AUDIO REVIEWS

THE JOULE ELECTRA GRAND MARQUIS OTL AMPLIFIER:

THE ATTEMPT TO BUILD A TUBE AMPLIFIER that dispenses with the output transformer (an OTL) is as old as the art of building amplifiers.

Tubes are basically high-voltage/low-current devices. But speakers need comparatively lower voltages and higher currents. To match them in a trouble-free, reliable way without transformers has been at the heart of the dilemma.

There is evidence at hand that the mission has been accomplished.

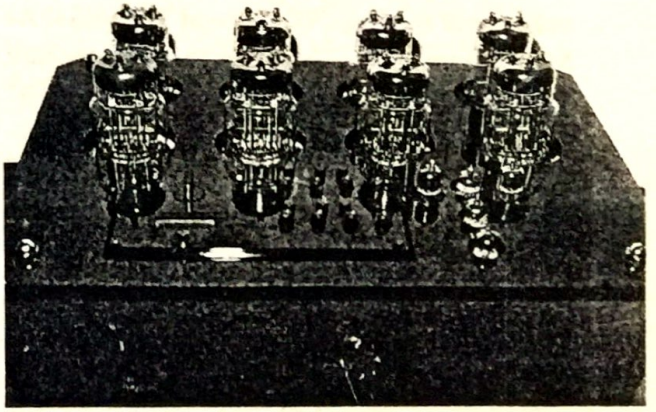
The output transformers that have been and still are necessary adjuncts to most tubed designs are really coloration devices that, unless massively overbuilt, can rob tubes of what they, in theory, can do best: and that is make near instantaneous responses to the ever-changing transients of a music signal. When transistors were first employed in solid-state circuit in the early Sixties, their most cited benefit was the elimination of the output transformer (a mixed blessing in the case of the output transistor, for one reason – its ability, sans transformer, to pass direct current [DC]).

Julius Futterman, working alone in a small Manhattan shop during the early days of the high-fidelity movement, became legendary for what many, including his disciple – the e'er voluble Harvey Rosenberg – considered an heroic effort to produce a commercially successful OTL amplifier. Futterman produced the amplifiers all right, in highly limited numbers, but they were about as reliable as a politician's promise.

Thanks to some space-age materials, and a serious rethinking of the problems of the use of tubes in an OTL circuit, a handful of designers (from AtmaSphere, Transcendent, and Graf) have made genuine progress toward a dependably working OTL amplifier, that elusive Excalibur buried in the stone of technical difficulties.

And, just maybe, no one illustrates the progress of the working OTL amplifier better than Jud Barber, a redheaded soft-spoken engineer from North Augusta, South Carolina, who, along with his ebullient wife, Marianne, has been dedicating much of his energy to the OTL amp for nearly a decade now.

Barber was, until 1993, the vice president of general services at the national headquarters of DSM Chemical of North America, whose headquarters are in Augusta, Georgia. He had "always, always loved designing amps and preamps," a hobby that engrossed him as a teenager during the early Fifties, before Heathkit became a prominent player in the audio world of the times, a world with many more do-it-yourself de-



Joule Electra Grand Marquis OTL Amplifier

signs than the homogenized audiophiles of today would ever encounter. But his designs were for his own pleasure, not for the gods of commerce.

His engineering mentality (that's his background) told him, in the Sixties, that transistors measured so much better than tubed circuits ever would, so "I figured, why worry?" If they measure that good, they must be that good, "not realizing until now how really bad they were."

That "now" came in 1988, when his lifelong pal and audio buddy, Carter Asbill, returned to the Augusta area (after years of work in California) and started to build a house. Barber got, on extended loan, all of Asbill's tubed gear, and after listening, said to himself: "No wonder I don't enjoy audio so much any more" - the transistorized circuitry lay exposed to his ears for what it was, thanks in part to the better transducers of the late Eighties.

His first project was a tube type preamp, the descendant of which is still in the line, along with a phono stage. (He will be introducing, come next year, a triode-based preamplifier that sounds, in principle, as if it is being designed along the same lines as conrad-johnson's ART, but if anything, to even higher standards.) At the core of his affections (if I am not misreading the undercurrent of our interview) would be the OTL amplifier. He never considered making any other kind, despite the formidable problems it entailed. "Why do what everyone else has done?" he asked himself. Why, indeed?

