

# Tube Radios Mic'd Revamped



## General Information

This is the classic sound of tube radios, captured with microphones; and now 13 years after the original release, I've revamped this collection entirely. You can still use the 45 different effects (made from six radios) to get some 'vintage' tone with subtle to not-so-subtle filtering and some slight harmonic enhancement, with the newly added option of bypassing the filtering altogether leaving only the harmonic sweetening. Beyond that, you can now crank them into overdrive, and each one offers a wide variety of distortions you can use as a tool in your mixes!

There are three elements to these effects-

- 1) The frequency response of the fundamental part of the output. Each radio effect filters the audio in different ways and this contributes a lot to the overall 'old radio sound'. It reacts dynamically- the response often becomes fuller at higher input levels, and more filtered at lower levels.
- 2) Harmonic distortion, which also reacts to the input dynamically. Higher input means more tube harmonics. The harmonics also have their own frequency response, further contributing to the variety in these effects.
- 3) Compression. Higher input means more tube overdrive compression.

The first and second of those elements are combined into tone programs for each sampled effect, including a normal and 'hot' version (where you get the overdrive distortion). The compression is contained in a separate program. This means that to get the full sampled effect you need two Nebula instances, one tone and one compression instance. But this also also means you can use the compression separately if you'd like a little tube overdrive style soft-knee compression without any filtering or distortion. I've also added attack and release controls to those programs, allowing you to use them more like a typical compressor, opening up a huge range of possibility. They load with default settings to provide the type of instant compression/limiting you'd expect from tube overdrive.

All tone programs allow you to bypass the radio filtering part of the effect, and you can also turn off the harmonics for a cleaner sound, so you can use any of the three elements separately if you choose to do so! This also really opens up a lot of possibility! These programs can be made to provide distortion ranging from subtle fattening to growling or sizzling.

There are also some great skins by Max, which allow quick switching between all programs, for both N3 and N4!!!

## Background

For every program, the signal was captured from the radios through a microphone. I used six tube radios, mostly from the 1950s. For the 'tabletop' radios I just miked the built-in speakers, but the two 'tuners' don't have speakers, and were designed to be used with external speakers as part of a larger setup. For those I used a Yamaha HS80m, and a Bose system, as the speaker when sampling.

Two FM transmitters, the (not very good) HLLY TX-01S and the (very high quality) EDM TX LCD, were used to get the signal into the radios. This means that the signal going through the airwaves was part of the sampled chain! Another method used a simple hack where the signal was injected directly into the radio's wiring, bypassing the transmitter, airwaves, and demodulation by the radio, and providing a cleaner signal and an extended high frequency response that wouldn't normally be possible with the radio. Both methods were used when possible, to provide different results for each radio.

Radio tubes were often swapped out for alternate sets to provide different results between the various samples. There are also special '+' (plus) programs where I used either pre-emphasis EQ during sampling, or post processing of the samples, to get a fuller (less filtered) frequency response. Sometimes this post-processing was done in a very transparent way- applying amplitude envelopes directly to the recorded tone sweeps to accomplish the "equalizing". In other cases I simply EQ'd the impulses produced from the tone sweeps.

The stereo programs were made by pairing combinations of the other effects. Keep in mind that the other programs don't convert your stereo signal to a mono one. They just apply the same effect to both channels, whereas the stereo programs apply a separate effect to each.

## Installation

There are two main steps to the installation-

- 1) Install the programs/vectors. Just copy the .n2p files to your Nebula 'Programs' folder, and the .n2v files to the 'Vectors' folder. Before moving on to the skin install, check to see that the programs do load properly in default Nebula, by going into Nebula's program finder list and loading them from there. You'll find the programs in the 'RAD' category, then either the 'TR4', 'TR5', 'TR8', or 'TR9' categories below that, depending on the sample rate(s) you've installed. 'TR5' is for the 48khz rate.
- 2) To install the skins, consult the skin installation manual, the section relating to either N3 or N4, depending on which you're using! After installing the skins you will be loading these programs as a unique plug-in, not by using the Nebula program finder/list to select them! So don't ever load them that way again (it breaks the buttons in the skins)!

