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## Rechipping results part 1

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**Ted Spencer** [Profil anzeigen](#) [Übersetzen in die Sprache: Deut:](#) [Weitere Optionen](#) 27 Aug. 2000, 09:00

In previous posts I've described my experiments with rechipping my Tascam M3500. Jim Williams (Audio Upgrades) recently refitted it with LT1358s which while they're \*very\* expensive (\$5 apiece bought in quantities of 100 or so), very "fast" high-end chips, I was not pleased with the results. I've now tried two alternatives - Burr Brown opa2604 (\$1.80) and opa2134 (\$1.20) which are reportedly very similar to opa2132s (about \$3). It's been fascinating.

Some impressions:

The LT1358s, while an improvement over the stock NM4538Ds, and arguably "uncolored" sounding, in use were very dry, shallow, and tight in the low end. The mids and highs were equally shallow and clinical sounding, making it extremely difficult to make mixes that had things like "life" and "air" and "juice". The original 4580s (22 cents apiece) were \*very\* loose in the low end, and had quite high distortion especially in the upper mids and highs, but could be whipped into sounding pretty good if you knew how to work with them. The Burr Brown 2134s I just auditioned for the first time today are surprisingly bright and "transistory" sounding. They have some of the depth and bottom end "life" that the 1358s lacked, but have an unacceptably harsh upper midrange, and much more mid and high end distortion than I expected, given my impression of the 2604s, which has been extremely positive. The 2604s have all the depth and bottom end liveliness that I missed in the 1358s, plus a sweet smooth top end and an impression of very low broadband distortion. They really sound very tube-like in the best possible way (euphonious, warm, clear, like \*good\* tube gear sounds) and I'm not surprised to hear that they're used in Manley and Millennia products. My only minor quibble is an impression of some slight upper bass "tubbiness" at times. This is a flaw I think I can work with. I'm planning to order enough of them to finish rechipping the entire console and I'll post again afterwards for those who might be interested in the final outcome.

Ted Spencer, NYC

"I'm a lot more like I used to be than I am" - James Taylor

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**Mark Plancke** [Profil anzeigen](#) [Übersetzen in die Sprache: Deut:](#) [Weitere Optionen](#) 27 Aug. 2000, 09:00

presto...@aol.com (Ted Spencer) wrote:

>given my  
>impression of the 2604s, which has been extremely positive. The 2604s have all  
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>outcome.

Ted

I've found much the same thing with the BB 2(604)'s, it actually sounds a bit compressed to my ears which isn't necessarily a bad thing. You may want to investigate putting something super clean

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in the monitor, output, bus & summing amps while using the 2604's in your channel modules to balance things out.

I did my Ward Beck entirely with 604/2604's and I'm now swapping in Analog Devices 176/275's in the master and bus sections which really seemed to open things and gave me a less tubby bottom end over the BB chips.

Mark Plancke  
SOUNDTECH RECORDING STUDIOS  
Windsor, Ontario, Canada  
<http://SoundTechRecording.com>

I don't know the secret of success, but the secret of failure is to try to please everybody. --Bill Cosby

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**Ted Spencer** [Profil anzeigen](#) [Übersetzen in die Sprache: Deut:](#) [Weitere Optionen](#) 28 Aug. 2000, 02:43

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>Analog Devices 176/275's in the master and bus sections which really  
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>Mark Plancke

This has crossed my mind. In fact I have considered leaving the LT1358s in the master and buss sections. That combination, which I now effectively have on the 5 input modules with 2604 refits, sounds pretty darn good. I've wondered if an all 2604 scheme might get too tubby. I experimented with double patching today through 2 (actually 4 for stereo) modules of 2604 equipped inputs to see if the tubbiness got noticeably worse and it didn't seem to. The harsh transistoriness of the supposedly good sounding 2134s concerns me however. I certainly don't want to use those in the master section. I've heard great things about the 2132 series but now I wonder if they might have some of the same nastiness. Have you found the AD 176/275s to be as smooth sounding as the 2604s? I'd be curious to know how they sound in themselves.

Ted Spencer, NYC

"I'm a lot more like I used to be than I am" - James Taylor

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**jim turner** [Profil anzeigen](#) [Übersetzen in die Sprache: Deutsch](#) [Weitere Optionen](#) 28 Aug. 2000, 09:00

I re chipped a older Trident board not too long ago.

