

# DST ENGINEERING

*Jeff Swanson and Bob Dettorre founded DST Engineering just two years ago after originally becoming acquainted playing together in a band. In addition to building DST amps, both remain avid musicians, and we first became aware of Jeff's skilled cabinet building when we introduced the Balls 18M amplifiers built by Danny Gork in these pages. Jeff has built every Balls cabinet ever produced, as well as cabs for GDS Amplifiers, Clark, and others. We asked Bob and Jeff to explain how DST began:*

**Bob:** I built my first guitar amp with my father when I was 13, not long after I got my first electric guitar. He was a TV and stereo repair tech at the time and we always had lots of



old Hi-Fi and PA amps lying around. I got my first exposure to tube electronics and my interest in the art from him. I remember going on service calls back in the day when TV's and

stereos were huge pieces of furniture and repairs were done in the home (usually by just replacing tubes). Through my high school years I played in bands and fixed everyone else's amps to help fund my own. and I eventually went to college and got degrees in electrical engineering. After too many years of the corporate-industrial thing, I let Jeff talk me into doing DST Engineering. That was two years ago.

**Jeff:** I remember borrowing amplifiers in the late '60s during my initial garage band days. There was the time when we all plugged into a 1x12 Sears Silvertone amplifier – two guitars, bass and one mic. As with Bob, I could not afford an amplifier and speaker cabinet (I'm a big piggyback guy), so after seeing what a fellow musician had built, making a speaker cabinet seemed fairly straightforward. A few measurements, a few cuts, nails, glue and paint, put in a Radio Shack 15" speaker and there you go. How did it sound? Well, to a 12-year-old bass player it was great! As for my amplifier experience, during the time I lived on the road doing the bar circuit I couldn't afford an amp tech. Our band, The Buzz Brothers, did our own maintenance. Thank goodness we didn't kill ourselves considering the voltages carried by the late '60s Marshall, Ampeg V4, V4B's and SVT's.

**TQR:** What were some of your favorite vintage amp designs, and why?

**Bob:** I've always had a soft spot for some of the great American "muscle car" amps of the '70s. My first commercial amp was a Sunn Sonaro bass amp that I hot-rodged for guitar. Then came the Plush through the Sunn 2x15 cabinet (anyone remember Plush?) the West, and a string of Ampeg V2 and V4's. These were great amps – big, heavy and very loud. The best part was that a lot of guys were afraid to work on them, and for someone willing to just dive in like I was, it was a constant source of income doing repairs and mods.

**Jeff:** Here is where Bob and I share common ground because we are both lovers of old Ampeg amplifiers. When we started playing together and spending a lot of time figuring out playing styles, favorite bands, songs, guitar, bass and drum tones,



the big connection was the ability for an amplifier to produce what your mind, pick,

fingers and string attack were giving it. We are not big fans of high gain, easily-overdriven tone, but we do like loud. Bob is a master at bringing out the dynamics in an amplifier more than any I have ever played. This goes right back to the ability of the amplifier to deliver the note – strong, clean, articulate and with crunch! As I said, we liked the late '60s and early '70s Ampeg amps and their ability to deliver, but they lacked crunch, and we like to be able to dial that in with the volume control on the guitar at just the right moment.

**TQR:** When did your involvement in the 18W craze and Balls amplifiers begin?

**Bob:** I was never interested in the old 18-watt amps, but I let Jeff drag me into it when he got the bug to build one of them. He had a few problems and did not like the way the old Marshall design handled the low end and went into overdrive almost immediately. So we spent a few long nights at my bench making the amp work right and started the modifications that would eventually become the DST MarWatt. At that time I had just finished building an EL34 based 20-watt amp of my own design from scrap parts. It was more of a mini version of a 50-watt Marshall than an 18-watt type amp, although it weighs about the same as the 50 watters do. We had so much fun that it really got me re-thinking my career choice and reminded me that I went to college specifically to learn audio design.

**Jeff:** The one thing I can do is come up with lots of ideas for

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amplifiers. As for my relationship with Danny Gork from Balls amps, we hooked up early on in the 18-watt amplifier craze to provide his cabinets and even answer a few questions from Bob on

the technical side. Since the beginning of Balls Amplifiers I've built every cabinet they have delivered and continue to do that from the Swanson Cabinets side of the house.

**TQR:** Describe the various models you build and how they have resembled or offered significant departures from specific, well-known vintage models of the past.

**Bob:** We have the U88 and U88B, the Marwatt and DST-18, the UV6, U34-CL, VTR2 Reverb and the new U84-CL, as well as a ton of cabinet designs. And of course, the Amp-Cradle, and the new 150 watt CrossBow is well under way, and also a low power, 5-7 watt amp.

