taps so it can be wired for 240V operation too. The price is \$100 plus \$15 shipping in the continental USA. You may place your order with us now.

Exorcising Gremlins from the System

O.K., now that you have got all that nice new equipment, let's make sure that it is connected and working properly. It is time to review some of the common "it doesn't" laments we hear about and inform you of easy ways to get rid of problems or to make sure they don't occur in the first place.

"I connected my video system to my audio system and now I have lots of hum!" This is almost always an easy gremlin to vanquish. The chances are you have a dirty ground on you cable system antenna cable. No, you cannot polish it clean with Cramolin – it is dirty electrically, not mechanically (although Cramolin will help a whole bunch if you are getting fuzzy or intermittent video - you may have dirty mechanical connections too).

What we mean by a dirty ground is that the ground side (outer shield) of the cable is supposed to be at ground potential, but because of long runs of cable and old and oxidized connections, the chances are it really is not well grounded. This dirty ground gets transferred to the chassis on your VCR when the Cable TV coax antenna is connected directly to a screw-in or push-on chassis mounted F-connector. Then the gremlin sneaks over to your high fidelity components on the ground side of the audio interconnect cables when they are attached from the VCR or TV to your preamplifier. This gremlin really is not being mean, it really is a happy little fellow that likes to sing along with the music. Unfortunately, it does not know the words – so – it hums.

The cure is to not attach the dirty ground in the first place. There is an easy way to not do this. You need to couple the signal from the Cable TV antenna to your system without providing a DC connection for the hum gremlin. You do this by making the connection from the coax cable to the VCR with two 75 ohm to 300 ohm matching transformers connected back to back. You connect the coax cable to the 75 ohm end of one 75 ohm matching transformer, connect the 300 ohm end to the 300 ohm end of a second matching transformer, and then connect the 75 ohm end of the second transformer to the F-connector on your VCR or TV. This provides a transformer coupled connection for the RF signal, but isolates the cable ground from your equipment. If you

have an older TV or VCR and are already using a 300 ohm matching transformer on your coax cable end the ground is already isolated.

A second cause for hum when connecting an antenna system to your audio equipment (at either your FM tuner or TV) is too many grounds at different potentials causing ground loops and hum. The most likely culprit is a 3-prong AC plug on a power amplifier. The old Dyna 400 power cord is a good example of a bad example. This arrangement connects the amplifier chassis to the AC wiring ground. The tuner chassis is also attached to ground thru the antenna system. Unfortunately these two grounds are likely to not be at exactly the same potential due to the electrical resistance of the wires and connections between them. This will cause a ground loop hum. The cure is to use a "cheater plug" (3 prong to 2 prong) on the power amplifier's AC cord end which eliminates that chassis ground connection - or to use a matching transformer on the cable antenna at the tuner to eliminate that DC ground connection. Caution! Do not use a cheater plug unless you know that the equipment does use a chassis isolated power transformer. Some video components do not use power transformers. They simply rectify the AC 60 Hz to provide internal DC. This makes their chassis part of the circuit. They have polarized power plugs to insure that the ground side of the internal circuit is always connected to the ground side of your power line. If the power plug to a transformerless component is reversed, then the chassis may have exposed 120V AC and touching it (or any component connected to it) and ground at the same time could electrocute you! (This, by the way, is why you don't dig into the insides of your TV set to bring wires out to a better loudspeaker. You risk frying yourself as the internal speaker connections on a TV set likely carry lethal voltages).

Caution! Hum from a bad ground on a cable system or house antenna system may need professional attention. It is possible that the cable system is really screwed up and that dangerous voltage is present. It is a good idea to contact the service provider and ask them to make measurements to insure that your antenna cables are not sources of danger and to see that they fix it if there is a problem.

Finally, there may be other external sources for hum such as an electric water bed heater or high

intensity lamp on the same circuit, nearby fluorescent lamps, or even a location too close to a radio or TV broadcast station or radar installation. If all else fails, move.

“One channel of my system has quit working! There is no sound at all - or only a faint sound if I turn the volume way up.” Assuming no smoke, no blown fuses, no speaker wires kicked out, and no wild parties the night before, you likely have a channel dropout due to an oxidized switch contact. If there is no hum, no heavy distortion, nothing is getting hot, and you have not just finished making a change to the system, then a switch dropout is your most likely problem and usually this can be fixed without need for outside service.

In an atmosphere containing free oxygen such as ours, metals slowly combine with the free oxygen to form metal oxides. Metal oxides generally don't conduct electricity.

