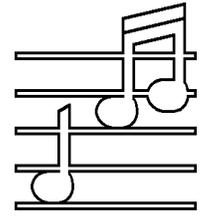


AUDIO BASICS



A MONTHLY NEWSLETTER OF AUDIO INFORMATION
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Never Use USA 240 AC With Your Audio System! You Risk Electrocution!

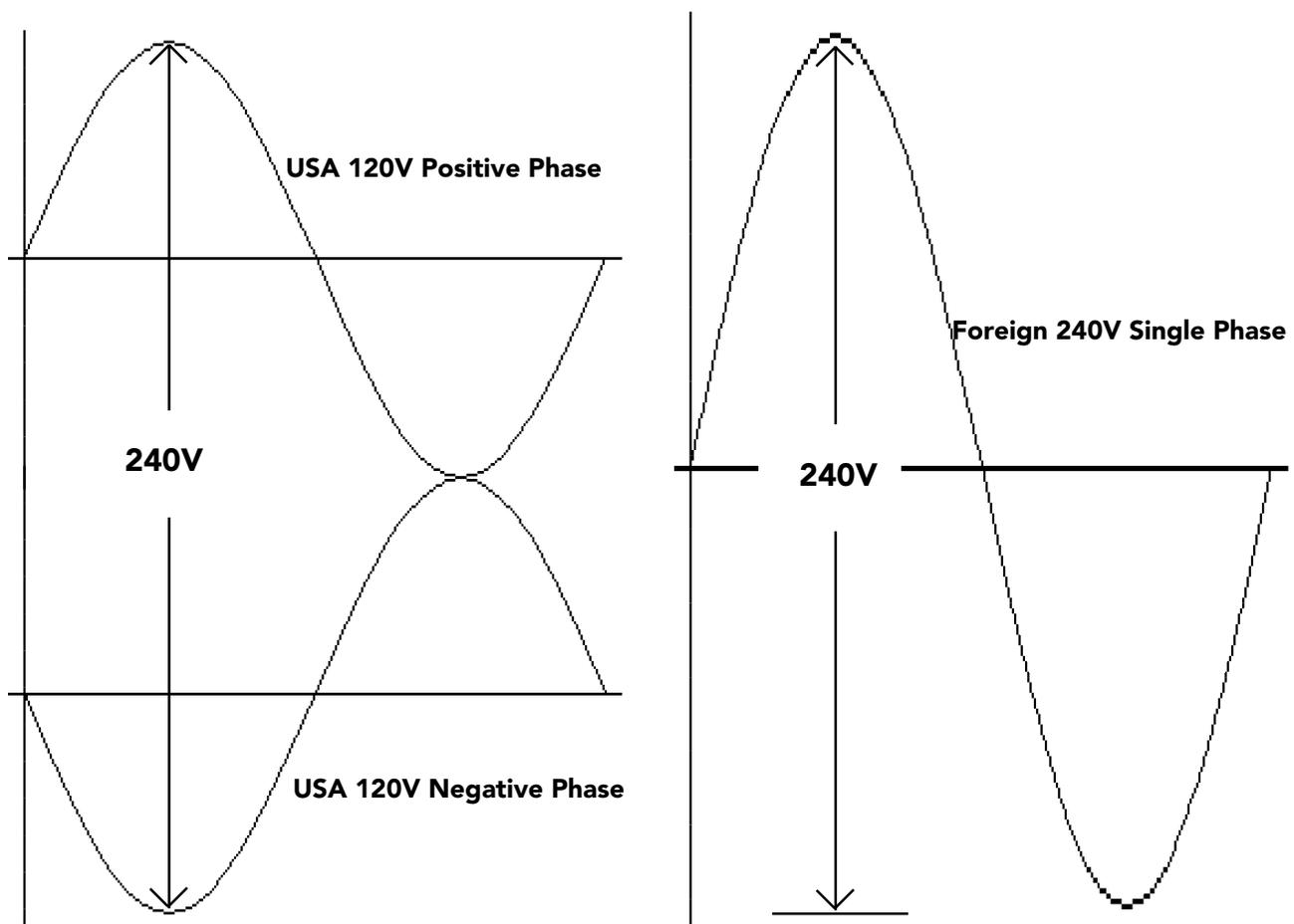
There is yet another fad going around in audiophile circles that suggests that somehow your audio equipment (especially big power amplifiers) will “sound better” if ordered wired for foreign 240 volt use and then operated from a 240V air conditioner line in the United States.

