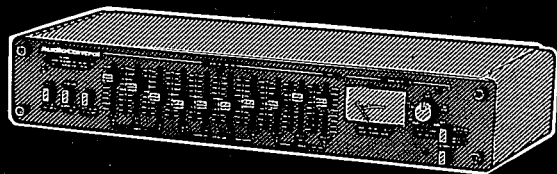


# THE D-11 ANALYZER SECTION CONSCIOUSNESS COURSE.



WORK.

radio with  
first

ANTEE.

it a  
and

LIP  
WAY

unlikely

ll

the

ne receipt

10

d for

ngs us to

on:

AL NUMBER

arthest

...things

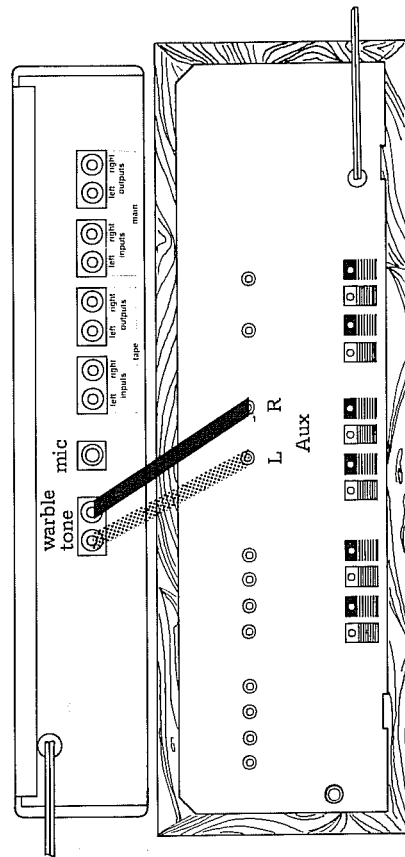
ers don't

## MAKING THE WARBLE WARBLE.

Now that you've gotten the EQ part of your D-11 hooked up, it's time to deploy the part that makes the D-11 so unique: The analyzer portion. It has two more simple connections. One hooks up the warble test tone up to your hi-fi and the other connects the Measurement Microphone into the D-11.

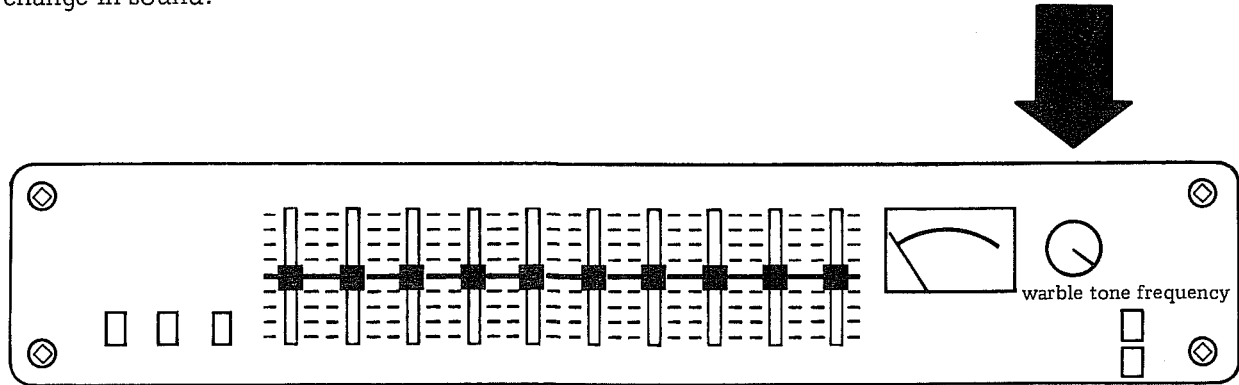
Blow the cobwebs off the input jacks marked AUX on the back of your amp or receiver. Finally, you're gonna use them for something!

Now locate the sockets on the back of the D-11 marked "WARBLE TONE". Take the sets of patch cords provided and hook the sockets on the D-11 to the AUX inputs on your receiver back. Left and right don't much matter since the output is mono anyway.



Now fire up your trusty receiver, turn the input selector to AUX and listen for the Star-Wars type sound.

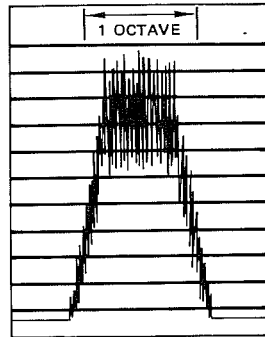
That's warble tone. Twiddle the D-11 warble tone frequency knob and notice the change in sound.



