

Borbely-Clow Super Buffer

This preamp project gives you many options for recording various formats.

Over the years (well, by now, over the decades), I've accumulated many recorded formats and an equal number of playback devices. These days everything ends up on CDR, and I have an excellent burner, the HHb 850. As a result, I'm something of a magnet for anyone with an older format recording wanting to get his/her musical history onto the current CD format.

This all came into solid focus during a CD production of the Smoke Blues Band, a local group from the 70s. This nostalgia project required collecting material from cassette, 2-track master reel-to-reel, standard 4-track reel-to-reel, and even an old reel from a 1&7/8 machine. I spent a lot of time swapping cables back and forth in a system that did not have a sufficient preamp to accommodate all the devices.

IN SEARCH OF THE HOLY PREAMP GRAIL

Most studios solve this cable swap problem with a patch panel. However, I had acquired an old Macintosh 2205 amplifier that played great (love those output transformers!). So I needed some sort of buffer for the digital devices playing through the amp as well as a way to connect a lot of playback and recording machines together.

I first examined several op-amp designs for a preamp. There were good ideas there, but an *audioXpress* article (5/02) by Erno Borbely caught my eye. As he described his development of an

all-FET line amp, he mentioned an intermediate step that produced what he called a "Super Buffer." The topology looked straightforward, reasonably simple, and compact, and he offered a kit of parts (EB-602/403) on his Web page (www.borbely.com). So I ordered the kit and received it within a week, shipped from Germany.

SPARE PARTS, SURPLUS FINDS, AND PROJECTS NEVER COMPLETED

Now that I had decided on the active part of the preamp, I needed switches, power supplies, cabling, and a few whiz-bang features. I acquired a couple of 8-position, two-pole Grayhill switches from a local surplus store that also provided 4-pair phono panels



PHOTO 1: Front view of the Borbely-Clow Superbuffer 2003.

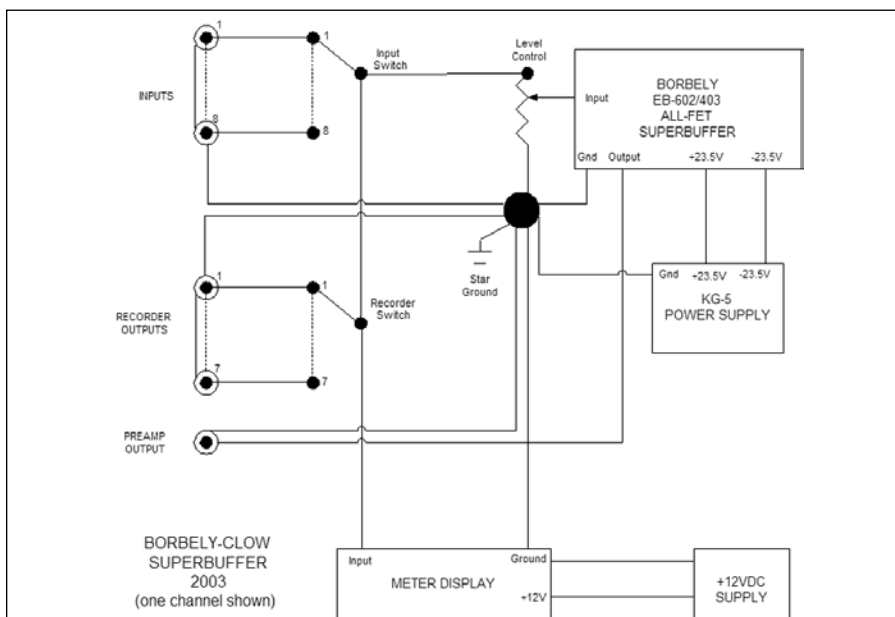


FIGURE 1: Block diagram (one channel shown).

ABOUT THE Author

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originally designed for circuit board mount but also with screw connections for panel mount.

I already possessed an Alps volume control that I had ordered long ago from Old Colony. A bunch of raw Mogami audio cable was available for signal connections. I examined a power supply, also purchased years ago from Old Colony, designed by Gary Galo and Walt Jung in *Audio Amateur* (4/90). The only component I needed to purchase was a rack-mount chassis, which I obtained from Sescom.

For a whiz-bang feature, I decided to adapt a Velleman LED VU meter kit to the preamp. My HHb 850 has LED meters active during playback. I've noticed that most modern CDs have very little dynamic range; some rock CDs show as little as 3dB for most of the songs! No wonder people complain about CD sound.

Once in the digital domain, engineers can do anything to the music, and I'm actually amazed that some of these super-compressed productions sound as well as they do. Anyway, I wanted some way to monitor the dynamic range of recordings with the preamp, thus the addition of the Velleman VU meter.

