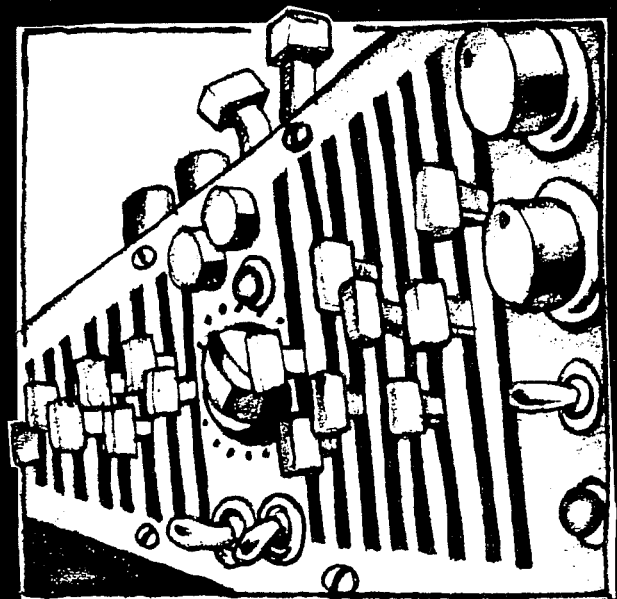
AudioControl

MODEL C22 & C25
OCTAVE EQUALIZER
CONSCIOUSNESS COURSE
(owner's manual)



THE AUDIO CONTROL STORY.

We could be making electric toothbrushes, but we're not.

Audio Control's president made that observation while explaining why we design and build stereo equalizers. Of all the things a group of employees could legally produce in a Lynnwood, Washington factory, we think a device that lets you hear music better is just about the best thing we could be making.

We incubate and hatch our equalizers in a modern plant complete with solder baths, non-stop FM over half a dozen big speakers, a ping pong table in the breakroom, an Irish Setter with a matched set of frisbees, more test equipment than a Japanese sci-fi flick, and employees so friendly that the UPS man regularly stops in to have lunch with us.

Maybe its that we're located out here in the misty rain forest of the Northwest where moss grows on the windshields, the sun rarely makes it through the overcast, and the Boston ferns grow so well they've formed a union. This fertile soil has grown Phase Linear, Speakerlab, Tapco and SpectroAcoustics.

Whatever it is here in the Northwest, we're perfectly content to stay here and keep producing high quality, well-engineered, affordable hi-fi equipment without so much as a glimmer of the sort of greed and me-too-manship that so often pervades the stereo market. We like producing something useful that gives people pleasure without wasting energy or resources. Something nobody else thought of, though should have.

Thus, we're not only interested in what goes out of Audio Control, we're interested in the comments which come back. Our fearless leader still reads every warranty card, suggestions from which have lead to customer-based product changes instead of marketing department speculation.

We're really glad you bought something from us. Our appreciation will come back to you in the thousands of hours of hassle-free pleasure you'll receive from your new Audio Control equalizer.

The People at Audio Control

Congratulations.

You just bought what we think is the best value in an audiophile's ten band equalizer. This manual is to make sure you use and appreciate everything we designed into it. Even though you're dying to grab onto the thing and weave it into your system in a tangle of RCA cords, please take twenty minutes or so to read our sage advice on operating your new audio product. Afterall, it DOES have twenty-five controls, and numerous hook-ups.

First the paperwork.

It's probably futile, considering bringing home electronics such as this equalizer is a lot like Christmas, but FIRST FILL OUT THE WARRANTEE CARD and put a stamp on it. Make sure to keep the sales slip or receipt from the stereo store with your copy of the warrantee info. It's necessary for validation of the warrantee in the remote event of hassles.

Next RECORD THE SERIAL NUMBER OF YOUR UNIT and stash it someplace where light fingers won't snare it if your equalizer gets lifted in the night. Also mark your unit indelibly with your driver's license or social security number if you can. It's not the sort of thought one likes to entertain the day they get a new piece of electronics, but well, things DO happen.

Next save the box.

It would just give your garbage can a hernia, anyway. The box plus the foam end pieces and the plastic bag it was swadled in are necessary for returning the unit to your dealer or shipping it back to us, or moving to Hackensack. You can keep dirty socks or cassettes in it in the meantime.

Where it's at: Placement.

Give, also, some thought to where you wish to place your equalizer. This should be based not only on how you plan to use the equalizer, but on how you listen to your music.

If you intend to use the unit to equalize room acoustics, which entails relatively permanent settings, or if it is being used in conjunction with a tape recorder only, consider a slightly more "out of the way" place for it, where children and guests of all ages will be less inclined to adjust its settings.

If, on the other hand, you intend to experiment constantly with the equalizer, using it as an integral tone control, set it up as close as possible to your existing amp or receiver tone controls. (We have seen truly devoted fans place the unit as close as possible to their favorite arm chair, as far as 10 feet from the rest of their electronics.)

And of course, if you're rack mounting the unit, its position is pre-ordained.

The most crucial hook-up of all.

Notice we haven't said anything about plugging your Audio Control into the wall yet. Now's the time to do so. Note it has no power switch. That's because this equalizer is intended to be left permanently on.

A fire hazzard? Emphatically not.

A power waste? About the same as an electric clock.

Of course if you have an extra switched power outlet on the back of an amp, you can

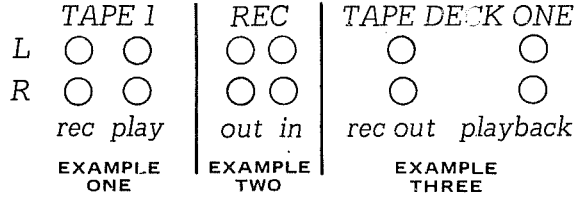
use it. But plugging it into an unswitched (permanently on) socket is perfectly acceptable, unless you happen to have 98 D-cells you want to use instead.

Hooking up the octave equalizer.

There are at least three different ways to hook up your equalizer, depending on how you want to use it and what kind of electronics you're connecting it to. Read through each before you get ensnared in hook-up plugs. And by all means turn off ALL equipment before hooking in the unit. A surprising number of audiophiles find their woofers on the floor after a 60-cycle buzz during hook-up.