Don't believe it or do it! You risk killing yourself!

The audiophiles have as usual made several very bad assumptions and demonstrate again their utter lack of any knowledge of electronics.

Foreign 240V is completely different than USA 240V. The differences can bite you with lethal poison.

Foreign single phase 240V AC consists of two (or three) wires at the service outlet. The first is the actual 240V hot line (240VAC RMS with respect to ground). See the diagram below.



The second wire is current carrying AC ground. The third wire, if present, is the non current carrying safety ground. This is a similar arrangement to USA 120V single phase AC except that the foreign 240V hot line has twice the voltage and thus is fused at half the current rating for the same energy capacity.

USA 240V AC is completely different. It really is not 240V at all. It is two separate 120V AC hot lines out of phase with each other and fused twice as heavy as normal for special duty use.

In a three wire USA 240V AC system there are two 120V hot lines with a third current carrying AC ground line. There is no non-current carrying safety ground at all.

Using an electrical device wired for residential foreign 240V AC on a USA 240V line risks sudden death several ways:

1. Any transformerless appliance, such as a TV set, depends upon the fact that a polarized power plug allows its chassis to always be at AC ground. If it is connected across the two 120V AC hot wires of a USA 240V system, the chassis will be at a lethal 120V AC potential. Touching a metal part (or the shaft of a control) and an earth ground is an instant ZAP!. Or, feeding its auxiliary audio outputs on to your audio system can carry that 120V to everything else connected. Grab that grab handle and you may never let go!
2. Other appliances can get you even quicker – those with exposed metal surfaces such as foreign 240V power tools with a 3 wire ground. When used on USA 240V, depending upon how the plug is wired, at best case the safety ground is defeated, at worst case the chassis is hot – or lots of power, for a moment – but not really where you wanted it.
3. With an AC power transformer energized device (such as almost all normal high fidelity components) the problems are a bit more subtle to recognize but can be just as hazardous.

First of all, with three wire AC plug devices, the safety ground is perverted. An

electrical fault can leave the chassis at 120V AC potential instead of safely blowing a fuse. You will never know the fault exists until it injures someone. If the equipment (a big power amplifier for example) is connected to other equipment running on normal USA 120V then the interconnect cables become the fuse! You get AC on all the chassis, heavy AC current flow through all the interconnects, lots of blown up equipment, fires, and excitement - until the heavy 30 amp appliance rated fuse on the 240V line blows (remember it was rated for an air conditioner, not a consumer appliance and is fused four times as heavy as the foreign 240V line would have been).

If your amplifier has a two wire AC power line and was wired for 240V foreign use, then hooking it up to USA 240V will do one of two things. If the AC plug is jury-rigged to connect the amplifier between one of the US 120V hot leads and current ground, it simply will not work – it is now connected to 120V instead of the necessary 240V (although messing with the power plug may leave the unit in a less safe mode if a polarized power plug designed to ensure that ground is ground is defeated).

If the AC is wired across the two USA 120V hot lines at the USA 240V power plug then the danger level goes up. To seduce you, the unit may actually work (although you may have more hum than normal and greater leakage currents and tingles). However, if the equipment fails then the internal AC fusing can be defeated, putting one phase of that 120V line live on the chassis with all of the attendant catastrophic failures mentioned above.

SO – DON'T DO IT!

Yes, this is a simplified and not necessarily complete listing of all the possible problems. But, there is no way that 240V wiring will make any amplifier sound better (it simply cannot know the source of its DC energy

assuming the design wasn't hopelessly inadequate in the first place). The only safe way to operate a device designed for foreign single phase 240V AC is with an adequate and fused 2-to-1 step-up transformer, attached to a standard 120V single phase USA power outlet. The power rating of the step-up transformer must exceed the full power requirements of the amplifier. For example, a 200 watt per channel rated power amplifier probably can pull 11 amperes at 120V AC at full power into a low impedance load and thus would need a 1500 watt rated step-up transformer for safe opera-

tion. Unfortunately, it is probably easier to simply replace the amplifier with one designed for USA use than to buy a quiet and conservative step-up transformer. The far east ones available from the discount catalogs tend to be vastly under-rated for their application and run hot, noisy, and likely unsafely with much of a load.