Switch contacts are made of metal. Your high fidelity system is chuck full of switch contacts. They exist in the selector switch, in the tape monitor switches, in the mono-stereo switches, in the EPL switches, in speaker selector switches, and more. *These contacts are designed to be self-cleaning if they are used.* In general the switch action provides a sliding, wiping action as the contacts open and close, cleaning off any light layer of metal oxide and/or dirt and film that may have accumulated. But, if switch contacts go unused for a substantial length of time, the oxide and dirt layer may build up thick and tough enough that the switch will lose continuity and a channel will drop out because the signal could not pass the oxidized contact. The problem is most likely to occur as the equipment ages and if certain switches are not used at all for a long period of time. A humid environment, especially near an ocean coast, hastens the efforts of the switch oxidation gremlin.

The old adage “use them or lose them” certainly applies to all of the switch contacts in your high fidelity system. The best way to keep the switch drop-out gremlin away is to exercise your switch contacts (then you won't have to exorcise the gremlin). With the system off, push every button and rotate every switch and control several times each week. Use the switches. Let their self-cleaning wiping action work to get rid of oxidation buildup before it gets too thick or tough for the

switches to remove by themselves. One exception – leave the AC power switches out of the exercise cycle. Don't cycle the equipment on and off needlessly. This can damage power switches and stress some electronic circuits. But don't leave them on all the time either. This can cause minor problems that occur when you are absent to turn into major problems. Use common sense – simply treat the high fidelity system as you would any high quality appliance – turn it on when you want to use it and off when you are done.

A contact dropout is most likely to occur when you operate a switch that you have not used for many months. Saying, “I wonder what this is for,” and pushing in an EPL button you have never used before may very well generate a phone call to the repair service. Sometimes cycling the switch 15 - 20 times will finally break through the oxidation layer you just disturbed and the switch will start working again. Sometimes more help is necessary.

The best help we know of is a can of Cramolin Red spray contact cleaner. This cleaner (made by Caig Labs of San Diego, California) actually dissolves the metal oxides on switches, jacks, and controls and almost always banishes the dropout gremlin. Cramolin Red is the only contact cleaner we have encountered in recent years that really works and is not harmful to the switches or its mechanical structure. We have it available at \$18 per 6 oz. spray can plus \$4 shipping in the continental USA.

The trick is getting the cleaner into the contacts. With open slide side switches and rotary controls it is easy. With push-button switches it is a bit more tricky. On Dyna Pat-5 based units, one can access the push-button switch contacts from the inside. The cover must be removed, the unit stood on its nose so the buttons point down. Then bend the end of the Cramolin spray tube at right angles so it can point down directly into the back end of each switch position. Spray into each switch, cycle each several times, and with any luck at all it will work as good as new and (if you exercise the switches from thereon) stay dropout free for years. With Hafler DH-110 units, getting contact cleaner into the push-button switches is more of a pain. The Hafler switches have not aged well and are dropout prone. The brand of switch used does not have any obvious openings. So we

use a jeweler's screwdriver and gently pry up a back corner of the switch cover a little bit (too much breaks it!) so that a blast from the Cramolin can will actually get into the switch.

So when you get a channel dropout or noisy control because of an oxidized switch contact, exercise the switch and blast it with Cramolin to exorcize the gremlin and your system will be as good as new.

There is another cause of control noise and switch contact pops and snaps that exercise and Cramolin won't cure. The noise can be caused by DC voltage on the control. In a properly designed and working component, there should be no DC potential across controls or switches because then breaking or making contacts will cause a signal transient to occur (a pop or thump from annoying to system damaging) and will cause lots of static and noise when controls are rotated. If a coupling capacitor starts leaking, or if a DC coupled circuit drifts out of balance, this may inappropriately put DC into your control switching network causing switch and control noise you cannot get rid of. If cleaning the controls doesn't help, the problem may be the circuit, not the switches. Then your component will need to see a repair shop.