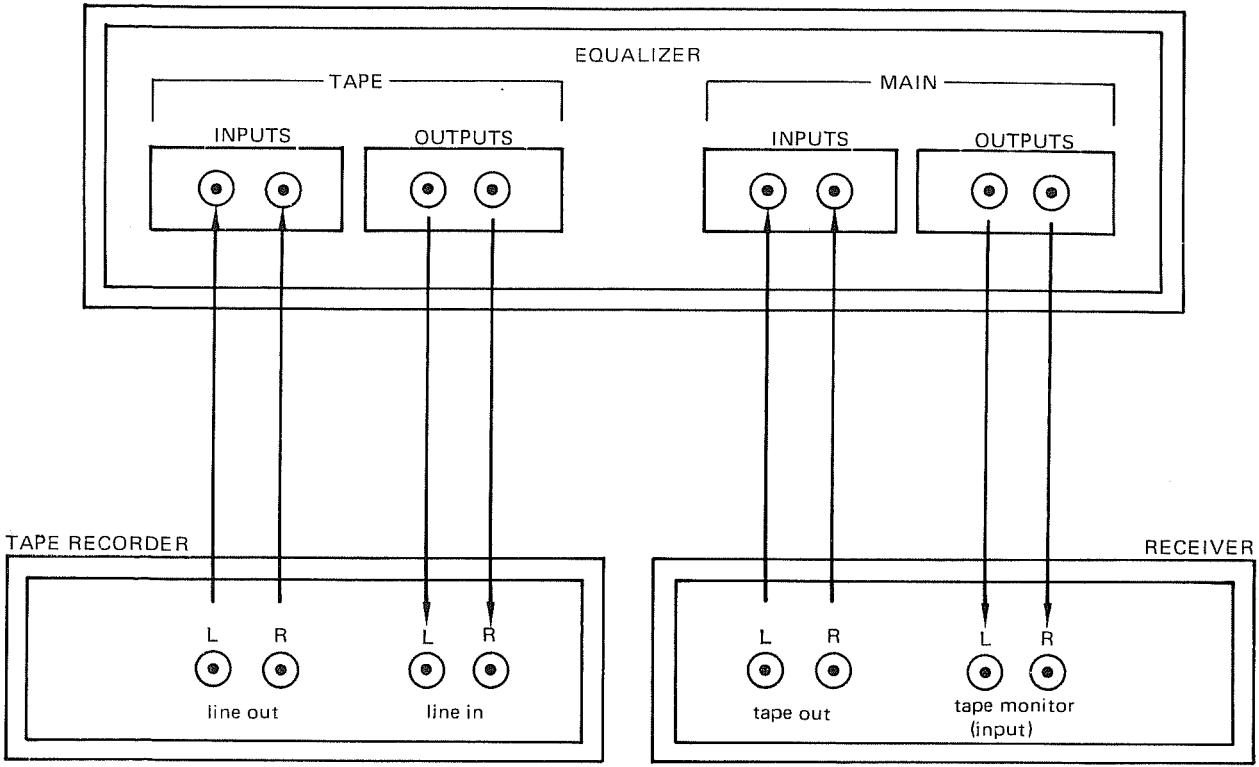
Looping the loop.

The simplest way to hook in your equalizer is to put it in the tape monitor loop of your amp or receiver. That way you can activate it by pushing in the Tape Mon button. Look on the back of your amp or receiver for two or more sets of RCA sockets marked TAPE. Two will say OUT or REC; two will be marked IN or MON.



Hooking up the octave equalizer.

Connect a pair from TAPE OUT to the two sockets on the back of your equalizer marked IN. Now signals coming out of your receiver's TAPE circuit will be routed to the equalizer whenever you push the TAPE MONITOR button.


EQUALIZER
TAPE
MAIN
INPUTS
OUTPUTS
INPUTS
OUTPUTS
TAPE RECORDER
RECEIVER
L
R
L
R
L
R
L
R
line out
line in
tape out
tape monitor
(input)

But we have to get those signals back somehow, too. So connect another set of cables from the equalizer OUT plugs to your receiver's sockets marked TAPE IN. That's all there is to it unless you have a cassette deck or reel-to-reel.

If you do, you can take advantage of a special circuit this unit has. It lets you equalize tape recordings at the push of a button. (More on that on page 13). To pull that nifty trick off you'll need two more sets of RCA cables. Connect one from the IN sockets of your tape deck to the TAPE OUT sockets on the equalizer. The other set brings signals back from the OUT side of your deck to the equalizer's TAPE IN plugs. (Quite a few amps and receivers now have two sets of tape monitors. We're not sure how many of you have two tape recorders, but two monitor circuits allow you to connect another outboard device without including the equalizer, or use your tape recorder separately without the equalizer's circuitry. And if you do have two tape recorders and your two tape monitor circuits have a dubbing circuit (which many do) you can actually use the equalizer to equalize tapes being transferred from one deck to another or equalize the playback of the second deck even though the unit is all hooked into the first tape monitor circuit. Sounds complicated but if you have two monitor circuits you'll know what we're talking about.)

Even if you don't have two tape monitor circuits, you can interconnect your equalizer and any other outboard devices you want together in the circuit. Noise reduction devices, dynamic expanders, click and pop filters or old radar units just go before the equalizer, as shown in this diagram. Especially watch the Dbx122, 128 or 158 whose output must not be equalized while in an encoded form.

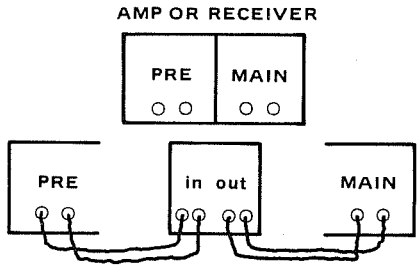
Divide and conquer.

There's a little–used set of plugs on the back of your amp or integrated amp or receiver which allows you to make the equalizer an integral part of your electronics. They're the PRE and MAIN plugs. What you really have is a power amp and a pre–amp hooked together with very short cords. The plugs on the back let you interpose any number of devices between the control section (pre-amp) and power amp, which just amplifies signals. Most super-trick outboard gadgets don't suggest you hook them in here for a variety of reasons. Some of them aren't electronically clean enough. And many of them aren't necessary for constant operation of your system.

The Audio Control octave equalizer is different. Since it's really a set of very specialized tone controls, some audiophiles consider hooking it directly in as a part of the pre-amp. If you aren't using it for tape equalization, and especially if you're using it just for room acoustic equalization, this is an excellent spot in your stereo hook-up.

Don't try it if you're EQ'ing tapes, however, since the pre-amp gain control would also control tape input gain.

Just pull out the two short "U" plugs connecting PRE and MAIN on your amp or receiver. Connect amp PRE to the equalizer's IN; connect the equalizer's OUT to your amp's MAIN. Now the Audio Control is actually part of your amp, just like the tone controls on its front.



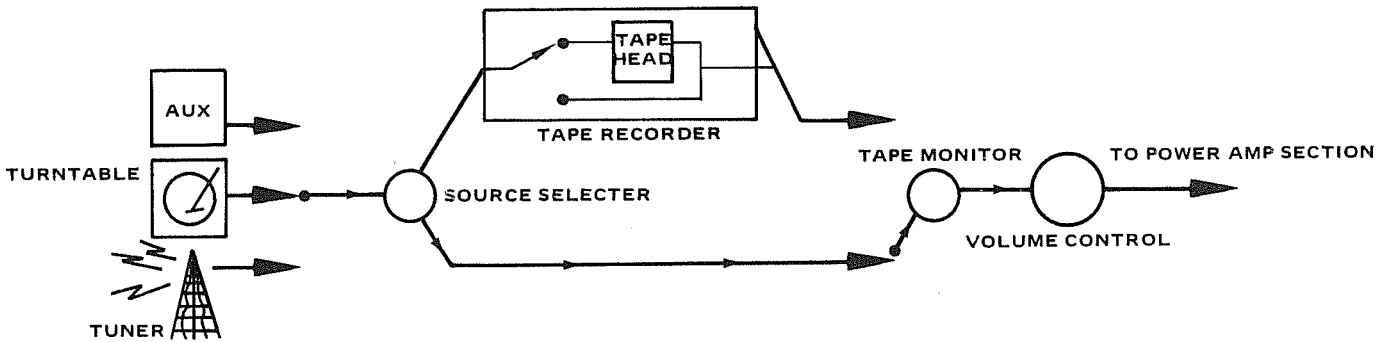
Dividing and conquering the already divided.