## WUTS WARBLE?

What is this strange video arcade sound and how can it be used to adjust room and speaker? Basically, a warble tone is a rapidly oscillating tone of fixed amplitude with specific frequency parameters.

Well, actually that didn't sound too basic. In English, that means it's a tone that oscillates back and forth within a certain range, (in this case, one octave). It's like a little "window" of sound output. (see illustration)



If everything goes well—no room or acoustic distortion and perfect speakers—then our ultra-flat microphone will “see” this window exactly. But if anything isn't right with the room and speakers within that octave, the “window” is distorted, the meter will droop and you'll know to compensate in that area.

One question we're asked is how does the warble tone differ from the pink noise. Well, pink noise is an entirely different test medium to fit a totally different kind of metering device: LED's. It's equal parts of each octave. In a unit like our C-101 you project pink noise from 32-16,000Hz and then look at the whole spectrum through the C-101's all frequency “window”.

The D-11 uses a dB meter which only “looks” at one octave at a time. So we provide a test medium which evaluates one octave at a time.

Is it accurate?

Very. Killer scientific instrument microphone manufacturers such as B&K use warble tones to calibrate their incredibly accurate lab mikes. And our tone is very much like theirs.

In either case, though, the basic concept is still this: Put a "perfect" signal in one side; read the "imperfect" output on a perfectly flat mike, and you'll know what imperfections are being contributed by the room acoustics and speakers.

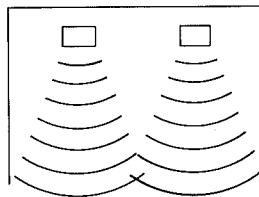
And so on to some analysis even Woody Allen would like.

## GETTING YOUR HOUSE IN ORDER.

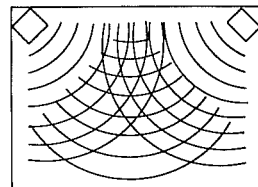
Before you fiddle around with equalization, you should do everything you can to improve speaker positioning and L-pad balance.

First let's consider speaker positioning. This breaks down into two concerns, 1) high-end propagation and 2) bass propagation.

No tweeter is as good a radiator of highs as it could be. They all tend to be somewhat directional. That is, you hear more highs directly in front than you do as you move around to the side of the speaker.



At least three feet away from corners cuts bass addition.



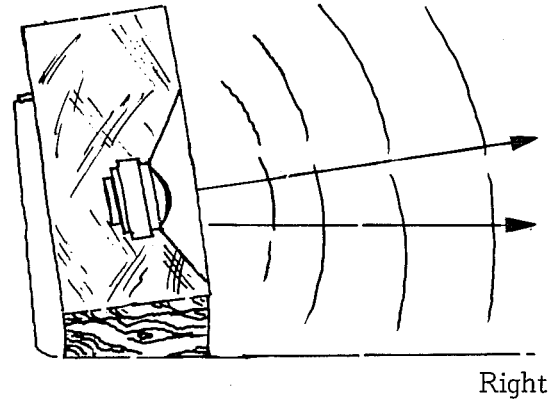
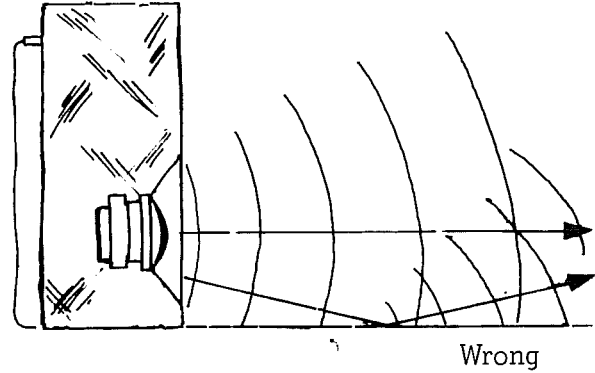
Corners act as horns to increase bass.

Thus, you want to make sure that your speakers' tweeters are pointing directly at your listening position.

If they're on the floor, this may mean tilting them up slightly toward your listening position. If you have them up on bookshelves, make sure the tweeter is lowest and that the whole speaker isn't much higher than chest high. All this ensures that what highs your speakers do put out can get to your ears in a straight line.

Speaker placement also dramatically affects bass. Put simply, bass is increased when you put a speaker in a corner or close to the floor.

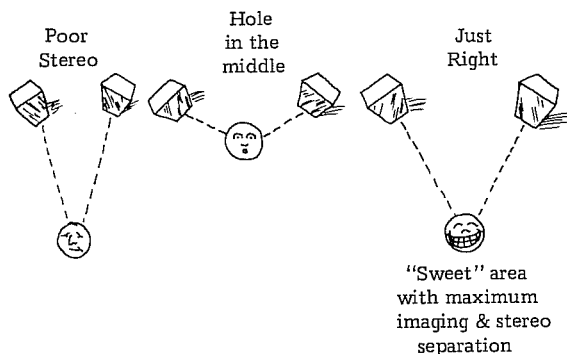
Sometimes this is good and sometimes it's bad. The type of speaker you own, how big its woofer is and what kind of music you play all have effects. Experiment around between placing speakers in corners and moving them out into the room.