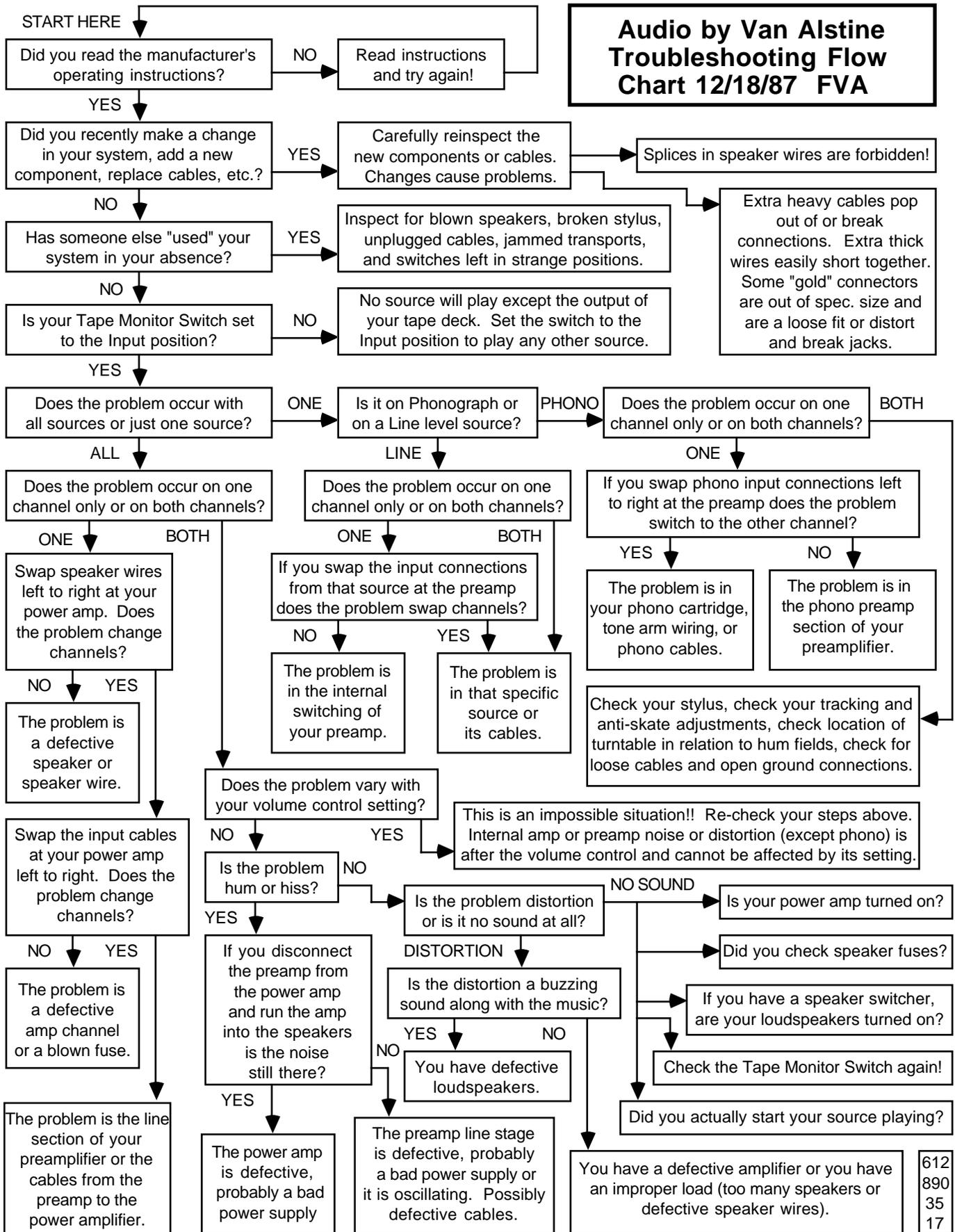
"I just hooked up a new component and now it doesn't ..." The old hookup error (cable impaired) gremlin has struck again. The most likely problems are:

- Getting it backwards when connecting a tape deck. It is supposed to be "In to Out" and "Out to In" not "In to In" and "Out to Out." If you mix it up, the only component that will play will be the tape recorder, and it will play no matter where the selector switch is set. Check the cables, you have got them bass- ackwards.
- Installing the new amp (or preamp) and now the volume control doesn't work at all and everything plays real loud! You hooked the amplifier up to the tape outputs on the preamp instead of to the audio outputs. The tape outputs are ahead of the volume control and are not affected by the volume setting. Shut the system off and move the cables.
- Connecting a CD Player to the Phono Inputs. This will cause terrible distortion when you switch to phono and probably cause a bleed-thru of tinny sounding CD sound into every-

thing else. The CD Player is a line level source and must be connected to a line level input such as Spare, CD, or Aux. Check your owner's manual. Phono Inputs are for a record player only. They have extra circuits which greatly boost the output of the phono cartridge and re-shape its frequency response. These circuits are overloaded by a CD player causing this distortion.