The true audiophile has a separate pre-amplifier and one or more huge industrial-strength power amps hulking on his shelf. For them there's no need to dig around for the PRE and MAIN outs: his amplification is already divided. Again, the Audio Control may be inserted as an integral part of the system between the preamp out and the power amp in.

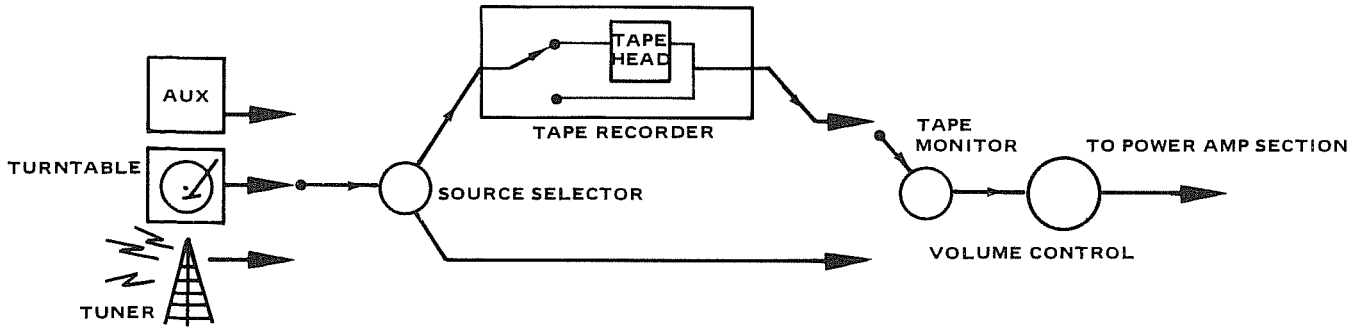
Understanding how an equalizer and other devices are hooked into your amp or receiver.

While it is not mandatory, it is helpful to understand just what is going on when you press the tape monitor button on your receiver or change the source switch.

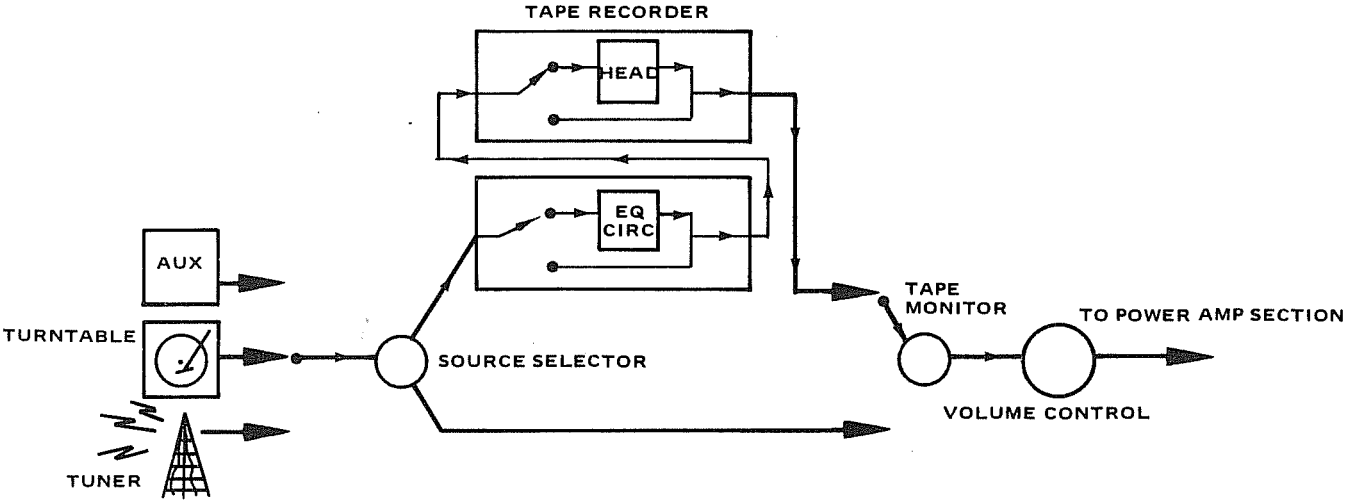
Below is the signal path from the sources such as turntable or FM tuner all the way through to the actual amp.



As you can see, the tape monitor LOOP is just that, a detour through which the signal can be routed. When recording, any of the sound sources are routed to it. When playing a cassette deck, pressing the tape monitor switch routes signals from the deck through the volume control and into the amp.

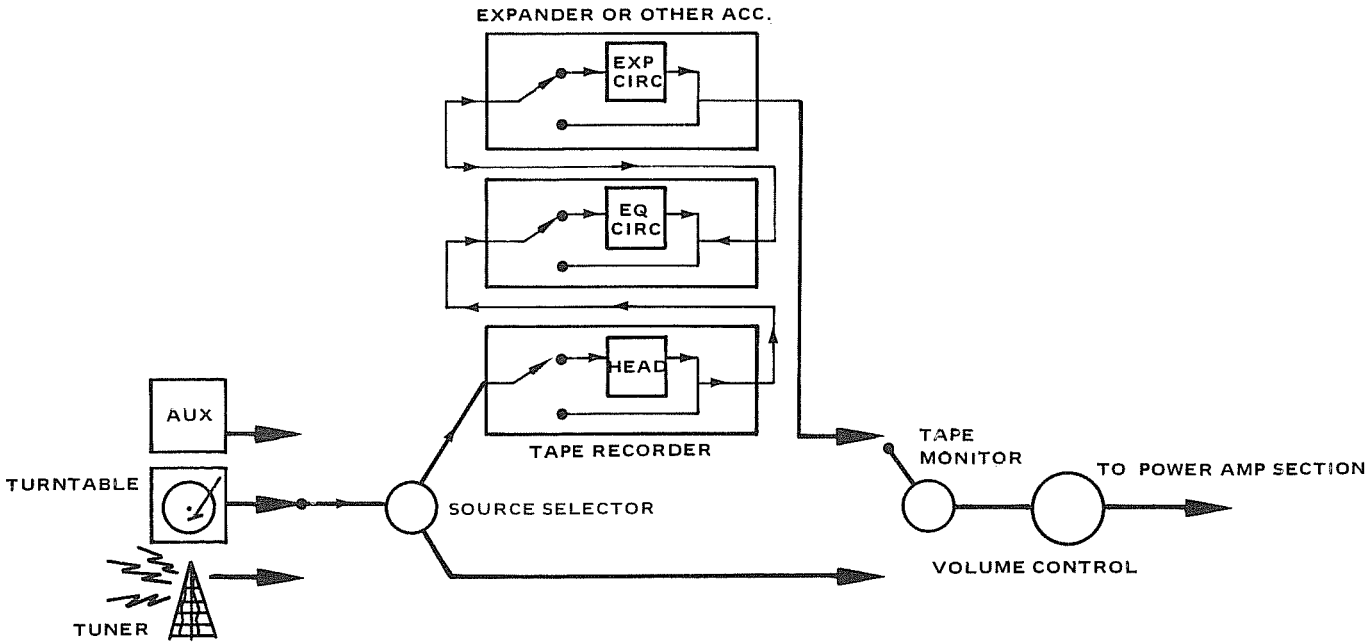


It is into this tape monitor loop that the Audio Control equalizer is placed. With, or in place of, a cassette deck.