If you like rock and pop music we recommend corner placement to boost bass (since you have an equalizer/analyzer you can cut down on the frequencies which get too exaggerated).

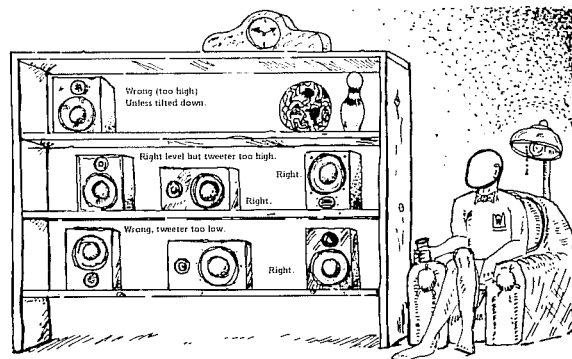
Whether or not to place speakers directly on the floor is also a consideration.

Some speakers tend to bounce midbass off the floor and out at the listener, causing sort of a doubling effect. This resonance may not be desirable.



Whether you should invest in a speaker stand which elevates the whole shebang and eliminates floor resonances can be determined with some beer or pop cans. Elevate each speaker with four of 'em and then play some music with lots of bass. If "bonkiness" is cut down without losing really low bass, stands will be a help.

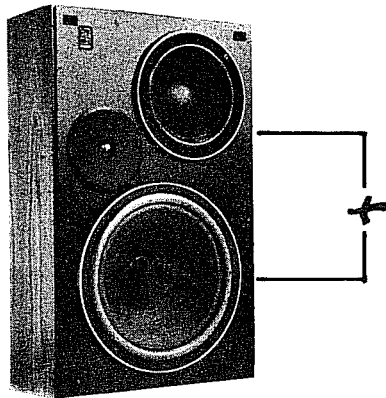
Again, we philosophically tend toward increasing bass naturally with floor/corner placement as much as possible since it can always be *reduced* with the D-11. Much more efficient than boosting bass electronically.



## WHAT THE "L"?

Two and three-way speaker systems have switches or knobs (L-pads) on them to control output of the tweeter and midrange in relation to the woofer which gets to go full blast all the time.

We could tell you to "consult your speaker's owner manual" for info on this but that's a cop out because either they didn't tell you much to start with, or the instructions got buried in your closet somewhere.



Theoretically the L-pad controls were intended to help integrate the speaker with the room, but you have the D-11 for that. So what we suggest is you just try to get the speaker elements to "blend". That may not mean a neutral setting for the L-pad controls, though.

Tune your FM receiver between stations to get a hissing sound. Now turn down your receiver treble control all the way and turn up the bass all the way. While this is only a crude approximation of pink noise, it is a constant sound with which to adjust your speakers.

Place your ear between the tweeter and midrange on one speaker. Adjust the tweeter control until the rushing sound seems to "blend" between midrange and woofer.

If you have two-way speakers there'll only be one adjustment to "blend" tweeter and woofer.

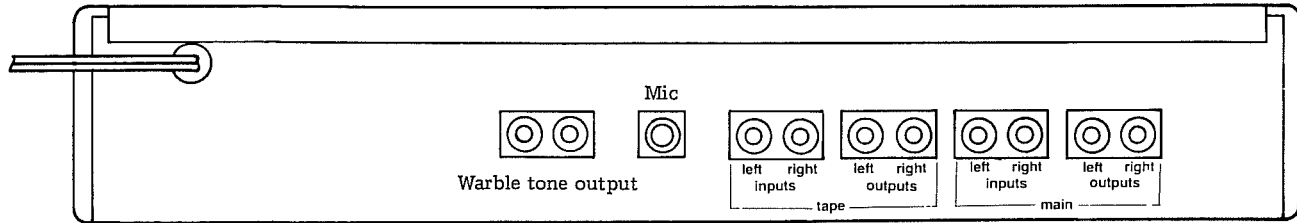
Now you have your speakers and room ready for warble tone analysis.



# THE AUDIO CONTROL MEASUREMENT MICROPHONE.

Time to hook on the D-11's ears.

Locate the single RCA socket marked  
MICROPHONE on the back of the D-11. Plug  
the mike into it and unfurl the 20' cord.