One thing I quickly learned is that with newer "high bandwidth" chips you do have to make some modifications to the circuit.

1st is to bypass the supply rails [on each chip] as close to the IC pins as possible, depending on the type and age of your board it can be a challenge, but always possible with a lot of patience and 100's of "high quality" .1uf caps and make a clean ground path for them if possible.

Older chips were not as sensitive to high freq. decoupling as new high speed devices are.

2nd thing to look out for is that these newer chips can be more sensitive to capacitance on there output than lower bandwidth types.

The OPA604's need a 100 ohm resistor in series on their output or else they can oscillate way up in the high meg. region.

This all depends on the capacitance load on the output.

Also, some newer chips use more current than your old ones, so you might have to beef up your power supply.

I rebuilt my whole PS with a high current low impedance regulator design, which will also improve your dynamics drastically.

I tried the 604's and find them very clean to sterile sounding, I will use them in the front stage or stages sometimes with good results.

What I found to be the best sounding all around chip [for my tastes] is the AD711 series.

These chips have awesome tone and lots of punch.

I use them in the later and some final stages.

They however need a 470 ohm resistor on their outs if there is over 3 feet of cable or more behind them, such as the DI out's on your board.

The best way to test out a re chip project is to work only with one channel and beef up the rail caps and electrolytic's with high quality items such as Panasonic's HSF series electro's and V series stacked film .1's.

then try using 711's or whatever you wish to try on that channel and put a scope on the output of your board to see if there is any high freq oscillations and then see how that MOD sounds against your stock channels.

If your board can handle 711's I think you would be pleased with the rich tone.

But to do it all right it is a huge project, but well worth it.

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**Mark Plancke** [Profil anzeigen](#) [Übersetzen in die Sprache: Deut](#) [Weitere Optionen](#) 28 Aug. 2000, 09:00

- Zitierten Text anzeigen -

Ted

Yes, the AD's sound very smooth and punchy, a tad drier sounding than the BB's because of the lack of artifacts that the BB's introduce.

They also run very quiet, which is why I like them in the summing and master sections and draw very little idle current (5ma). I just redid my JH24 with these chips and it really made a big difference.

The BB's tend to oscillate (Dan Kennedy calls them "snakey") unless they have really good p/s decoupling which my Ward Beck has. Make sure you check em on the scope before you commit to doing your whole board.

My suggestion is to do your channel strips first and live with it for a while before messing with the upgraded master sections.

Mark

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**Rick Krizman** [Profil anzeigen](#) [Übersetzen in die Sprache: Deut](#) [Weitere Optionen](#) 28 Aug. 2000, 09:00

Ted Spencer wrote:

> In previous posts I've described my experiments with rechipping my Tascam  
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> two alternatives - Burr Brown opa2604 (\$1.80) and opa2134 (\$1.20) which are  
> reportedly very similar to opa2132s (about \$3). It's been fascinating.

> Some impressions:

> The LT1358s, while an improvement over the stock NM4538Ds, and arguably  
> "uncolored" sounding, in use were very dry, shallow, and tight in the low end.  
> The mids and highs were equally shallow and clinical sounding, making it  
> extremely difficult to make mixes that had things like "life" and "air" and  
> "juice".

Ted,

I had a similar experience with my Trident 24. Jim upchipped 8 of the input modules and the stereo master with the LT's and I've had mixed feelings. Lots of clarity and air, but I think there's some sort of 2k boost in there that sounds a little harsh. OTOH, it can be argued that the heightened transparency of the master module makes other irregularities upstream even more obvious. In any case, I'd like to try a few more things. Is it a simple matter to just pop in the Burr Browns, or does it require other alterations in the circuit to maximize their effectiveness?

Anyhow, your experiences are very interesting. Please keep us posted.

Rick Krizman  
Krizmanic Music

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**Ted Spencer** [Profil anzeigen](#) [Übersetzen in die Sprache: Deut:](#) [Weitere Optionen](#) 28 Aug. 2000, 09:00

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>sounds a  
>little harsh. OTOH, it can be argued that the heightened transparency of the  
>master module makes other irregularities upstream even more obvious.