Any number of devices can be added into this loop. Each has their own "detour" loop so you can switch them out of the circuit. Here's an exaggerated example.

Since each has a tape monitor switch, you can use any combination of devices and still run a cassette deck in the tape monitor system.



Putting the Audio Control equalizer to work in your stereo system.

Don't panic.

Sure there're twenty-five controls, but using your equalizer is easy once you understand just what all those sliders and buttons do.

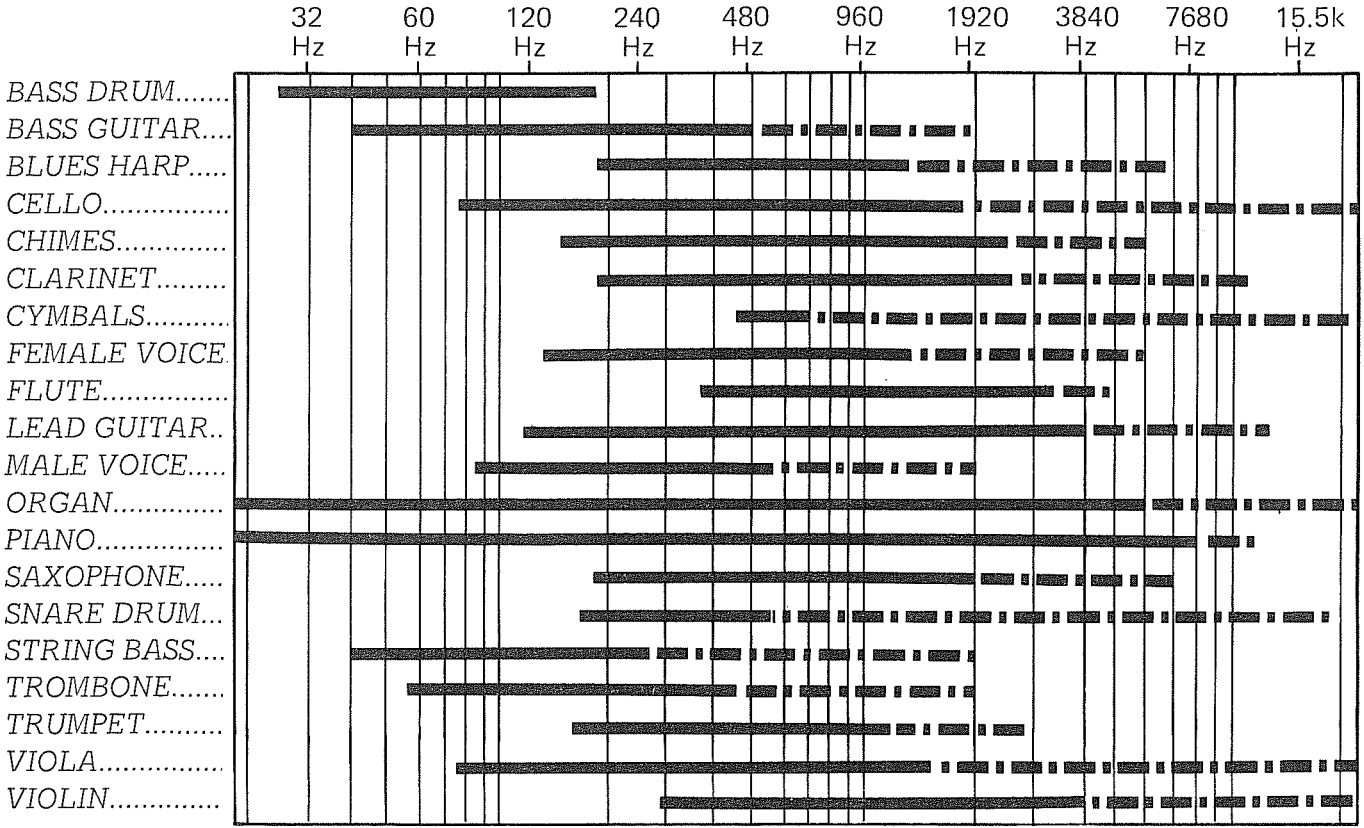
Forget the Audio Control for a minute. Just think sounds.

All natural and recorded sounds are measured in a term called hertz. Not a rent-a-car, but a measure of the frequency or number of vibrations per second. (We'll be batting this term around quite a bit.)

A cymbal's crisp trebel sounds occur at the high end of the frequency spectrum. 10,000 to 18,000 cycles. Most adult's hearing falls off rapidly at around 15,000 so we consider this the top-end of the spectrum.

A bass drum's low thud sounds between 30 and 200 hertz on the very low end of the audio spectrum. We consider 30 cycles about the lowest reproducible sound possible, and the low end of the hearing range.

In between falls every musical instrument, and vocal sound you hear. We've assembled the following chart after consulting with a number of recording engineers and acoustic specialists. It's more than just an informative chart of sound. It's a chart of what you can control now that you have an equalizer. We'll get to just how farther on, but you can see that the Audio Control is far more precise than simple tone controls. In the mean time we're going to familiarize you with the five push switches in a vertical row on the front of your unit.



MUSICAL INSTRUMENT SPECTRUM CHART

To EQ or not to EQ. The EQ LINE switch.

Cynics would observe that this is the switch that lets you get rid of the equalizer when you don't want it. But no one ever seems to want to do that any more than they would their tone controls or volume control.

The purpose of a switch that lets you equalize incoming signals from FM, records, or tapes when pushed in, (and which circumvents the equalizer when left out,) is to let you compare between no equalization and whatever settings you have adjusted your equalizer to. You can reference a Setting to No Setting instantly. This is especially valuable when you're first experimenting with equalization and need to know just how much more or less of a frequency there is with the unit in. But even most recording engineers use this comparison constantly when adjusting equalization in the studio, so it's valid anytime.

The recording engineer button. EQ TAPE.

This is the button that lets you equalize tapes by running signals coming into the tape recorder through your Audio Control first. Most 10-band equalizers don't have this ability to tie into your tape circuits without getting in the back and fiddling with the plugs.

Just push EQ TAPE and your unit is ready to equalize tape recordings. Just how to adjust the controls is covered farther on. The EQ TAPE is interlocked with the EQ LINE button to prevent them both from being pushed at the same time. This prevents the possibility of feedback in a 3-head tape deck situation.

The hearing aid. TAPE MON.

If you have a three head tape deck you can actually monitor the tape as it is being made. So you have three different ways to

listen to sound being equalized during recording:

1. *Sound entering the equalizer (EQ LINE out)*
2. *Equalized sound entering tape deck. (EQ TAPE in)*
3. *Sound leaving tape deck. (TAPE MON in which can be clicked in and out during recording for comparison).*

That's a monitoring combination so nifty you ought to run out right now and buy a tape deck if you don't have one.

Catching mono in the bass. The PHASE CORRELATION RUMBLE REDUCER BUTTON.

The Audio Control octave equalizer has a circuit not found on any other component being made in this world. A device that tightens up your system's bass response without even touching the equalizer's tone controls. Quite simply, this switch cuts turntable rumble, eliminates acoustic feedback and even reduces the "thump" that occurs if you lower the cartridge too quickly onto a record when your amp volume is turned up.

About the best way to explain its function is to play a record and click it in and out. The differences are dramatic. NO OTHER EQUALIZER HAS A CIRCUIT SUCH AS THIS. After you've tried it you'll see why. And you'll never switch it back out.