- Using the Digital Outputs on your CD player to connect it to the inputs on your preamplifier. This does not work either - you will get no sound at all. If your CD player had digital outputs, they are for connecting the unit to an external D to A converter (generally a very expensive waste of money and effort - a good D to A converter chip is about the size of your thumbnail and costs about \$20). The only real value of Digital Outputs on a CD player would be if there were high quality digital recorders for home use that would directly accept and record the digital output of the CD player, allowing you to make recorded clones of your CDs. There are not any machines that will allow this, at best serial copy code protection is added, and most have bitstream converters themselves, so the copy is bastardized in the playback process in any event.
- Installing a new headphone junction box or loudspeaker switch box or speaker wires and now you blow fuses in the amplifier. Many accessories have a common ground connection (the left channel and right channel ground wires are tied together inside the switch box). If you accidentally reverse the polarity of your speaker wires in making the connection to the junction box, you actually short one channel to ground, or worse, tie the hots of both channels together. This can destroy both channels of your power amplifier! Always use color coded polarized speaker wires and never lose track of which conductor is hot and which is ground. Avoid multi-strand braided speaker wires. Not only do they exchange the wire's series inductance with possibly de-stabilizing additional capacitance, but they are easier to misuse and short out. If any two strands of the many that are there short together, then you are shorting the outputs of your amplifier. If the amplifier is not well built and defended, you may damage it. If the speaker wire is too thick (most extra cost wires are) then you will

**Audio by Van Alstine
Troubleshooting Flow
Chart 12/18/87 FVA**



have trouble making a reliable connection to speaker and amplifier terminals. Fuzz-ball connections and shorted together oversized lugs do sound different, but they don't sound better.

Push-button Challenged. (Turn off the tape monitor button!!!). We still get more preamps returned because "they are dead" when the only problem was that the tape monitor button was set to the tape position (so that only the output of a tape recorder will play back) instead of to the input position (so everything else will play normally) than for any other reason. Forgetting to turn on a loudspeaker control (on integrated amplifiers and on Pat-5 with the speaker switcher in use) runs a close second. We won't even mention that the headphone jack on the Pat-5 chassis won't work at all unless you wire the connections to it on the back. Instruction manuals are good for more than just blocking the heat vents in the cover.

Finally you won't get rid of the gremlin unless you get the correct component fixed! That is the reason for the troubleshooting flow chart printed herein and supplied with every unit we sell. No - it isn't just decorative packing material. It will help you unambiguously find where the problem is, usually fix it if it is one of those discussed above, or at worst case get us the right thing to fix. The worst example of this of course, was the Mos-Fet 120 with the "terrible intermittent beeping sound." The client finally shipped it back and then, after it got here, called to complain that our amp was so bad it had permanently ruined his entire system - the terrible intermittent beeping sound was still coming from his system, even after the amp was removed and was at our shop! That is what I call a real persistent gremlin - Steven King should be so lucky! *The "problem" turned out to be a low battery in his smoke detector* - not coming from the audio system at all - but he never did fully trust us again.

If you actually save and use our troubleshooting chart then you won't blame us for your smoke detector gremlin. Let's follow thru one example on it to get you more familiar with it.

Let's assume you just installed (between your power amp and your preamp) new gonzo cables - the ones with the one carrot gold looking plastic fittings - fresh from amazing discoveries at only \$700 per foot. Let's assume underneath all that

fat plastic and pot metal the one strand crimped hot connection broke on the right channel cable at the preamp output jack. Now "it doesn't work!" What to do?

Go to START HERE. Read the first box. If your answer to the question is "Yes" then go to the box the "Yes" arrow points to. Read that box. A "Yes" answer here immediately directs you to inspect those new cables. Or, follow the questions and answers down to the box that asks "Swap speaker wires left to right ..." In your case making this change will cause the problem to change channels (think about why). A "Yes" answer here directs you right on down to the correct diagnosis of either the interconnect cable or the preamp line stage. Swapping the interconnect cable from channel to channel will further isolate the problem. You will simply get a new set of interconnect cables rather than sending us the amp and/or preamp for an impossible warranty repair (we cannot fix what is not broken). You will be happier, we will be happier, and the post office elephant (the one with the "fragile" stamps glued to the bottom of its feet) will not have had a shot at your equipment. What could be better!

USED EQUIPMENT

Super Pas Three preamplifier complete with our black AVA faceplate and knob set, our precision volume and balance controls, our ground plane jack set (not gold plated but still very durable and useful), the selector switch wired to provide 5 line level inputs plus phono, the externally mounted power transformer, good Chinese 12AX7A tubes, and all our latest circuit updates. This unit is absolutely current and perfect mechanically and electronically. It is an older chassis, with our circuit parts installed by the owner on the original Dyna boards with our power supply board added later. The workmanship is excellent, the final upgrades were installed right here, and the cosmetics are good with only a few small dings in the black cover. It is yours for \$275 plus \$10 shipping in the continental USA with a six month parts and labor warranty.

Call us in a couple of weeks, there should be more used equipment coming, but not here to talk about yet.

Frank and Darlene Van Alstine