I went through a similar thought process. Initially the improved clarity was very exciting in bench-test mode. Then I started mixing projects. "Very unforgiving" was how I began to think of the new electronics. In other words if the raw tracks sounded really good then all was cool. But the console wasn't helping me at all to shape weaker tracks into sounding cooler. This is what I meant by missing the "juice". Like when you eq and compress, sometimes heavily, to color an instrument or voice - to sort of "rev it up". Well, these LT chips just don't like to rev. The overall results were always "hard" sounding. Of particular note: tight tight tight bass sounds. I could \*not\* get most bass tracks to "sing". The notes would seem to choke off and die rather than sustain in a satisfying way. I think this is because of the ultra high slew rate. I think slower chips may actually contribute to the sustain of a bass, which most of us are accustomed to, and like. I tried every outboard trick I could throw at it but still no juice. Ultimately I had to use the Waves "Maxx Bass" plug in in mastering to get any bass oomph at all. This had been really causing me to sweat bullets during the mix. In my recent listening tests with the BB2604s I noticed this choking effect was gone.

Also of note with the LTs: a dramatically shrunken soundstage depth-wise. This factor alone caused great listening fatigue - I just couldn't get any 3 dimensionality from the sound at all. As I mentally tried to "reach in" to the mix and move things around front-to-back, the console just wouldn't let me. Everything was right on the surface making mixing decisions much harder because \*everything\* had to share the "front row". Argggh. Again, upon a/b'ing with the 2604s the depth was immediately, dramatically back. These are \*really\* cool sounding chips.

In any

>case,  
>I'd like to try a few more things. Is it a simple matter to just pop in the  
>Burr  
>Browns, or does it require other alterations in the circuit to maximize their  
>effectiveness?

So far I've just popped 'em in and they work great. I did call Jim and ask him about directly replacing them and he actually warned me against using 2604s because of concerns about oscillation. Others have also expressed this concern, although Monte McGuire and others have seemed to think they should work ok. So I tried them and love the results so far. I'll probably go ahead and rechip all of the input modules and see how it goes unless bigger brains convince me not to. Jim did say that BB 2132s should work fine but the only ones presently

available are the \$6 apiece high-test versions. I might go ahead and try enough to cover the master section. Right now the 2604s aren't available for a week or so so I have a little time to do further research before plunking down the \$250 for the remaining inputs.

Ted Spencer, NYC

"I'm a lot more like I used to be than I am" - James Taylor

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**IV Mahn** [Profil anzeigen](#) [Übersetzen in die Sprache: Deutsch](#) [Weitere Optionen](#) 29 Aug. 2000, 03:14

On 27 Aug 2000 19:43:22 GMT, presto...@aol.com (Ted Spencer) wrote:

>In previous posts I've described my experiments with rechipping my Tascam  
>M3500. Jim Williams (Audio Upgrades) recently refitted it with LT1358s which  
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>two alternatives - Burr Brown opa2604 (\$1.80) and opa2134 (\$1.20) which are  
>reportedly very similar to opa2132s (about \$3). It's been fascinating.

(snip)

This really interesting. Thanks for the post. Can you explain more about what in the original sound of the board you were trying to improve/fix (didn't like) so that can be used for a point of reference?

Adios,  
IV

"...anyone seen houdini around here?"

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**Rick Spieren** [Profil anzeigen](#) [Übersetzen in die Sprache: Deutsch](#) [Weitere Optionen](#) 29 Aug. 2000, 09:00

> Can you explain more  
Ted Spencer wrote:

>absolutely the original (Audio of the board) also redesigned parts of the  
>improvements (like the pots) he selected point of necessary or deleterious and  
>adding some additional very high quality caps and other parts. Among other  
>things, this redesign shifted the eq's shelving center frequencies up from 10K  
>to 12K and down from 100K to 80K and moved the upper sweep mid eq's top freq to  
>20k from 11k. I like these parts of the mod.

"The original 4580s (22 cents apiece) were \*very\* loose in the low  
end and had quite high distortion especially in the upper mid and high ends.  
It's nice you can use lots of things and if you know how to work with them."

wondering if some of the circuit redesign was to accommodate the LT and  
whether it's possible to just pop in BPs without any additional modification, but  
circuit removing a few components he deemed unnecessary or deleterious and  
adding some additional very high quality caps and other parts. Among other

things I think he says of these eq's shelving center frequencies were  
to 12K and down from 100K to 80K and moved the upper sweep mid eq's top freq to  
20k from 11k. I like these parts of the mod.