Now, stereo's a wonderful phenomenon and we have nothing against it. But at very low frequencies – for most folks, under 200hz – directionality and the stereo effect is totally un-noticable. Bass drums and bass guitars just aren't mixed into the stereo field anywhere but right in the middle anyway. So this switch isn't, for 99% of listeners, affecting the accuracy of the music. Rather, it's just making your electronic's job easier in an area fraught with intermodulation and power supply difficulties. You'll hear what we mean.

GETTING RID OF INVISIBLE MONSTERS
or
You never have to clean your Subsonic Filter.

Subsonics are just what their name implies: sounds below the range of human hearing. You don't need them.

In fact, you shouldn't have them. Here's why.

Your speakers insist on trying to waste energy and motion reproducing them. Warped records, turntable rumble, the thump made when a tonearm is lifted off the record, the interference between stations when dialing FM and the feedback caused by placing a turntable close to the speakers all can literally beat a woofer to death.

Amplifier power is wasted and since the speaker is trying to reproduce sound you don't hear, it messes up audible sounds (intermodulation distortion), especially in a 2-way system where the woofer is also handling some of the midrange chores.

Reflex and vented speaker systems particularly are prone to this sort of potentially destructive woofer cone movement.

If you have such a system, ALWAYS leave the subsonic filter button on. To tell if your speaker system is vented, remove the grille cloth and look for a hole leading into the enclosure. If there is one and you can feel a motion of air when you play the system, you have a vented or reflex system, rather than an acoustic suspension, sealed box system.

The Audio Control octave equalizer uses a sophisticated 3-pole, 18dB per octave subsonic filter to do away with subsonic interference for good, and without any audible side effects. The bass response of your system will sound more solid and in most cases you can safely use a more powerful amplifier. Just press the button...not a bad deal!

How to make a sonic room. Model C-22

Sound doesn't just come out of your speakers. and disappear into the woodwork. It bounces around. Some frequencies bounce better than others.

Very high frequencies, for example, are absorbed by carpets and drapes and upholstered furniture. Inversely, in a bare room with hardwood floor and plaster walls, the highs bounce around and seem magnified to your ears.

Low frequencies also tend to resonate (or bounce around rhythmically).

This is why large auditoriums and even larger living rooms are so "boomy". A certain frequency range is getting accentuated by continuing to bounce around. Not only does this make your ear think there is more of a certain frequency coming out of a speaker or off a record, it tends to muffle sounds because they're still bouncing around when other sounds are being made.

Start at the speakers.

Where your speakers are and how they are set, can affect their sound long before you begin to adjust them with an equalizer. Boosting highs or lows by correctly positioning your speakers is a lot easier on your electronics than forcing them to pump out more of a frequency.

If you're getting too much bass, if the sound is boomy, get your speakers out of the corners of the room and up off the floor. Raising a speaker even 12" or moving it three feet out of a corner lowers bass.

More likely, you're not getting enough bass. Even though you bought an equalizer to rectify that situation, first start by making sure your speakers are in corners and close to the floor. This is the best way to boost bass because it does not require more amplifier power. You can always add even more later.

If positioning doesn't help, use the octave controls. How that's done is covered in the next section where we treat its true function, getting more out of your speakers by acting as a tone control.

If your speakers don't have any knobs or switches on them, you can ignore this section. If they do, now is the time to set them right.

If your speakers have knobs, turn them all the way down. If there is a multi-position switch, set it to "off". Now put your ear between the woofer and the mid-range and turn the midrange knob until the sound seems to blend.*

If your speakers have switches, use the same proceedure, clicking the positions as you go from least to most treble and midrange.

* A footnote for those who don't know a woofer from a tweeter. Take off your grille cloth. Count the speakers. If there are two, the big one is the woofer and the little one is the tweeter. If there are three, the medium-sized one is the midrange.

How to make a sonic room. Model C-25

Before you begin using your equalizer as a tone control (described in the next section), we'd like to explain just how you can use it to make the acoustics of your listening room better.

A lot of things can make a so-called flat tone get bent as it bounces around your living room. Soft or textured surfaces drink up treble notes, for example. Since the actual vibrating air waves of sound over 8,000 hertz are microscopic they become absorbed by surfaces with irregularities. Such as drapes, sofas, carpeting, pillows, acoustical ceiling tile or spray texture, house plants, house cats and velvet wallpaper. Reflective surfaces such as plaster walls or hard floors do just the opposite: they reflect and "amplify" highs.

Low notes and midrange sound often end up just the opposite: not only do you get them, sometimes accentuated, you often get them back a couple of times as resonances.

Model C25 only:

The Audio Control octave equalizer can help your speakers transmit less of those frequencies which are getting unnecessarily boosted and more of those which are getting absorbed. Doing this requires making sure the rest of your stereo system is not cutting down or accentuating frequencies.

1. *Start by connecting a stereo patch cable between the "Pink Noise" outputs on the Audio Control C-25 and the "aux." inputs on your amp.*
2. *Turn your volume control up. You'll hear a sort of throaty version of the sound heard between TV channels when the picture is just snow. That's "pink noise", random points of all frequencies. Be sure that the tone controls on your amp are set flat.*
3. *Now just start fiddling with various equalizer sliders and listen to how the sound quality varies. Return all controls to flat and continue.*
4. *If possible, remove the grill cloths from your speakers and locate the L-pads or tone switches. Place your ear half-way between the woofer (the large speaker) and the midrange. If your speaker has only two speakers (a woofer and a tweeter) place your head between them.*
5. *Adjust the midrange control (sometimes called "presence") until the sound coming from both speakers seems to blend in your field of hearing. The tweeter control should be turned to neutral.*

6. *Next blend the midrange and tweeter with your ear halfway between them adjusting the tweeter L-pad or "brilliance" control.*

Now your speaker is theoretically putting out "flat" pink noise, equal amounts of all frequencies. Back away from the speaker and move to your listening position.

You'll probably hear some subtle changes in the quality of the roaring sound you hear. Particularly listen to the very high rushing air sounds. Do they seem to decrease as you move away? If so, you are losing treble frequencies.

But before you even begin to touch the 8K and 15.5K sliders, make sure the speakers are pointed directly or almost directly towards you. Treble is very directional and it may be you can gain highs just by pointing the speaker. Think of the tweeter as a flash of light beam which should be shining at your ears.

If that doesn't work, gently move the 8K and 15.5K sliders on both channels of the Audio Control up no more than 6dB. Now move close to one speaker. Then back to your listening position, then to the other speaker. Compare the amount of highs close with the total from both speakers far back. If there is any difference – and there very well may be due to one speaker bouncing off a drape or tabby cat –decrease or increase only that channel until the sound is balanced.

By this time you should 1) be getting proficient at hearing differences in what first sounded like rushing air; 2) be feeling faintly ridiculous trapsing back and forth across your listening room. But we're not through.

Pink noise can also get the boom out of your bass. Once again move back and forth between each speaker and your listening position.

If it is pronounced, your speakers are going to bonk like jukeboxes – or have been.

That may be your old definition of "good bass" but now that you have an equalizer, you can do better.

Again, there is a remedy for bass resonance that doesn't even require an octave equalizer. Raise your speakers 12" or move them out from the corners, if that's where you have them.

If the pink noise still seems to get deeper as you back up, lower the 120hz slider 6dB and the 250hz slider 3dB or so.