LITTLE PLASTIC BAGS AND BEEFY TOROIDS

The Borbely super buffer kit arrived containing a zillion little plastic bags, one for each component value or part number! Well, it did speed assembly. Everything went together smoothly, although there were a couple differences from the original article. However, the supplied kit documentation included an updated schematic as well as a setup procedure for the completed kit. My only complaint was the lack of 6dB gain resistors with the kit. Thankfully, I had some available.

The power supply was designed for $\pm 15V$ DC but I needed $\pm 24V$ DC for the super buffer. Borbely supplies an excellent, but somewhat exotic, power supply for the super buffer; however, it is quite expensive, and I had the Galo/ Jung supply waiting for an application. The Avel-Lindberg toroidal transformer was hefty enough to supply sufficient rectified voltage so

I could modify the regulators for a higher output to the preamp. With a little resistor swapping, I was able to get about $\pm 23.5V$ DC for the super buffer.

WIRING MADNESS

I guess I could have saved some interior space and some hassle using simple hookup wire, but I had all this cool Mogami around, so I used it for all the input and output connections. The feed to the output switch was taken before the volume control. I used a switch for the outputs to avoid several simultaneously connected recorders loading the signal. One position on the switch was left open (null) for those pure listening occasions.

The grounds from the input/output connector panels, power supply, and super buffer board were taken to

a single star ground. I also stripped a wall wart for the VU meter 12V DC supply (switched, for those times when I'm tired of flashing lights).

The Alps volume control is 100k. Borbely recommended 20k, but the larger value doesn't seem to cause any problems.

HEAVY METAL HACKING

The most difficult part of this project was the drilling and cutting for the connector panels and the VU meter display.

But with a little patience and fortitude (and powerful drills, saws, and large files), the operation was completed. Everything ended

up mounting rather nicely. The chassis itself was a bit of a puzzle; instructions were not supplied. But I did finally figure out the system. One



PHOTO 2: Back view of the unit.

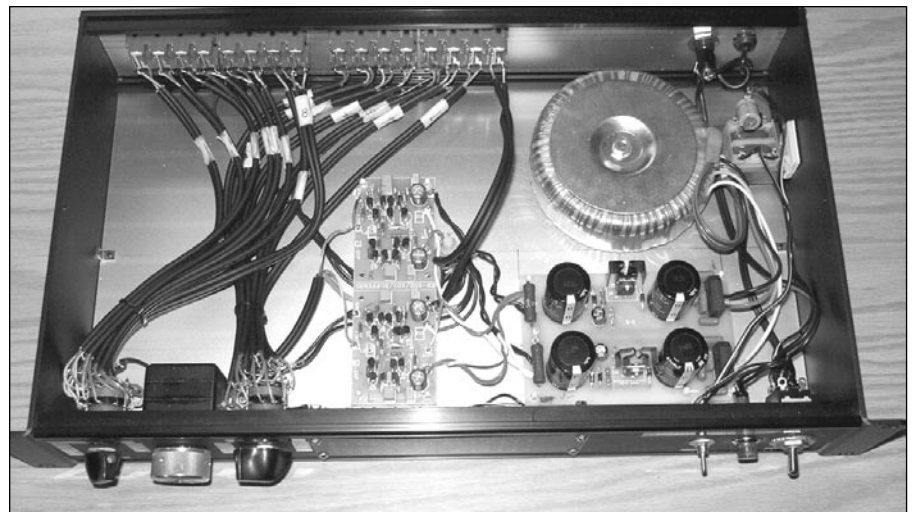


PHOTO 3: Overhead view of the device.

complaint was the insufficient screws supplied by Sescom³one more bag, please!

I used a Brother P-Touch printer and computer software for labeling. I used white-on-clear tape, which provided a decent look to the front panel.

LISTENING TO THE ANGELS SING

Of course, the best part of this type of project is listening to the final product. And this super buffer does sound gorgeous! Very detailed, particularly on those CDs produced with sound quality in mind (Audioquest, Mapleshade, and so forth). I do a lot of live recording. This preamp gives me the chance to delve deeper into my recordings, listening for those things that tell me what I did right and what I need to improve.

And, as I hook up more equipment to the preamp, there is less hassle swapping wires around. The switches feel solid and have (nearly!) enough positions to accommodate the equipment I wish to use.

GILDING THE LILY

There's always room for improvement. Purists will demand a higher quality volume control and better switches. The I/O panels could be improved (at a much greater cost!). However, this preamp is already indicating deficiencies in other parts of my system, so I don't need to improve parts quality at this time.

One feature I neglected in the original design is some sort of monitor switch so I can compare the signal source and the output of the recording equipment. This switch is at the top of the list of future mods and will involve the input of the CDR, the most used recording device.

THANKS AND CREDITS

A big thanks to Erno Borbely for his JFET designs and kits. And thanks to Old Colony for supplying significant kits and parts. I just wish they would bring back some of the old favorites (at least a circuit board for the Galo/Jung power supply). Also thanks to Raelco, a parts hound's heaven. *aX*