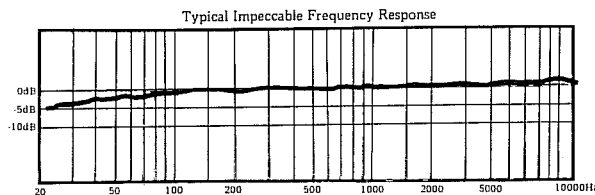


The Audio Control laboratory microphone is a precision, non-directional, phantom-powered condensor type; designed ONLY for the measurement of acoustics. It is intended for use ONLY with the Audio Control D-11 analyzer/equalizer. Do not attempt to use it for voice or music recording, or with any other phono-jack input on tape decks or amps.

Also, don't plug any other microphone into your D-11's rear phono-jack unless you are contemplating potential destruction to your mic. Condensor microphones such as the Audio Control laboratory microphone require a power supply. That's what the term "phantom-powered" refers to: A viable supply within the analyzer. So the phono plug on the Audio Control microphone is actually a mono-microphone plus a + 5 volt input. Not at all the sort of thing you would want to plug a regular mic into.

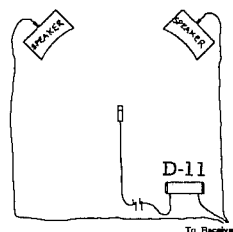
The actual microphone element exhibits a typical response that is as flat as other very expensive (\$200 and up) "laboratory" reference microphones. It is your foundation for making accurate readings with your analyzer.

Even a few years ago such a microphone would have been prohibitive in cost for the home audiophile. Luckily, high-quality condensor elements have broken through the same barrier that pocket calculators, pong games and tiny TV's have so now you possess an accurate and affordable reference microphone. Enjoy!



# FOREPLAY.

- ☐ 1. Make sure the D-11 and your amp or receiver are turned on.
- ☐ 2. Set the D-11's sliders at ODB and make sure that your receiver's treble, bass, loudness, low cut, high cut and icemaker knobs are either out or set at zero.
- ☐ 3. Place the Audio Control Measurement microphone in your listening area with its element pointing between the speakers. If you listen sitting down, make sure the element is at the same height as your ears. You might tape it to a chair back, for instance.



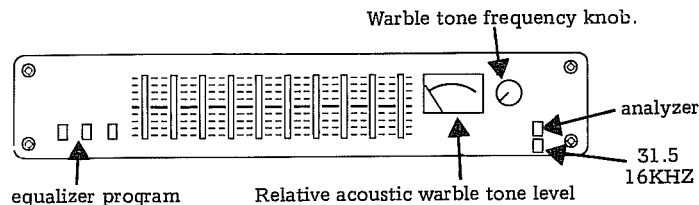
☐ 4. Push the *equalizer program* and *analyzer* buttons on the D-11.

☐ 5. Switch your receiver to AUX.

☐ 6. Press in the square button at the righthand **BOTTOM** corner of the D-11 front plate. It's labeled "31.5 to 16KHZ".

☐ 7. Set the D-11 *warble tone frequency knob* to 1K.

☐ 8. Turn up your receiver volume control while watching the D-11 meter until the needle is *actually* at zero dB.



## DOING THE DEED.

Now you have calibrated the system and are ready to learn the awful truth about your speakers and room acoustics.

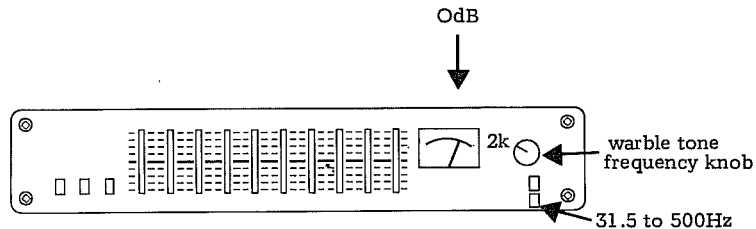
□ 1. Turn the *warble tone frequency knob* clockwise to 2K. Now adjust the 2K equalizer slider until the meter needle is exactly on 0dB.

□ 2., 3., 4., Repeat this step using the 4K, 8K and 16K sliders, turning the *warble tone frequency knob* to the appropriate position each time.

□ 5. Now set the button at the lower right hand corner of the D-11 to the "out" position, labeled "31.5 to 500Hz".

□ 6. Adjust the 500Hz slider as in steps 2, 3, 4.

□ 7. Rotate the *warble tone frequency knob* counterclockwise to 250Hz.



☐ 8. Do the same for 125Hz, 62.5 and 31.5. There's a pretty good chance you won't be able to get the dB meter needle all the way to zero at these low frequencies unless you have pretty gigantic woofers, but don't hesitate to move the slider a full 12dB if that is necessary to get the needle close.