## General Use

- If you just want a **classic tube radio sound**, try out the normal programs. Each one filters the sound differently, and gives some harmonic saturation, which you can adjust with the 'Input Trim' and 'THD Level' controls. You can also add a compressor instance if you like.
- If you want some **subtle harmonic saturation without any filtering**, load a normal program and set the '*f* mode' knob to the '2' setting, which bypasses the radio filtering. This really opens the doors for using these programs as subtle saturation tools, and wasn't possible before the 'Revamped' update. You might find that certain programs produce harmonics that work really well for this purpose- try to remember them. Again you should use the Trim/THD Level controls to perfectly dial it in.
- If you want **overdrive harmonic distortion**, first add a compressor instance before the main tone instance, dial in some compression with 'Input Trim' (applying makeup gain as needed), then load a 'hot' program in the tone instance. They all sound different, so try several, and after loading them adjust the 'THD Mode' control through all possible settings (2-5). These produce different sounding distortions. Once you've found a combo you like, you can further refine the sound by adjusting Trim/THD levels (don't go over 0dBFS on the peak hold display), or by using the '*f* Mode' control to turn off the radio filtering ('2') or to remove the fundamental part of the signal completely ('0' setting).
- If you just want the **tube radio compression** part of the sound, load a compressor instance and play with the controls. Boosting 'Input Trim' gives more compression. Adjusting attack/release away from the default settings allows you to use these programs like a typical compressor.

## Main GUI



- 1) Button Matrix** - These buttons allow you to quickly select the various programs offered in this release. The gray buttons are the normal programs, and red ones are the 'hot' programs which give you heavy distortion. The '+' signs indicate a plus program with an enhanced frequency response, and the '+ +' buttons load double enhanced 'plus plus' programs.
- 2) Frequency Response Graph** - This window shows you the response for the fundamental element of the effect you've chosen, without the distortion factored in. If you choose a hot program the distortion takes over and the graph becomes less useful. Clicking this bypasses the effect entirely.
- 3) Input Trim** - An input drive control that compensates with the opposite amount of output adjustment. Boosting this will generate more harmonics.
- 4) THD Level** - Unlike boosting the input, this doesn't cause more harmonics to be generated. It's adjusts the output level of the harmonics after they've been generated. Very useful for precise fine-tuning of exactly how much distortion, or subtle harmonic enhancement you want in your signal.
- 5) f Mode** - Switches between three modes for the fundamental part of the effect. Default setting is '1' which gives you the sampled radio tone, usually with filtered low and high frequencies. '2' bypasses the radio filtering, outputting the dry input. Use this setting to get the subtle harmonics with the normal programs, or tube overdrive distortion from the 'hot' programs, but without the filtering. Setting this control to '0' can only be done in the 'hot' programs, and actually mutes the fundamental completely, allowing you to have only the distortion. If the distortion is really heavy you may not notice much difference in sound by switching to the different settings, but you usually do, and it can be interesting.

**6) THD Mode** - This one switches between various modes for the harmonic distortion content of the effect. Settings of '0' and '1' can only be used in the normal programs, while 2-5 can only be used in 'hot' programs. Normal programs default to '1' which gives you harmonics on the more subtle side, allowing slight enhancement/sweetening of the signal. Setting it to '0' turns the harmonics off completely, allowing you to get a clean output with only the radio filtering. 'THD mode' settings 2-5 are the overdrive modes. These modes give you overdrive distortion at high levels. Each setting sounds different, producing slightly or very different distortion profiles. Just load a 'hot' program and try them all out!

**7) Release** - Gives you some control over the dynamic behavior of the tone. It's not like the release on a compressor- it's affecting the tone, not the level. It's typically subtle and is set to provide a good result by default, so you can ignore it, but you may want to experiment with it when processing dynamic audio (like drums).

**8) Feedback** - In some cases it can give interesting results. Try it, but be careful (as with any feedback control)!

**9) Lo Cut** - Only works with the Admiral 4 and 5 programs. Very subtle with Admiral 4, less subtle with 5.

**10) Output Gain** - This is a simple output gain control. It can only boost by +6dB but lowers gain down to infinite (silence).

**11) VU Input Meter** - It's a VU style input meter. The separate little red LED above lights up if your output peak goes over 0dBFS.

**12) Peak Hold** - This readout shows your recent highest input level. Try to avoid going in over 0dBFS. The input trim control does affect this readout.