Since the OTL amp was first conceived (in 1990), it has gone through three generations of official changes and who knows how many fine tunings. We here at *The Absolute Sound* have gone through more than half that time with the various versions of the Marquis series, in a long process that nearly drove us to distraction, as untoward and unwanted noises, glitches, and occasional semi-serious problems presented themselves. The earlier versions of the amplifier were seriously romantic in their sound, and maddeningly erratic in terms of the way they would interact with speaker systems of different impedance characteristics.

Always, though, there was that special indefinable "something" that made us hang in there instead of, with usual HP impatience, just throwing up our hands and sending the things back.

The original design of the Marquis, a six-tube drive version, was pure Class A push-pull triode, with zero feedback. And like many another OTL attempt, its frequency response would vary with the speaker systems' internal impedance characteristics. Serious peaks and dips would almost perfectly translate into serious peaks and dips in response, making the Marquis, at worst, bright, bright, bright on speakers with rising impedance in the high frequencies.

Barber, along the way, decided to use a touch (6dB) of global feedback, and at the output, local feedback (3dB). The net result was to lower the amplifier's output impedance to a minimum of 0.6 ohms; with that, to our ears, the Marquis, especially in its improved (and more expensive) 8-tubed monoblock version, sounds remarkably consistent from speaker to speaker system, quite unlike single-ended triode amps of our experience. He also managed to cure the noise and hum problems we had thought intractable, and now the Marquis, a handsome conservative-looking unit, bare tubes and all, has performed for nearly a year well nigh perfectly. 'Tis odd, but 'tshouldn't be, that our opinion of its performance has risen as the quality of our front end, from phonograph cartridge (the Insider Gold) to CD player (the Burmester 929) has improved.

The Grand Marquis III is what the 8-tubed version* is called. It costs $11,000 the pair and, in today's space-warp pricing of amplifiers, represents the closest thing to a bargain I know for a design that pushes the state of the art in showing us a thing or two we didn't know about the performance of tubes (nearly naked, unbuffered by transformers).

Its power rating is 160 watts into 8 ohms, and 100 into 4-ohm loads, which ought to be sufficient for most applications (It is for all of ours, driving everything from the Genesis Ones [sent back to the factory

* All of the tubes Barber uses are of Russian origin; they are 6C33Bs.

last February for an update and still there] to the Pipedreams.) The regular Marquis (also dubbed version III) has 6 tubes, costs $8,800 the pair, and has an output of 100 watts into 8 ohms – not quite enough in our estimation for most applications into which it will likely be placed.

It comes with an external Variac working as a power supply. Barber found widespread voltage variations across the country, even within regions, sometimes as much as 10 volts. Add these variations to those that may occur within the circuit itself, Barber says, and the results will be audible and unacceptable. One turns the Variac up slowly, to 165 volts, at which point the amplifier becomes independent of the line voltage and the voltage distributed evenly among the 8 tubes, each of which must be individually adjusted (the necessary secret of the design's success, says Barber). These one sets for circa 260 milliamps, i.e., a reading of 26 on the amplifier's built-in meters. You can run the bias up to 300 milliamps, but I wouldn't since the sound then becomes a burning love kind of affair. The amount of feedback is, as I explained earlier, adjustable via a separate rotary control on the top of the amplifier's chassis. Turning that control clockwise increases the output impedance from a minimum of approximately 0.6 ohms at a position of 11 o'clock to a maximum of approximately 3.0 ohms at 9 o'clock. The exact value of the amplifier's output impedance is influenced by the input impedance of the loudspeaker. For example, at the 9 o'clock position with speakers of relatively high impedance (8-10 ohms and above), the output impedance of the amplifier may reach a value as high as 8-9 ohms. This flexible feedback tuning, Barber says, has the effect of acting somewhat like a damping control; he usually recommends settings between 6 and 3 o'clock for ported speakers, like his current favorite, the Merlin VSM, made in upstate New York (a smallish speaker system priced at about $5,000 the pair; it does, indeed, within its limitations, sound magical, but it is not competitively priced in my definition of the term). Sealed-box speakers, Barber says, will generally sound best at 6 to 9 o'clock; in fact, the Pipedreams sounds quite delectable at a setting of 6 to 7 o'clock.

Barber's listening has convinced him that the lower impedance of solid-state designs leads to an excessive damping, which plays havoc with the harmonic structure of the bottom two octaves of the music. Such damping may, he says, give the lows more "punch" but at the price of musical truth ("it swallows all the harmonics"). The harmonics collapse (the Telarc bass drum syndrome of the Eighties?) and the bass, while powerful, becomes an undifferentiated mass. To some extent you can hear the harmonics go to pot if you (using a speaker like the Maggies or the Pipedreams) turn the feedback control on the amps to their maximum position. He says his early models of the Marquis lacked bass "punch" – and they did – which the judiciously applied feedback remedied without any loss of harmonic accuracy in the lower frequencies. Additionally, he notes, over-damping in the bass causes "less bloom in the midrange and treble," moreover, "the tighter you get the bass, the less realistic and satisfying it is." You can add the maximum feedback on his amp, and with the wrong speaker, "all the beauty will go away and the music will sound more like a salad."