Now you have performed a rough equalization of room and speakers. But since each slider setting interacts with its adjoining sliders, it is necessary to repeat the process once more.

☐ 9. Push the lower righthand button in again to the "*1Khz to 16Khz*" position. The *warble tone frequency* should now be 1K.

☐ 10. Repeat steps 1-8 again. You'll find the amount of adjustment is quite small this time around.

## WHAT HAVE I DONE?

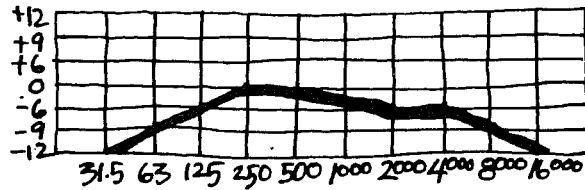
Sit back and look at the curve made by the D-11 sliders.

The amount that the curve deviates from 0dB is how far from "flat" your room and speakers were making the sound.

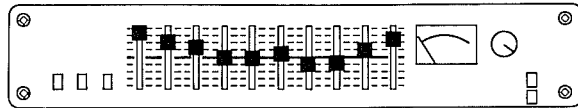
We've included some blank charts in the back which you can use to draw the curve if you'd like to compare it to others. Just plot the values backwards. That is, plot +4dB as -4dB, etc. What you now have is a plot of your speakers in your room. Doesn't look much like the one in the owner's manual, literature or magazine review does it?

For explanations as to why, refer to the appropriate section in the D-10/11 Equalizer Section manual.

Also, compare the final setting with our suggestions on how to adjust various types of speakers were making the sound.



Plot the values shown by the sliders on the D-11 backwards. That is, plot +4dB as -4dB.



## REPEAT WHEN NECESSARY.

When's necessary?

Re-analyze whenever you 1) move your speakers, 2) re-adjust your L-pad controls 3) get new speakers 4) drastically change your room acoustics.

That would include adding a bunch of carpeting, drapes, lots more upholstered furniture; or removing carpeting, adding chrome and glass etc.

One drastic EQ change is when you fill a room full of people. If you could ever get a whole room full of partying people to stand around while you warbled at them, you'd find a BIG change. Bodies drink up mids and highs quickly.

A room full of full-grown wombats is particularly nasty in this respect. Compensate by never inviting more than three marsupials to any one party.

## ADJUSTING TAPE BIAS AND EQ.

As more and more tape decks feature adjustable bias and EQ settings, the D-11 can provide a quick way to fit a particular tape formulation to your deck as well as determine exactly how well your deck is really recording.

☐ 1. Switch your receiver REC SOURCE button to AUX.

☐ 2. After inserting a cassette, put the cassette deck on REC/PAUSE so that the meters or fluorescent bars are reacting to the warble tone.

☐ 3. Set the *warble tone frequency knob* to 8K.

☐ 4. Adjust cassette deck RECORD LEVEL knob until the cassette deck meters read -20VU.

☐ 5. Now record a short segment, noting its position with your cassette deck footage counter.

☐ 6. Adjust the cassette deck bias control incrementally. Start at one extreme setting and move the bias knob one increment after each 5 digits of the tape counters goes past.

☐ 7. Change the D-11 warble output to 16K and repeat the entire operation.

☐ What you now have is a series of segments to play back, each recorded at a different bias setting.

☐ 8. Watch the D-11 level meter during playback of both the 8K and 16K segments. The 16K segment with the HIGHEST output is the optimum bias setting. Use the 8K segments to doublecheck.

You can also use this method to evaluate the whole audio spectrum on a given type of tape and deck. You'll find that the only notable deviations occur at the very low and high octaves, though.

Concentrate on 31.5, 63, 125, 8K and 16K. Test both at -20VU and OVU.

The results can be surprising. You might even note a *boost* at 63Hz. This is caused by something called head contour effect. If it is pronounced, you might consider cutting this frequency just a bit when recording with EQ.

## **MIXING SETTINGS.**

The question arises, how can you do all the nifty fiddling outlined in the other manual if you have arrived at fixed settings using the analyzer.

The is to simply add (or subtract) the appropriate room/speaker EQ values from the various EQ's we suggest in the D-10/11 equalizer manual.

Remember, you do NOT have to add the room/system EQ values when recording a cassette tape, so that cuts out some complications right there.

Use the graphs provided to make up composite settings, for example, "room/system EQ + loudness curve" or "room/system EQ + killer-heavy-metal-sounds-best" etc.



## HITTING THE ROAD

Cars REALLY need equalization. What with all those surfaces in a small volume with funky little 6" speakers you'd be appalled at the result.