## Compressor GUI



- 1) Button Matrix** - Same as before. There aren't buttons representing every sampled effect for each radio, because not all of the captures had interesting dynamic responses. Some were almost perfectly linear. You don't even have to match the same radio if you're pairing one of these with a tone instance. You can mix and match as you please, or even use these without a tone instance.
- 2) Dynamic Response Graph** - This window shows you the non-linear dynamic response you're going to get. We can also call it the compression knee. Clicking this window bypasses the effect.
- 3) Input Trim** - An input drive control that compensates with the opposite amount of output adjustment. Boosting this will typically cause more compression.
- 4) Makeup** - Use this to boost the signal back up after compression. You can use the In and Out meters (9) to help you match the output with the input.
- 5) Attack** - I added this control to allow these programs to be used as simple soft-knee compressors in any situation, but it defaults to a fast setting giving instant gain reduction like you'd get with the radios.
- 6) Release** - Defaults to fast setting but can be adjusted for more control.
- 7) Output** - Can be used for up to 6dB of gain, or to lower the output.
- 8) Peak Hold** - This readout shows your recent highest input level. Try to avoid going in over 0dB. The input trim control does affect this readout.
- 9) Peak Input/Output Meters** - Here we have digital peak meters because I think that style is more useful in this case.

## Sampling Details

Here's some info on how the programs were sampled. 'DI' means 'direct input' = the signal was directly sent into the electronics (or used the Admiral's phono input), instead of being transmitted to the radio.

- Admiral 1** The signal was sent directly in through the 'phono in' for this capture.  
D/A > Admiral, DI > AT2020 mic > VTB1 > A/D
- Admiral 1+** Admiral 1 samples were EQ'd with a plugin for a fuller response.
- Admiral 2+** Some plugin pre-EQ was done before going into the radio.  
Chain: vst EQ > D/A > Admiral, DI > XM8500 mic > AT mixer > A/D
- Admiral 3** Again, the 'phono in' was used. D/A > Admiral, DI > ADM-6 mic > VTB1 > A/D
- Admiral 3+** Admiral 3 tone sweeps were enhanced with amplitude envelopes.
- Admiral 4** Has a Lo Cut control, sampled from the radio's tone knob. The effect is very subtle here. D/A > EDM trans > Admiral > AT2020 > VTB1 > A/D
- Admiral 5** This program also has an adjustable tone control, but it's less subtle.  
Chain: D/A > EDM trans > Admiral > XM8500 mic > A/D
- Arvin 1** Chain: D/A > EDM transmitter > Arvin > AT2020 mic > VTB1 > A/D
- Arvin 1+** Source: Arvin 1 tone sweeps were enhanced with amplitude envelopes.
- Arvin 1++** Arvin 1+ impulses were EQ'd with a plugin to be even fuller.
- Arvin 2** Here the Akai mic was ran through a cheap Audio Technica dj-style 2 channel mixer. D/A > EDM transmitter > Arvin > Akai ADM-6 mic > AT mixer > A/D
- Arvin 3** D/A > EDM transmitter > Arvin > XM8500 mic > VTB1 > A/D
- Arvin 3+** Arvin 3 tone sweeps were enhanced with amplitude envelopes.
- Bell 1** Chain: D/A > EDM > Bell > HS80M > Akai ADM-6 mic > A/D
- Bell 1+** Bell 1 impulses were EQ'd with a plugin.
- Bell 2** D/A > EDM > Bell > HS80M > XM8500 mic > VTB1 > A/D
- Bell 3** The Bell's original capacitors were replaced before this capture.  
Chain: D/A > EDM > Bell > HS80M > AT2020 mic > VTB1 > A/D
- Bell 3+** Bell 3 tone sweep samples were enhanced with amplitude envelopes.
- Bell 4** This time a Bose system was used as the speaker for the Bell.  
Chain: D/A > HLLY > Bell > Bose > AT2020 mic > VTB1 > A/D
- Bell 5** Again the Bose was used. D/A > HLLY > Bell > Bose > XM8500 mic > A/D
- Bell 6** Bell 5 tone sweep samples were 'resampled' through my Philco tube amp, using a tricky technique to produce slightly different results between left and right channels for a very subtle stereo effect. The treble control on the Philco amp was used to boost the high end.  
Chain: Bell Mic 5 recording sent out D/A to Philco amp, to A/D
- Heathkit 1** Chain: D/A > HLLY > Heathkit > HS80M > Akai ADM-6 mic > A/D
- Heathkit 1+** Heathkit 1 tone sweep samples were enhanced with amplitude envelopes.
- Heathkit 2** This time the bass cut filter on the HS80M was used, at 100hz.  
Chain: D/A > EDM > Heathkit > HS80M (w/cut at 100hz) > AT2020 mic > VTB1 > A/D
- Heathkit 3** Small amount of VTB1's tube-blend used.  
Chain: D/A > HLLY > Heathkit > HS80M > XM8500 mic > VTB1 > A/D
- Heathkit 3+** Heathkit 3 impulses were EQ'd to be fuller.
- Heathkit 4** The Heathkit was fed into the Admiral through its phono-in, and the Admiral's speaker was then mic'd. D/A > EDM > Heathkit > Admiral, DI > AT2020 mic > VTB1 > A/D
- Heathkit 5** Admiral was used as the Heathkit's speaker again, but this time some pre-EQ was used to neutralize the bass boost added by the Admiral.  
Chain: vst EQ > D/A > EDM > Heathkit > Admiral, DI > XM8500 mic > A/D