**Jeff:** After the MarWatt was finished I started to work Bob over on what I really had in mind. I'm a huge fan of the Who and Cream and two tones that have always hit me are on "Young Man Blues" and "Crossroads." The style of playing could not be farther apart. Enter HiWatt and Marshall. I think my love of Amps helped lead me to HiWatts – lots of headroom, headroom, *headroom* and then CRUNCH! Hits you like a tone of bricks right in the gut. Pete did not need to play lead with all the other action coming from the rhythm section – his power cords came through loud and clear. Eric was in a constant lead battle with Jack and Ginger, which is what drove Cream to the height of the music world and no doubt to their destruction. He was smooth, and leads just flowed out like cream. I wanted to nail both tones in a single box with the ability to blend them together and jump back and forth. And one more thing... it couldn't be a clone of either amplifier. You can hear clips of the amplifiers via our website at [www.dst-engineering.com](http://www.dst-engineering.com) and both the UV6 and U84-CL are heavily featured on a new CD from the Mambo Sons, Racket Of Three. Tom Guerra is a great guitarist and clips of the amplifiers and the CD can be heard at [www.mambosons.com](http://www.mambosons.com)

**TQR:** What was the process involved in determining the type of speakers that would ship in your amps?

**Bob:** Listen, speakers make such a huge difference in the sound and feel of an amp. We're constantly trying new speakers and combinations in different cabinets, looking for the



perfect combination to suit each particular model. We have our custom made Fanes, Celestion, Weber, Eminence and even some old EV speakers in-house. We also have a good assortment of

guitars and pickups to test with. The quest never ends – not to mention the fact that there is a dizzying selection available these days.

**TQR:** How are your cabinets constructed, what types of wood do you use, and why?

**Jeff:** Our cabinets are almost always made from Baltic Birch plywood. I use 3/8, 1/2, 5/8 and 3/4 inch thickness depending on the size of the cabinet and the size of the amplifier. Most of my cabinets are a 1/2 inch shell, because I like a lively cabinet that moves a bit with the sound waves coming off the speakers themselves. All corners are dovetail joints, all bracing is set into a dado cut and the glue is moisture resistant.

I've also built hardwood cabinets in maple, black walnut, cherry, oak, purple heart, mahogany and of course, pine. The big reason I use Baltic birch is its stability over time. A lot of



the restorations I've done reveal just how much wood will swell, shrink and warp over time.

Thirteen layers of plywood will remain stable and the dovetail joints won't come apart. And

you can't argue with the success of Jim Marshall and his 4X 12 speaker cabinets made from Baltic birch since 1962.

**TQR:** How do you describe the sound of your amplifiers, and from a builder's perspective, what enables them to sound the way they do?

**Bob:** The most difficult thing has been coming up with a really great tone that we can call our own. Even though all those great '60s and '70s amps influence us – British and American

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– we're pretty happy that we've come up with our own tone and feel. Our customers often tell us that our amps have lots of tonal variety and plenty of attitude. One of the best compliments has been that

many players who like reverb in their amps don't miss it in our designs.

**Jeff:** A couple of major points for us were to have a volume knob that gives a smooth dB increase as you turn it clockwise. The amplifier needs to deliver tone all the way through the turn, not hit it in one spot and hope that the house engineer or recording engineer is not looking at you with a big thumbs down. This is not about just finding the right potentiometer for the control – it starts with the speaker characteristics, the output tube characteristics, the type of pre-amp tubes being used, the amount of loss in the tone stack, the type of phase inverter and both transformers. Each of these areas have to interact, and from the very beginning of the design you have to know what the cause and effect is for each component in the circuit. The ability to deliver a wide dynamic range at low volumes to give a rich full sound and then turn it up without specific frequencies taking over takes both engineering knowledge and experience actually playing music. **TO**

## REVIEW DST ENGINEERING'S UV6 AMPLIFIER

As we pulled the DST UV6 out of the box, our first reaction was, "Damn, this is big!" And it is. At 28 x 22 x 10.5 it's wider and deeper than the average combo, and big amps definitely have their advantages. Of course, big amps (and we're really referring to cabinet dimensions) aren't new... The vintage Fender Dual Showman loaded with dual JBL D130 15's was one of the first really big amps, and the 100W Marshall Super Lead dual 4x12 slant and straight front cabinets certainly reset the bar for "big." And what all of these have in common is a very big sound. We suspect this is precisely what was cooking in Jeff Swanson's mind when he designed



the roomy cabinet for the UV6, which is loaded with a pair of Celestion G12H 70th Anniversary speakers.

The 2x12 UV6 is cathode biased, enabling it to be

operated with dual 6V6's, 6L6's, 5881's, EL34's or KT66 output tubes, and an optional EL84 version is also available. Our review amp was shipped with 6V6's, and we generally preferred their sound over the 6L6's and EL34's we tried, which is not to suggest that the amp sounds bad with other tubes – we simply preferred the richly detailed tone of the 6V6's. Features of the UV6 include Hi (maximum gain) and Lo (-6dB) inputs, a Gain control that adjusts gain from the pre-amp stage, a treble/bass/boost/cut Contour control, Output (volume), Bass, Middle and Treble tone controls, and a footswitchable Boost control that increases gain at the output stage by up to +9 dB. The impedance of the speaker load can be set at 4, 8 or 16 ohms.