It isn't that wacko an idea to haul your D-11 (or at least one end of the mike) out and warble analyze your car.

Make sure the door is closed, though.

Instead of hooking the warble generator into the cassette deck, just make a warble cassette on your indoor cassette recorder and haul it out to the car.

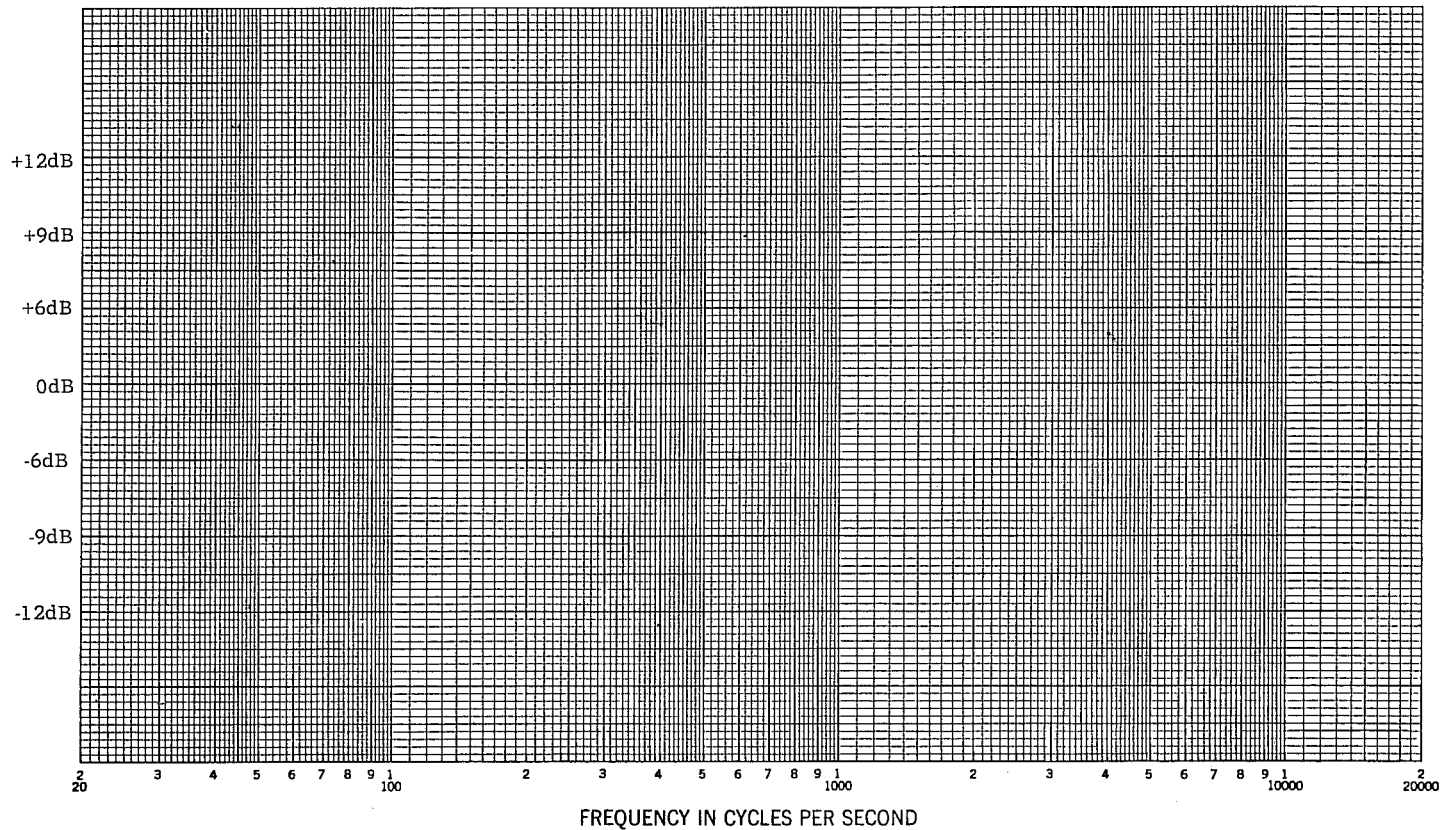
After recording the analyzer settings, make a new tape incorporating compensations to verify the settings.