- Philco 1** This is an AM only radio, so the only method used to get the signal into it was the direct input method. Chain: D/A > Philco, direct in > Akai ADM-6 mic > A/D
- Philco 1** Philco 1 impulses were EQ'd to be fuller.
- Philco 2** Chain: D/A > Philco, direct in > XM8500 mic > VTB1 > A/D
- Philco 2+** Philco 2 tone sweeps were enhanced with amplitude envelopes.
- Philco 3** The signal was also injected into the radio at a different point than with the others. D/A > Philco, direct in > Akai ADM-6 mic > VTB1 > A/D
- Philco 4** D/A > Philco, DI > AT2020 mic > VTB1 (w/tube blend) > A/D > D/A
- Zenith 1** Used a replacement speaker in the radio (the original tore), that wasn't used with the others (they were sampled before the tear).  
D/A > HLLY transmitter > Zenith > XM8500 mic > VTB1 (w/tube blend) > A/D
- Zenith 1+** Zenith 1 tone sweeps were enhanced with amplitude envelopes.
- Zenith 1++** Zenith 1+ impulses were EQ'd to be even fuller.
- Zenith 2** This one used the original speaker and tube set of the Zenith radio.  
Chain: D/A > EDM transmitter > Zenith > AT2020 mic > VTB1 > A/D
- Zenith 3** D/A > EDM trans > Zenith > Akai ADM-6 mic > VTB1 > A/D

**The stereo programs** were made by pairing some of the previously described effects to others with similar frequency plots. Because of the differences between the channels, you may notice an increase in the stereo image of your input. There will also be phase differences so don't use these if that matters to you.

- Stereo 1** Here, Zenith 1 was used on the left side, and Zenith 3 for the right.
- Stereo 2** Heathkit 1 for left, Heathkit 3 for right.
- Stereo 3** Arvin 2 left, Philco 4 right.
- Stereo 4** Admiral 2 left, Bell 5 right.
- Stereo 5+** Arvin 3+ left, Zenith 1+ right.
- Stereo 6+** Bell 3+ left, Heath 1+ right.

## Tips/Ideas

- As mentioned elsewhere in this manual, setting 'f mode' to 2 bypasses the radio filtering. Setting 'THD Mode' to 0 bypasses the harmonics. Bypassing both at the same time bypasses everything and gives you no effect, which would be pointless, so don't do that.
- The feedback control can be interesting, so don't forget to try it out.
- Looking at the knee for each compressor program should give you an idea of what you're getting. One of them expands the signal, rather than compressing it.
- The release control in the tone programs tends to be subtle, and is more noticeable in the main (not 'hot') programs, when processing something like drums with lots of dynamics. You can then sometimes notice an effect on the radio filtering aspect of the sound.
- Usually it's best to have the compressor instance before the 'hot' program, if you're trying to get overdrive distortion. It allows you to reduce the dynamic range a bit before going into the hot program, which means the distortion is more consistent. However, if your input is already compressed or isn't very dynamic to begin with, you can skip the compressor instance, or try putting it after the hot program. Sometimes it sounds better that way.

Programs/effects and manual copyright 2011-2024 Tim Wisecup  
v3.0



Huge thanks to Max Ponomaryov, aka azzimov for the skins! Consider donating to his patreon account, which helps allow him to continue doing all the great graphical work (and other help) he's been doing with Nebula! <https://www.patreon.com/join/azzimov>