We will not supply any of our equipment wired for 240V for use in the USA. Many of our components can be supplied for true safe 240V use in foreign lands, where 240V is really 240V. In the USA this is simply not the case.

Four New Zero Magnetic Field High Fidelity Loudspeakers from B&W



Model 2001

11.2" x 7.1" x 7.9" two way system with 5" woofer, 1.2" metal dome tweeter, 88 dB efficiency and 4Ω impedance. List price \$199/pair.

Model 2002

13.6" x 7.1" x 7.9" two way system with 5" woofer, 1.2" metal dome tweeter, 88 dB efficiency and 4Ω impedance. List price \$299/pair.

Model 2003

16.7" x 8.2" x 9.3" two way system with 6.5" woofer, 1" polyester dome tweeter, 89 dB efficiency and 4Ω impedance. List price \$399/pair.

Model 2004

25.6" x 8.2" x 9.3" three way system with two 6.5" woofers, 1" polyester dome tweeter, 92 dB efficiency and 4Ω impedance. List price \$549/pair.

The Common Characteristics of the B&W 2000 Series Loudspeakers are Pretty Uncommon:

ZMF (zero magnetic field) technology. All B&W 2000 series loudspeaker systems are fully magnetically shielded. Each speaker incorporates an additional magnet on the back of the drive units. The extra magnet is reversed in polarity so that the combination of the two magnets concentrate the magnetic flux towards the center of the assembly rather than dispersing it. A sealing cap is fitted over the two magnet assembly. B&W says this is shielding done right and thus all these speakers are appropriate for home theater (and computer sound) use.

Remember B&W learned how to make a true high fidelity magnetic shielded speaker years ago with the VM-1 and VM-2 series. They were ahead of their time for video use – video home theater systems were not well developed enough then, but the concept of true high fidelity and TV screen protection at the same time seems to be nearly unique to B&W. *Most think all they need are more channels and more speakers.* B&W reminds you that for high fidelity home theater, you need first good loudspeakers.

Molded non-resonant damped reinforced polypropylene front panel with curved profile to reduce diffraction effects. The 2000 series gives you much more than a plain box or just styling for styling's sake. B&W is one of the few speaker manufacturers that knows that a good speaker cabinet doesn't "sound good." They know that *a good speaker cabinet doesn't sound at all!* Thus just as much attention is given to these new low priced speakers to insure that the cabinets are free of reflections and resonances as with their premium priced products.

Frameless perforated PVC speaker grills to further the goal of low diffractions and acoustic transparency. The goal was better sound and to break away from the "plain box" look at the same time.

Fourth-order vented-box enclosures for good efficiency and smooth low distortion bass response. The -6dB points for the four models are at 68Hz, 58Hz, 55Hz, and 50Hz respectively. The larger models provide progressively better deep bass performance and dynamic range along with higher sensitivity. All use magnetic fluid cooled high temperature voice coils and acrylic damped fibre woofer cones with low hysteresis rubber surrounds.

Available in Black Now – and White near the end of October. Clever little wall mount brackets will be available soon too - for about \$15 per pair. Speaker stands (STAV201s for the 2001, 2002, and 2003 or STAV202s for the 2004) are available right now at \$50 per pair list.

There is more! Two new center channel models are coming. The 2000 IFS (Image Focus System) center channel monitor has two 120mm bass/midrange drivers, a polyamide diaphragm tweeter, and magnetic shielding. A more sophisticated 600 IFS center channel speaker is on the way too – featuring 600 series performance and the neodymium tweeter. We will know more about these two in October.

So - How Do They All Sound?

Sorry, we cannot tell you yet. Our first shipment in of the 2001, 2002, 2003, and 2004 is not here yet. That is one of the reasons *Audio Basics* is a bit late – we wanted to wait for a preliminary listen before finishing this issue.