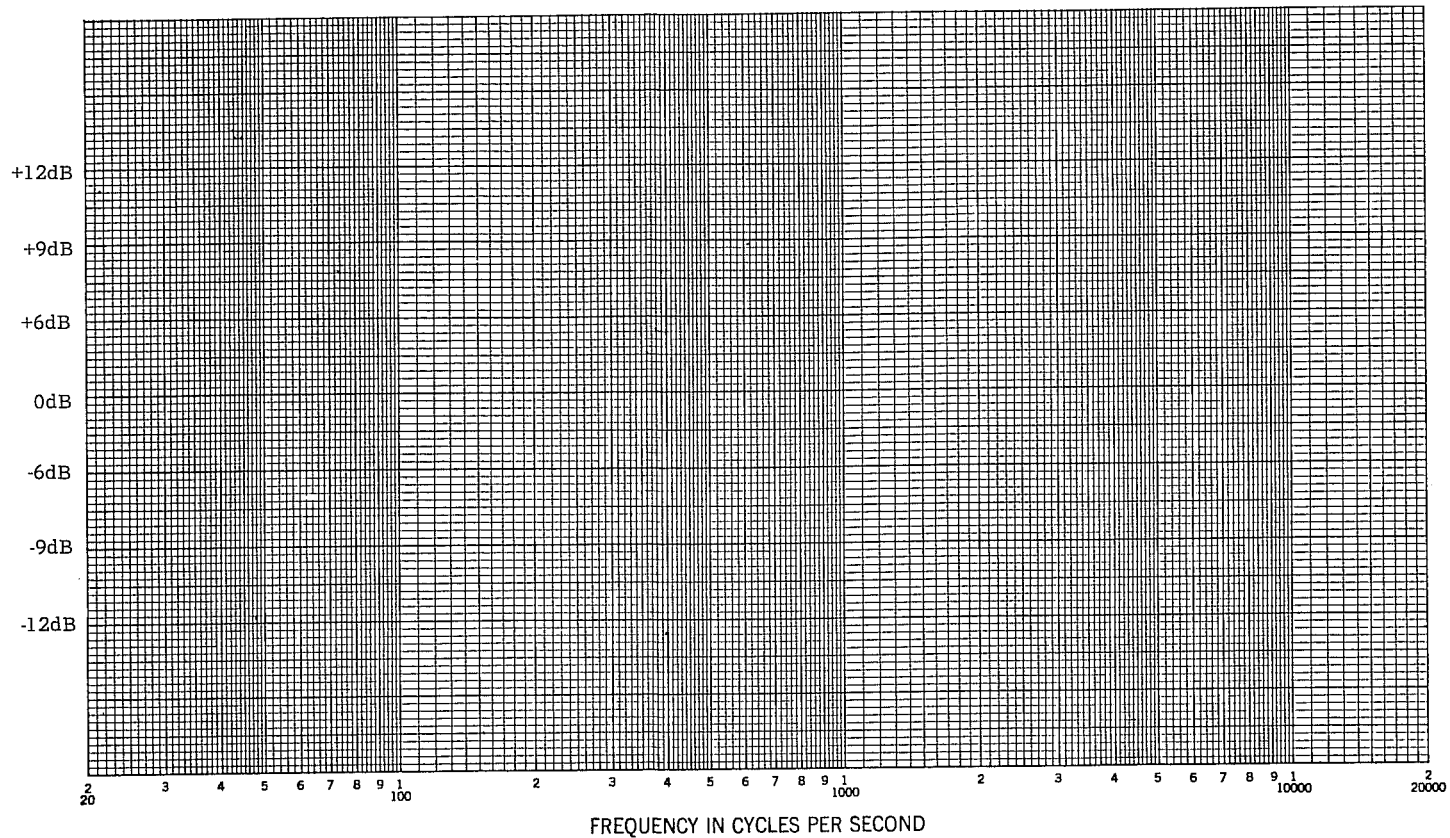
## MORE HELP.