Again, compare speaker outputs to determine if any more or less is needed for the individual speakers.

These settings are average. If you have an absolutely dead room, you may have to really crank on the 8K and 15.5K slider as much as 9dB with smaller boosts at 1K and 4K.

If, however, your living room is nothing but hardwood floors, plaster walls and uncurtained windows, you may have to reduce the same settings almost as much to compensate for all the trebel that's bouncing around.

There are much more complicated methods for equalizing your room using analyzers and calibrated mikes and stuff, but unless your brother-in-law is an acoustic engineer, we think our method, with GENTLE adjustments in the bass and treble, can help a room be less boomy, more or less live and generally a better listening environment.

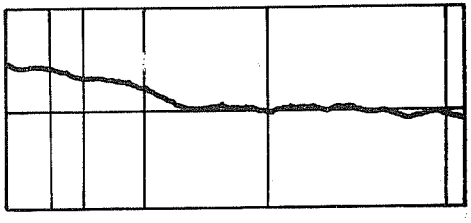
As a final test, put on a favorite record. Switch the LINE EQ in and out and compare the difference. "I'm no technician," you say. "How can I trust my fledgling room acoustic adjustments?" Trust your ears because they're the ears that are going to listen to music in the room. You trust them to tell you whether you like an album. Pink noise is a lot simpler to listen to than that.

Pep talks aside, it's time to begin using your equalizer for what you probably bought it for. Fiddling with the sound of your music.

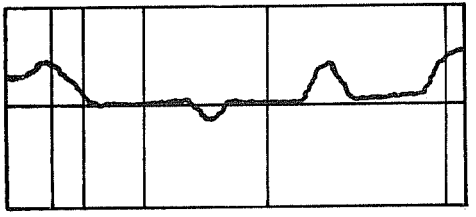
The Audio Control Equalizer as a glorified tone control.

First check back to our big chart of music sound frequencies. Note which sliders correspond to which instruments. So if you like bass guitar, you can't single out one slider and expect bass drum or toms or tubas to stay the same level.

Rather, you should remember how you used your bass and treble tone controls. If you wanted more bass you turned up the whole bottom end. Graphed out, that would look somewhat like this:



The Audio Control is capable of far more specific curves which represent boosts and cuts in specific areas. Like this:



But they are not just pushed around independently of each other. Rather, smooth "curves" have been formed much like those on the electronic graph. That, incidently, is why equalizers like this one are called "graphic equalizers": you can see the effect of the sliders by their positions.

The sliders that shook the world. 36Hz, 60Hz, 12Hz, 250Hz.

The bottom four sliders on your unit correspond to what is normally called the bass section. You can see by the chart that much of low percussion, bass guitar and even low male voices fall in this area.

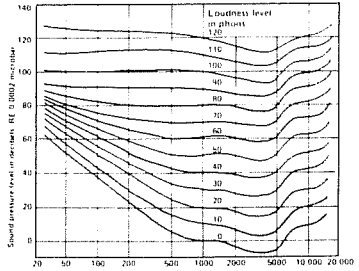
But turning up the bass control on your amp does not achieve what an equalizer can. A lot of this has to do with most speaker system's inability to reproduce the whole spectrum we've just charted for you. In reality most woofers (low bass reproducers) kick out lots of bass at 60 hertz and considerably less below that. Now, 60 hertz bass is what we call boomy – remember we hunted it down in the Sonic Room section.

With the Audio Control you can make boomy speakers put out less boom and more deep bass. That's why we suggest cutting frequencies at 120 and even a little at 240.

The next two sliders are the frequency areas you were always trying to boost when you turned on the LOUDNESS button or cranked the BASS all the way up. The bass below 60 hertz is where almost all speaker systems start giving out. No offense to speaker makers but this is a devilishly hard range to get an 8" or 10" woofer to put out as much of as higher bass. It's the deep rich thud you like to hear. The true bass you can now have by boosting 60hz. And if 60hz is hard for a speaker to put out, 36Hz. is darn near impossible. Even if the woofer had an easy time of it, there's not all that much 36Hz information IN records and tapes. It's just too hard to record and reproduce properly. Such a pity. Thirty-six Hz is the bass you FEEL as well as hear. The gut-rocking, chestshaking, nic-nak rattling bass. Don't be afraid to push this slider up since

there isn't that much material there to accentuate in the first place.

Bringing them forward or moving them back. 500, 1K, 2K, 4K.



The proverbial Fletcher-Munson effect.

The next four sliders control the core of music. The melodic instruments, the voice – almost everything we associate with melody. This is the area of hearing our ears are naturally attuned to. It's the part of our hearing with which our ancestors heard animal cries, the shouts of their tribe, rushing water, rustling leaves and crackling fires. In this chart you can see that nature prudently arranged so our ears don't need as much of these frequencies to sound as loud. (That's why so many people boost the LOUDNESS control on their receivers – it boosts music about like the chart with lots of extra highs and lows.) In addition, this is the sound area which tells us how far away a sound is. A whisper at 6" and a shout at 100 feet may have the same sound intensity, but you can clearly tell the relative distance of each.

So it is with music. Careful adjustment of the 500, 1K, 2K and 4K sliders can literally move a singer or a whole band closer to you in your listening room. In the same way, it can take overly fatiguing passages which are literally hurting your ears (remember how little of this sound area you need in comparison to that of very high and very low) and back them off slightly.

Again, you're probably compensating for your speakers somewhat. Most speakers put out

quite a bit of midrange: the Audio Control can back this output off to more reasonable levels.

An exception is the two-way speaker system with just a woofer and a tweeter. They often crossover at about 1K where neither is doing a very good job. If vocals have never had all the presence they could have on your two way system, a slight boost at 1K may be the answer.

Remember, the center of the human voice is at about 1K. Raise it and the singer approaches. Lower it and they recede. Two thousand and four thousand also play a part in presence, especially in women's voices. Put on Joni Mitchell or Linda Ronstadt and see what a little boost at 2K and 4K does. But don't fall in love.

Getting very high.

Highs are almost as hard for some systems to put out as lows. Many tweeters give up somewhere above 13,000Hz. Some even lower. Don't get mad at your system. Give your equalizer a pat on the case and then work with the 8K and 15.5K sliders. Easy on the 8K, heavy on the 15.5. Boosting them will crisp up cymbals, put that edge of breath on vocals, bring you close to twelve-string fingerings, make a violin zing and a synthesizer absolutely fry you.

It's an exciting part of sound you never could experience turning up your treble control.

Three honorable considerations.

1. *Don't forget to compensate for any room equalization settings you might have added earlier. If they're fairly complicated, write them down so that if you zero-center all sliders, you can remember to add the room EQ.*
2. *Don't totally write off your albeit heavy-handed receiver tone controls. Used in*

small amounts WITH your equalizer they can be beneficial. Dig up your owner's manual and see just where they affect the tone. The numbers will make a lot more sense now that you have a graphic equalizer to "chart" them on. You'll see that a "bass" control often starts at the 5th (!) octave control. Still, a little will help tilt the whole low end. Just remember: what you're doing is far more general than the Audio Control, but then sometimes generalizations are the way to go.