So – you will need to wait until next month to read about our subjective reactions – or better yet listen to them soon yourself at your local B&W dealer.

The specifications, engineering details, and overall design concepts of this series gives us confidence that B&W has done it yet again and produced an affordable series of home theater speakers that will be more than the equal of the best you can get from video source sound.

Give us a telephone call soon to learn more of our reactions, or read more in the next issue. We can hardly wait for these guys to show up.

The New Omega II FM/AM Tuner!

We are happy to announce a new Omega II FM/AM tuner based upon the Philips FT920 FM/AM tuner at just \$395 complete.

Philips did a really nice job with the FT920 – they got almost all functions and features just right. The unit has thirty presets which you can allocate to either FM or AM stations as you desire. You can program it to read out the station call letters or frequency. You can program it to search only for program categories (defined as Easy, Pop, Classic, Info, Culture, or Other) after you assign your favorite stations to the appropriate category. It scans and searches, or you can tune it by hand (the big knob is electronically connected to the circuit, not mechanically connected). You can also tune from the keypad – entering the frequency or station preset directly. It has local and distant sensitivity and stereo-mono switches. Everything you are controlling reads out in the large attractive blue display.

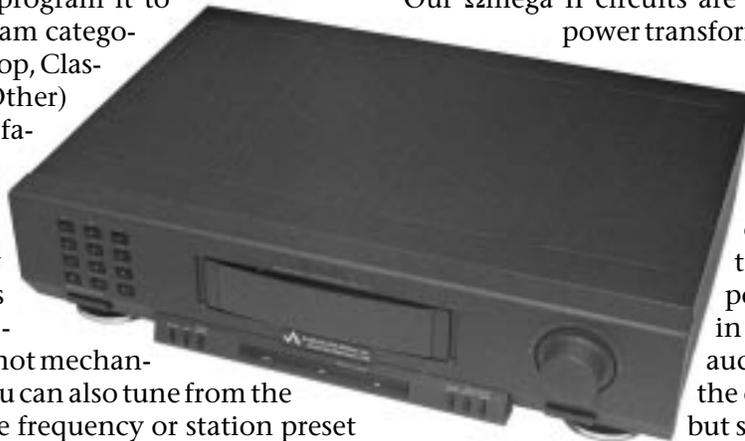
It has a 75Ω F-Connector adaptor for connection to an FM antenna and it includes a very nice AM loop antenna with a built-in stand to locate it away from the tuner chassis for best results.

It is in an attractive dark charcoal grey all metal chassis.

Sensitivity, selectivity, separation, low noise, stability, and usability are excellent.

The only thing Philips did wrong was to forget that the whole purpose of the tuner was to reproduce music. The entire audio circuit is composed essentially of just two bi-polar transistor surface mount chips - one per channel. The sonic signature stock is mid-fi sandy – the sound of another radio. Why oh why after all that work on all the circuits and conveniences ahead of the audio do the designers of mass produced audio appliances seem to drop the ball every time and forget about the original goal – high fidelity? We do not forget about high fidelity. That is why we are in this business.

Fortunately, one no-cost feature Philips gave us in the FT920 was lots of empty chassis real estate. This is the same external package used by their DCC player and an integrated amplifier. The



tuner circuits don't take up all the available space so there was plenty of room left for us (both mechanically and musically).

So we had the room for a true high fidelity audio stage and that is exactly what we have designed in.

In this application, we have installed a whole new independent two channel audio amplifier circuit board, based on the Omega II 300v/μS slew rate preamplifier.

Our Omega II circuits are complete with a new power transformer, new diode bridge, new raw power supply, new regulated power supply and two channels of Omega II line amplifier. We tie our new internal board into the power switch and jump in and out of the Philips audio board – bypassing the original audio circuits, but salvaging the appropriate muting, multiplex filtering, and deemphasis functions. We get the true high fidelity musicality we (and you) want without interference to or with any of the built-in control or protection circuits. All front panel controls function as desired.

The only change is the music! The Omega II Tuner reproduces music with the same ultimate definition, space, and relaxed listenability as our other new audio designs do. Heck, even Rush sounds listenable sometimes – but don't blame us - we are only responsible for the playback quality of the message, not its content.