We played a wide variety of guitars and pickups during our evaluation of the UV6, and it matched up very well with them all. Headroom is highest with

single coils, and the UV6 captures the character of classic Marshall and Vox tones ranging from moderately clean at modest volume settings to variable, full-out distortion loaded with harmonic overtones and a throaty growl. The Boost control progressively fattens up the tone, while the Gain control adds raunchy grit and sustain by degrees. The overall tone at all settings is warmer, more detailed and multi-dimensional than typical vintage British amps, and the tone controls produce a wider range of tone-shaping colors. The Contour control, in particular, provides a very useful means of precisely shaping EQ to optimize the sound of different pickups.

The UV6 is an excellent example of the current state-of-the-art in handcrafted, small-production amps. It is a comparatively large and rather hefty 2x12 combo, and again – that's not a bad thing – but if you are unable to comfortably handle a wide 62-pounder, you may wish to consider the smaller cabinet option at 27 x 20 x 10. You may lose a tiny bit of low-end, but the UV6 has plenty to spare.

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This amp doesn't produce a lot of clean headroom at average stage volumes, although using 6L6's with single coils will increase it. The clean tones are not what we

would describe as Fender-like, but more British and complex in character. The strength of the UV6 is its great presence, wide frequency response and variable gain and distortion features at sensible volume levels. If you want a dual personality amp with big, wide Fender clean tones plus British harmonic content and crunchy good thang, consult with Bob & Jeff. The beauty of working with a custom builder is that personal preferences can be explored and reflected in tweaks to the finished product. With those qualifiers in mind (and perhaps an extra 4 feet of AC cord on the UV6), we invite you to join players like Billy F Gibbons and check out a DST. You can work with the builders, and the builders will work with you. And that's a great way to build (or buy) an amp... **To**

[www.dst-engineering.com](http://www.dst-engineering.com), 1-508-364-9578

## Epiphone Wildkat

MAKING THE WILDKAT WAIL with DAN ERLEWINE

A good number of brand-new guitars – from very expensive, to mid-priced models and even economy axes – arrive in my shop for what could be called “the final setup.” We like to



think of the work as being that hard-to-measure, five percent that most guitar factories could never be expected to equal – they simply couldn't spend the amount of time fine tuning a guitar that we do and still be in business. Generally the setup work I'm describing includes:

- \* Lubricating and adjusting the truss rod.
- \* Leveling the frets in the Erlewine Neck-jig, then rounding and polishing them.
- \* Making a new nut from bone.
- \* Fine-tuning the bridge saddle radius to match the fretboard

radius and “deluxing” the saddles for a smooth feel and a clear tone.

- \* Pickup adjustment
- \* Possibly replacing el-cheapo electronics.
- \* Setting the action and intonation.

We like to think that the end result is a guitar that plays on a whole different level than when it left the factory. In this instance, “we” is Erick Coleman. Erick heads tech support at

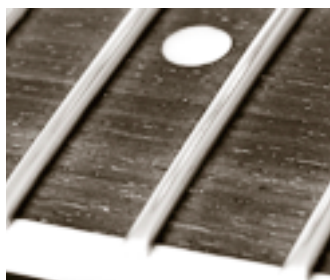


Stewart-MacDonald's Guitar Shop Supply where we both work, plus he works in my repair shop. When ToneQuest Report publisher David Wilson

sent us a brand new Epiphone WildKat for a complete setup, Erick went all out. David wanted to see just how well a mid-priced guitar could be set up.

Actually, we were surprised at how well the guitar played right out of the box. After a complete evaluation, however, we decided that we could make the WildKat play much more better. Here's what we did...

First, we played the new guitar, listening carefully to the pickups. The WildKat comes stock with two P-90 style pickups under chrome dog-ear covers, and they sounded good, but not as good as others we've heard. For grounding reasons, the pickups are soldered to the dog-ear cover, which makes finding a drop-in replacement unlikely. At this point, we sent the pickups (in the covers) off to our pal Jason Lollar who had offered to re-wind them for us. While the pickups were gone, we went about the setup work – starting with the frets.



While the stock frets were well-seated and leveled easily, the guitar sounded kind of thin acoustically when played. We feel that this was due in part to the fact that the frets were pressed in dry with no glue to help hold the them in and to fill the fret slot void. This is something that can be remedied by running a water-thin viscosity super glue under each fret, and it makes a big tonal difference. However, we decided to go all the way for ToneQuest, and we refretted the guitar using Stew-Mac #0158 wire and hot hide glue. After the fret job, we carefully removed and replaced the

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