3. *Macho boosting of the 120, 60 and 36Hz sliders can really max out an under-powered amp. Almost 80% of your amp's input goes into the bass. Boosting the 60Hz slider 12dB can literally triple your amp's demand for power. If it doesn't have it, clipping occurs and your speaker tweeters can die in a burst of glory.*

Don't be heavy-handed until you know your amp can handle it. And don't drive the amp as loud when you have a lot of bass equalization. You were probably turning it up so loud to get more bass or treble anyway, and that's what the equalizer can do so well without killer volume.

HOW TO BE A HIP RECORDING ENGINEER.

Your Audio Control octave equalizer is every bit as good as the 10-band equalizers used in professional recording studios (we think better).

Consider this fact, too. Of all the outboard equalization devices avialable to the studio engineer, the octave graphic equalizer is the most often used. For changing the sound of a whole mix when making master tapes.

You have the most basic studio equalization tool in your home right now and you can use it just as the pros do.

Equalizing car tapes.

Car 8–track or cassette tapes can be graphically improved with your equalizer. In a car, different acoustic properties are encountered and speakers are considerably more limited in their frequency response. So your equalizer can help make complicated tonal adjustments not possible with the crude controls found on car decks.

120 and 250Hz

Here's a case where these frequencies can be cut for good effect. The small drivers used in car systems usually resonate in this frequency range causing an overabundance of sound. Cutting this frequency range back a little has another advantage, and that is that it will help reveal the lower bass that we are going to talk about in the next paragraph.

60Hz

Add some, since this is the really good bass area, but remember car speakers don't go this low too easily and will draw enormous amounts of power doing so.

36Hz

Many true, died-in-the-wool car stereo nuts totally roll this frequency off as much as 12dB., when equalizing a car tape. The Rational: Car speakers can't handle this low sound and putting it on the tape invites saturation at a lower volume point anyway.

Midranges

Car systems are notoriously midrangy and you should be able to make a nice downward curve in this area to compensate for the overabundance of mids in cars.

8K and 15.5

While most car speakers put out sufficient 8K highs, almost none do justice to the crisp, tingling zingy highs at 15.5. Boosting these highs NOW, instead of with the "tone" control on the deck means you are only boosting musical highs, not tape hiss highs.

Equalizing home tapes.

If you really get into adjusting your Audio Control, you'll find that almost every album can be improved in some way and that your speakers can always be improved. Which can mean different settings for each album.

Not if you transcribe them to reel-to-reel or cassette with the EQ TAPE switch in. Now you've captured the EQ setting permanently and can use the equalizer only to compensate for speaker and room problems. Or leave the EQ LINE totally out and just enjoy the subsonic and mono bass settings.

Recording instruments.

First, let us say that your Audio Control's PHYSICAL ENCLOSURE IS NOT DESIGNED FOR THE RIGORS OF SOUND RE-INFORCEMENT USE AND IS NOT WARRANTED FOR SUCH APPLICATIONS!! In other words, the electronics are professional grade but the case is not armoured for months on the road or getting crammed into a lounge band's equipment case.

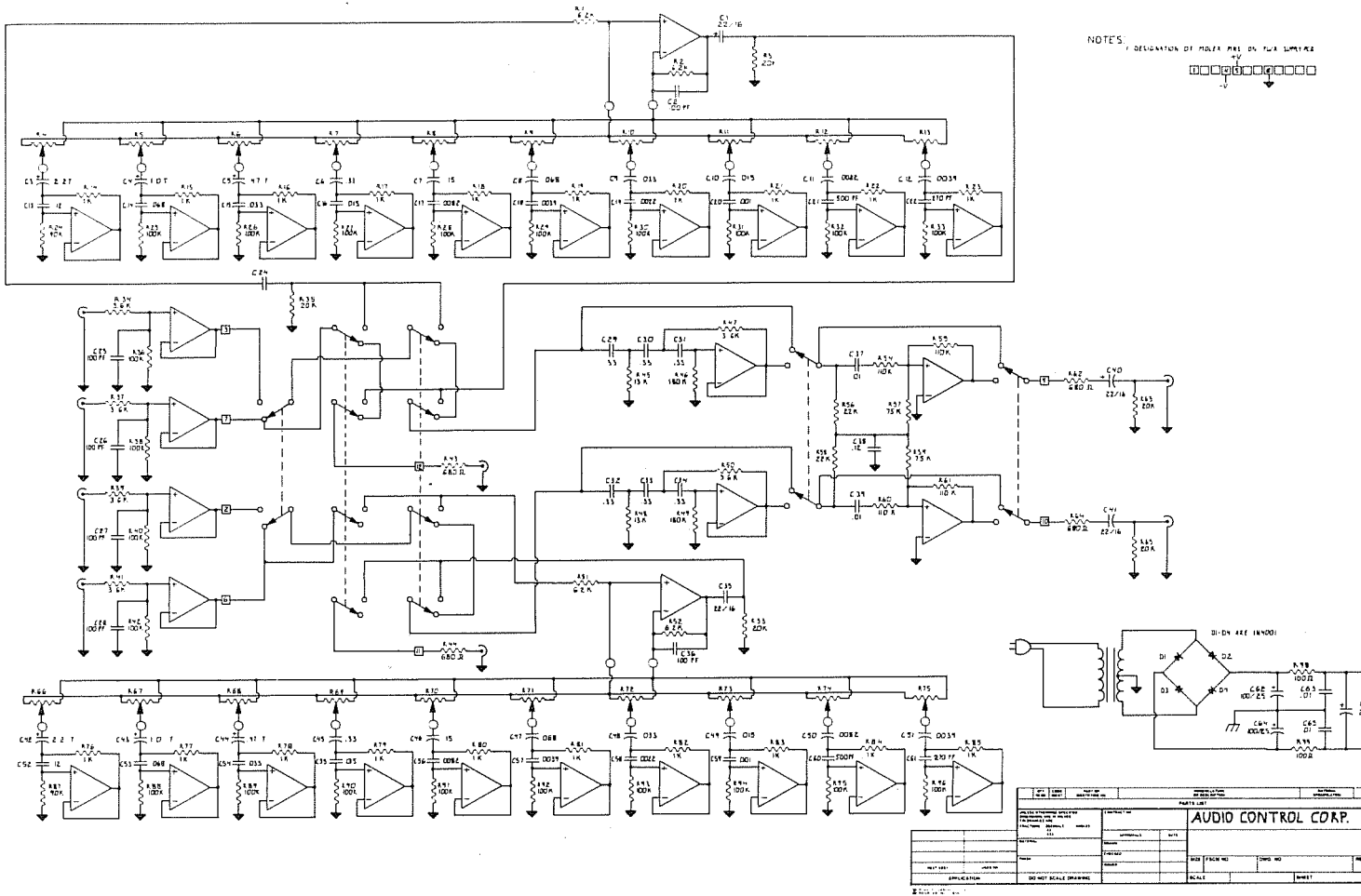
Its applications in a recording studio are obvious, though, and we think it does every bit as good a job as much more expensive 10-bands, so if you have a home recording set-up, the Audio Control is well suited. Even if you just have a single mike and plink a guitar or piano onto cassette once in a while, your equalizer can improve sound. Refer to the chart of musical sound frequencies for insight into which ones to vary to change which sounds.