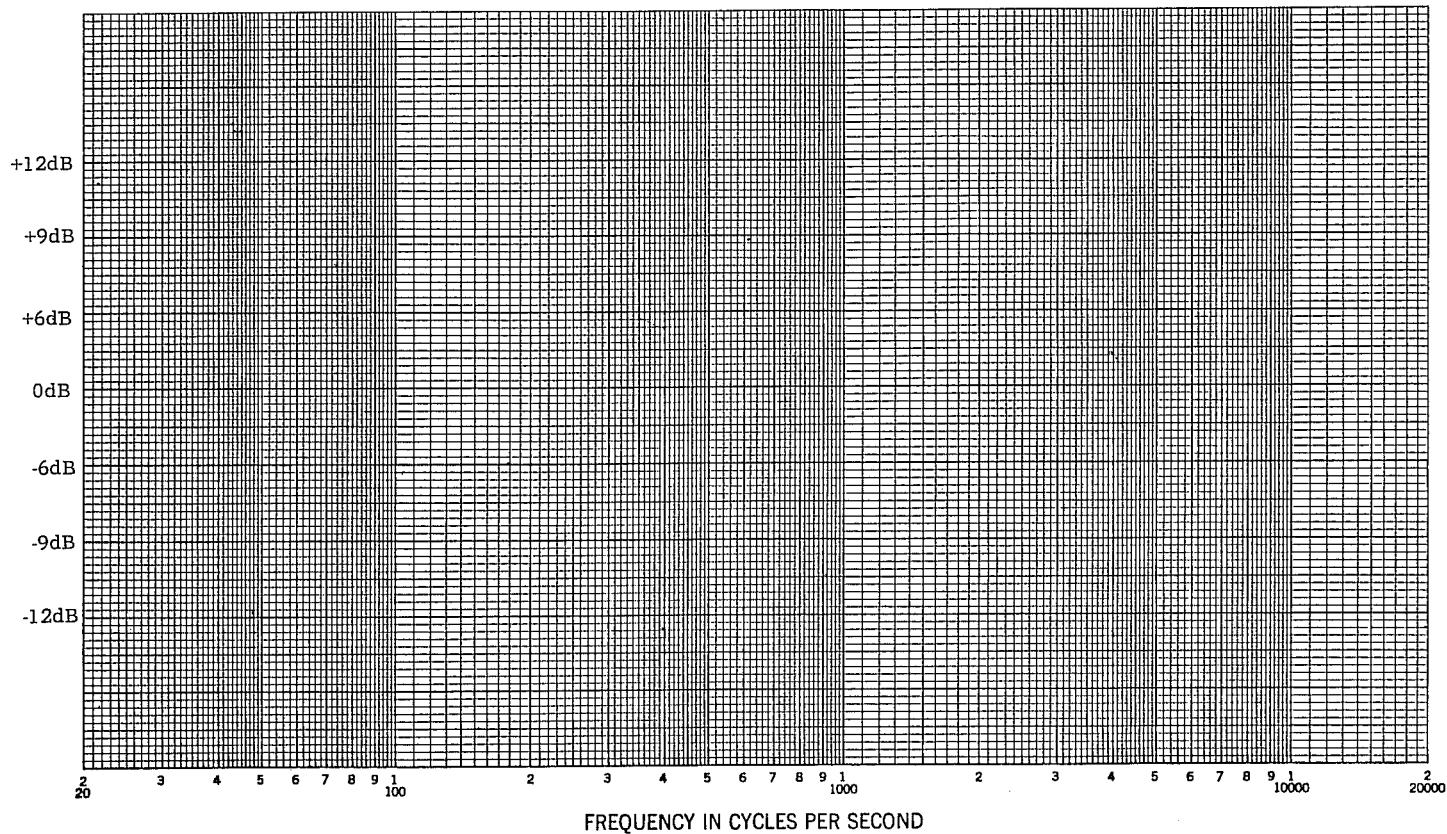
We're up here in our rainforest factory . help you.

If something doesn't work right or you want more information, just give our Customer Service department a call. Sorry, *no collect calls*, though.

Happy warbling and may you have many musical experiences with your D-11 and thoroughly enjoy the remarkable world of equalization.







## **INTRODUCTION TO THE AUDIO CONTROL CONDI- TIONAL WARRANTY.**

People are scared of warranties. Lots of fine print. Lots of non-cooperation. 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 are 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.

## **THE AUDIO CONTROL CONDITIONAL WARRANTY. LEGALESE SECTION.**

"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 it 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 D-10 or D-11. 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 D-10 or D-11 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 but someone, at our factory, nurse your ailing unit back to life. If anyone other than us 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 a toolcase, etc. The D-10 and D-11 are home hi-fi units, not bash-it-about utility equalizers, so if you bash one up, we can't be responsible.) , b) improper connection, patch the phono 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 too hot, wet, dirty, ect.

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 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 defect or warranty claim, express or implied, or damage to your system caused by hooking up the Audio Control D-10 or D-11.

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

## WHAT TO DO IF YOU NEED SERVICE.

Take it back to the store you bought it at. The Audio Control warranty for the D-10 & D-11 is an "Over-The-Counter" warranty. That means the dealer just gives you a new one. It's that simple. Then HE gets to hassle sending it back.

If you get any flack from the dealer after you've conformed to 1-4, call us and we'll have words with the dealer.

Unfortunately, you may have bought it mail order or moved to another city or the dealer disappeared one day into Chapter 11.

In that case, contact Audio Control. In writing at 6520 212th S.W., Lynnwood, Wa. 98036, (Attn: Service Department). Or by phone at (206) 775-8461.

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 been 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 *three* days.

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.)



# **AudioControl**

6520 212th S.W. In the Heart of the Northwest Rainforest, Lynnwood, WA 98036 (206) 775-8461