I'd also like to say to those who are following this thread that while I  
disagree with any of the choices of opamps in his mods, I think he's a great guy and  
does very fine work. I really don't think he can be faulted for choosing what  
Rick Kirks is the best opamp under the circumstances. The LT chips he uses are  
KrazyMax and Jim's prices are \*very\* reasonable. He's also completely  
reliable, delivering the work as promised on time. Examination of his handiwork  
shows excellent attention to detail. I'm planning to send some other pieces to  
him for modify. However...I just might suggest some alternative opamps <g>

**Ted Spencer NYC** [Profil anzeigen](#) [Übersetzen in die Sprache: Deutsch](#) [Weitere Optionen](#) 29 Aug. 2000, 09:00

Ted  
"I'm a lot more like I used to be than I am" - James Taylor

I replaced the chips in my Soundcraft and my Otari with AD OP275 and I  
was extremely pleased. I tried the BB2604s and didn't care for them. I

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can't really characterize the difference in words (I am a bass player, after all) but I was very happy with the ADs.

Best wishes,

Seth Glassman

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**Monte P McGuire** [Profil anzeigen](#) [Übersetzen in die Sprache: Weitere Optionen](#) 30 Aug. 2000, 05:42

In article <20000827154322.22508.00000...@ng-md1.aol.com>,

Ted Spencer <presto...@aol.com> wrote:

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>Some impressions:

Thanks for posting this, BTW.

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>arguably "uncolored" sounding, in use were very dry, shallow, and  
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>had things like "life" and "air" and "juice".

Interesting...

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>and had quite high distortion especially in the upper mids and highs,  
>but could be whipped into sounding pretty good if you knew how to work  
>with them.

Also interesting...

>The Burr Brown 2134s I just auditioned for the first time today are  
>surprisingly bright and "transistory" sounding. They have some of the  
>depth and bottom end "life" that the 1358s lacked, but have an  
>unacceptably harsh upper midrange, and much more mid and high end  
>distortion than I expected, given my impression of the 2604s, which  
>has been extremely positive.

This is very interesting, given that the numeric performance differences are somewhat small between the 2604/2132 and the 2134! But, these differences are all in the high frequencies, and the 2134 should be more brittle, and that lines up with your observations. Maybe it matters more when you have a number of them in series...

(Isn't it funny that BB positions these as the 'audio' version of this family, when it's possible that they sound worse than the 2132 and 2604!)

>The 2604s have all the depth and bottom end liveliness that I missed  
>in the 1358s, plus a sweet smooth top end and an impression of very  
>low broadband distortion. They really sound very tube-like in the best  
>possible way (euphonious, warm, clear, like \*good\* tube gear sounds)  
>and I'm not surprised to hear that they're used in Manley and  
>Millennia products.

Yes, they are very clean and fun at the same time. These two things are not mutually exclusive... in fact, an amp that sounds clinical is usually not that accurate at all. The specs are certainly worse for the LT1358.

>My only minor quibble is an impression of some slight upper bass  
>"tubbiness" at times. This is a flaw I think I can work with. I'm

>planning to order enough of them to finish rechipping the entire  
>console and I'll post again afterwards for those who might be  
>interested in the final outcome.

If there is a difference between the 2132 and the 2604, the 2132 might err less on the tubby side. But, I would not go so far as to say that it's more clinical or any less fun than the 2604. But, then again, I haven't heard a whole lot of them in series, I've been using only one or two for preamps and a pretty minimal monitor section on my Neotek.

The one thing that always annoyed me with the 2604 is that it needs time to warm up before it sounds good, and that mean that there's some sort of thermal thing related to sound quality. My concern is that if you make the amp drive anything slightly difficult, this will cause the temperature of the chip to change and perhaps make it sound worse.

Traditionally, amps with this sort of problem could be identified since they have a slight rise in distortion with low frequency signals. I have not looked for this, but it could explain why the 2604 sounds more tubby (if indeed it does) than the 2132. I personally can't tell, again, because I'm not using that many in series.

I say get a handful of 2132 and see what they do in a channel. Remember, if you buy the non exotic grade from Insight Electronics or another BB dealer in bulk, they're not expensive at all, basically around the same price as the 2604.

Thanks for the post, and best of luck!

Monte McGuire  
mcgu...@world.std.com

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