SPECIFICATIONS: MODEL C-22

DISTORTION:
less than 0.04% (at 1 volt from 20Hz to 20kHz)
FREQUENCY RESPONSE:
from 3Hz to 100kHz, plus or minus 1dB
HUM and NOISE:
minus 96dB re 1 volt, minus 102dB re 2 volts, (10kHz bandwidth)
MAXIMUM INPUT: 7 volts
MAXIMUM OUTPUT: 7 volts
INPUT IMPEDANCE: 100Kohms
OUTPUT IMPEDANCE: 680ohms
CONTROL BANDWIDTH ("Q"): 2.5
CONTROL CENTER POINTS:
32, 60, 120, 480, 960, 1920, 3840, 7680, 15.5kHz
CONTROL RANGE: PLUS or MINUS 15dB
SUBSONIC FILTER:
18dB/octave Tchebychev alignment
SUBSONIC ROLLOFF RATE:
–1dB @ 25Hz, –3dB @ 20Hz, –21dB @ 10Hz
SIZE: 19"(48.2cm)W, 3.5"(8.9cm)H, 6.5"(16.5cm)D
standard EIA rack mount
WEIGHT: 6.75 lbs.(3.2kg.)

SPECIFICATIONS: MODEL C-25

DISTORTION:
less than 0.025% (at 1 volt from 20Hz to 20kHz
FREQUENCY RESPONSE:
from 3Hz to 100KHz, plus or minus 0.75dB
PINK NOISE GENERATOR:
designed to drive the "aux" inputs of any standard amplifier, pre–amp, or receiver
BALANCE of SPECIFICATIONS SAME AS C-22


NOTES:
AUDIO CONTROL CORP.

An introduction to the Audio Control Conditional Warranty.

People are scared of warranties. Lots of fine print. Lots of noncooperation. Months of waiting around.

Well, don't be scared of this warranty. It's designed to make you rave about us to your friends. It's a warranty that looks out for you and helps you resist the temptation to have your friend who's "good with electronics" try to repair your Audio Control product.

Also, warranties help us keep track of our customers so we can let you know of any modifications, dangers or improvement. The old factory recall thing. Now that doesn't mean you're going to get put on a mailing list, and get weird Aztec porno or free deodorant samples. Your name and address on the warranty are strictly confidential to Audio Control.

So go ahead and read through your warranty, then enjoy your equalizer for a few days before sending in the warranty and any comments.

Conditional Warranty.

"Conditional" doesn't mean anything ominous.

The Federal Trade Commission makes all manufacturers use the term to indicate certain conditions you have to meet before they'll honor the warranty.

If you honor these conditions, we will warrant all materials and workmanship on your Audio Control product for one year from the date you bought it, and will fix or replace it during that time.

Here are the conditions that make this warranty conditional:

1. *You have to fill out the warranty card and send it to us within 15 days after you have bought your Audio Control Product.*

2. *You must keep your sales slip or receipt so you have proof of when, and from whom, you bought your equalizer. We're not the only company to require this, so it's a good habit to get into with any hi-fi purchase.*
3. *Your Audio Control product has to have been originally purchased from an authorized Audio Control dealer. You don't have to be the original owner to take advantage of the one year warranty, but the date of purchase is still important so be sure you get the sales slip from the original owner.*
4. *You can't let anybody who isn't (a) an authorized Audio Control service center, (b) the Audio Control factory, or (c) someone authorized in writing by us, work on your Audio Control Unit. If anyone other than a, b, or c messes with it, that voids the warranty.*
5. *The warranty's also not in effect if the serial number has been altered or removed, or if the Audio Control unit is used improperly. Now, that sounds like a big loophole, but here's all we mean. Unwarranted abuse is (a) physical damage, (Our consumer products are not meant to prop up bookcases or get hauled around in toolcases, etc. This is a home hi-fi unit, not a bash-it-about utility equalizer, so if you bash it up, we can't be responsible.). (b) improper connection, patch the phone jacks into a line socket or hook it to the speaker terminals on your power amp and we aren't responsible...high input signals could fry the innards, (c) sadistic things you shouldn't do to any electronics, such as get them wet, too hot, dirty, etc.*

Legalese Section

Assuming you conform to nos. 1-4, and it's not all that hard, we get the option of deciding whether to fix your old unit or give you a new one. If we think it's fixable, we get to decide whether it can be fixed at a service center or sent back to the factory.

This is the only warranty given by Audio Control. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Promises of how well your Audio Control product will work are not implied by this warranty. Other than what we've covered in this warranty, we have no obligation, express or implied. Also, we will not be obligated for direct or indirect consequential damage caused by a defect or warranty claim express or implied, or damage to your system caused by hooking up the Audio Control equalizer.

Failure to send in the properly completed warranty card negates any service claims.

What to do if you need service.

First, contact Audio Control. In writing at: 6520-212th SW, Lynnwood, WA 98036 (attn: Service Department). Or by phone at: (206) 775-8461.

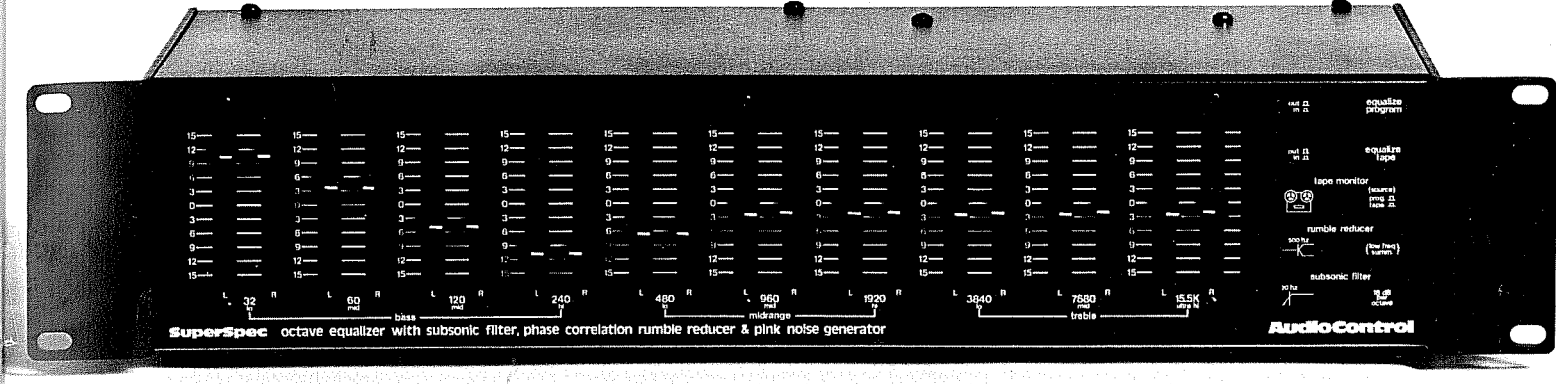
We'll direct you to an authorized service center or make arrangements to have the unit sent back to the factory for service.

In either case, proof of purchase must be included with the unit. (That sales slip or receipt we've been harping about.) –And a brief note telling us what's wrong with the unit. (You'd be surprised how many folks forget to do this.)

The normal service time at the factory is less than one week.

You're responsible for freight or postage when sending it to the factory or service center. Actually, we recommend UPS emphatically over the Pony Express Postal Service. It's more reliable and faster, too.)

We'll pay return freight and practice what we preach about UPS on the return.


equalize program
equalize tape
tape monitor
rumble reducer
subsonic filter
bass
midrange
treble
SuperSpec octave equalizer with subsonic filter, phase correlation rumble reducer & pink noise generator
AudioControl

AudioControl 6520 212th St. SW B-1, Lynnwood, WA, 98036 printed in the USA