The Omega II 920 tuner is the most functional tuner we have ever done, with musicality, listenability, and intelligibility to match. We have already completed the first production run and we are getting peas in a pod repeatable performance from sample to sample. The tuner really works nice.

It is available right now, at \$395 plus \$10 shipping in the USA with a limited two year parts and labor warranty and our usual 30 day satisfaction guarantee (subject to the 9% restocking fee and the conditions described in the warranty section of our catalog).

If you have been waiting for a new tuner, wait no more.

USED EQUIPMENT

Super Pas Three Preamplifier. This is an extraordinarily clean AVA wired pure vacuum tube preamp in a very good Dyna Pas chassis. It is complete with the gold AVA jack set, ceramic selector switch, precision volume and balance controls, black AVA faceplate and knob set, good select Chinese tube set, and very fresh construction (built in early 1992). It works and looks like new. The price is \$395.00 plus \$10 shipping in the continental USA. It includes the 8.2 μ F film capacitor upgrade to the line section previously discussed in *Audio Basics* which gives it brand new performance. We will provide a six months parts and labor warranty on all the AVA circuits in this great preamplifier.

Good Used Dyna Pat-4 Chassis for Ω mega II preamp circuits with tone controls. You pay for the new circuit set installed and we will throw in this chassis for just \$25 extra plus \$10 shipping in the USA with a new two year warranty on our circuits too. If you must have tone controls, this chassis is just right for you as tone controls are standard.

Super 70i Vacuum Tube Amplifier AVA wired complete with new AVA power transformer and solid state power supply, new AVA jack set, and all new tubes. This is as nice as a small vacuum tube amplifier gets and is a great match for speakers such as our B&W DM640 with AVA upgraded crossovers. We have several good chassis and can offer this complete package with our brand new insides for \$795.00 complete plus \$15 shipping in the continental USA. These units have a two year parts and labor warranty on our circuits, six months on the chassis and mechanical bits, and 30 days on the tubes. **SPECIAL OFFER (expires 10/15/93) – buy two at the same time and we will throw in a complete Fet-Valve Hybrid Bridge for only \$100 extra and give you free USA shipping too.** This is the lowest price you will ever have for a complete dual-mono nearly 100 watt per channel vacuum tube amplifier package. This combination handles speakers such as the great B&W 801 Series Three with surprising and very pleasing dynamics and

range. I've got a well known movie star running this combination now and loving every musical moment - you might find it is just what you were looking for too.

Ω mega II 500 Power Amplifier – over 250 watts per channel and 2 ohm load driving capability at the best price ever. We built our marvelous Ω mega 500 circuits into this Hafler DH-500 chassis in 1989 and upgraded it to an Ω mega II 500 just last year for the original owner. Now he has moved up to our new Fet-Valve 500hc and all this power and performance are available for you at \$995 + \$25 shipping in the continental USA. It is in a good black chassis with the standard Hafler rack mount faceplate and grab handles and a quiet running three speed cooling fan. The best choice possible for a difficult loudspeaker load or for demanding musical instrument or professional applications. Call soon, this is a rare value and has our six months parts and labor warranty on our circuits.

Transcendence Two DH-110 Preamplifier – complete with AVA phase inverter circuits. This is an unusually good working full function AVA circuit set in a big Hafler DH-110 preamp chassis, complete with switchable tone controls, dual tape monitors, and switchable external processor loop. The headphone jack and filters are out of circuit to accommodate our phase inverter bridge circuits. Our fine discrete solid state circuits preamp circuits of late 1980s vintage make this an unusually clear, dynamic and listenable unit. The built-in AVA phase inverter allows you to run any two stereo common ground power amplifiers bridged mono at triple their normal single channel power. It is in good condition (a little wear but no major dings) and has an attractive black chassis. The optional rack mount ears come with it too. We checked it out and cleaned the controls and switches. It functions just fine and we can offer it to you for just \$225 + \$10 USA shipping with a six month warranty on our circuits (the chassis and mechanical parts and switches are not in warranty).

Frank and Darlene Van Alstine