So much for the conceptual basis and some of the observations that Barber has made about the results. Now, the question, how does it sound?

Well, let's let the amplifier warm up for about 30 minutes, then set the bias of each tube (a simple affair - push a button, check the reading, and then rotate a small pot until the reading is where you want it). Does it drift? Yes, a bit, over the hours of a listening session. I don't worry with the settings, once done, unless the amplifier starts to sound either bright or is on the verge of clipping, which I've seldom heard it do, even when stressed by the mightiest dynamics Reference Recordings and HDCD can throw at it.

Let's begin then with the observation that its clipping characteristic is as close to inaudible as I've heard from a tube-driven amplifier. It does not, audibly or obviously, compress dynamics as the tubes are driven to the limit (try, on RR's sampler, *Tutti*, either the climax of *The Firebird* or *Pictures*

at an Exhibition, if push things you must; ditto for *Sorcerer's Apprentice* on RR's *Mephisto & Co.*). Neither does the instrumental dimensionality collapse, nor the soundstage shrink. What is awfully, awfully amazing to these ears is the stability of the soundfield under stress. You can still hear, during the mightiest *forte* passages, smaller less noisy instruments playing deep inside the orchestral texture - this is an effect easily perceived in concert and almost never in home playback. Nor does the distortion appear (to the ear) to increase during thunderous and climactic moments, so your ear doesn't have to "shu. down" (which it can do on music played too loudly in the home).

Let's stop to think about this a moment. Listening to an orchestra in the hall, we never find the sound ear-splittingly loud. Loud, oh lordy yes, and thunderous, but never excruciating (oh well, not outside Avery Fisher Hall, usually) and never painfully. You simply take volume increases, sans distortion, for granted in a concert setting. This very characterist of the Joule Grand Marquis lends it a kind of authenticity few amplifiers of its power rating have (something, yes, we take for granted with the Reference 600, and one of the things that made listening sessions with it so freeing to the ear). Most amplifiers, including almost all of the transistorized units of fewer than four or five hundred watts, change character when they are pushed. Not only does their frequency balance change, but their odd-order distortion figures, especially on momentary high voltage peaks, go through the roof.

There is also a curious sort of purity to the sound. Now I don't mean by "purity" what many may be hearing with certain amplifiers of "irradiated transparency."*

Purity, in that context, may mean the absence or deletion of harmonic information, a certain kind of nearly inaudible cleaning up of the sound, perhaps even the removal of certain cacophonous harmonics that rightfully should be in the music. No, in this case I mean something more complex that I'm not sure I can rightly describe. So let's begin with some metaphors. Imagine it's near sunset on an exceptional fall evening. We're at the magic hour (for its visual equivalent, see Terence Malick's *Days of Heaven*). The air is perfectly clear. No smog. No pollution. Fresh after a rain. Now that's purity in the sense I am getting at it. Or you even have that kind of purity on a dark night, the ones you get in the countryside, when the air is so clean the heavens look befreckled with stars.

The Grand Marquis isn't an amplifier of irradiated transparency. Insofar as it goes, it is indeed transparent in its "purity," which, I think, means the virtual absence of all the normal electronic additives and artifacts you get from miles and miles of circuitry and devices. If its top octave were more extended, it might be somewhat airier and filled with bloom (assuming those qualities in moderation, not as descriptions of euphonics). But at its best, say, as with the Burmester 808 Mk V, the Joule Grand Marquis goes way up there, but not all the way. The net result of this is not a darkened sound in the way we usually describe that (possibly the result of too much feedback and a transformer induced roll-off starting, in millibels, below 20KHz). It is almost perfectly neutral, if you can imagine that, without being mega bandwidth. (Think of an uncolored Audio Research D-79.)

Where it comes, startlingly, into its own is with the reproduction of transients. Again, I will have some trouble describing this because this kind of "immediacy" and quickness I don't recollect ever having heard from any tubed design, nor do I recollect hearing anything close in this one regard. I'd call it a kind of "thereness," if I thought that would convey the presentation of a complete dynamic envelope, without "edges" or artifacts, around each instrument. You don't necessarily have the sense of speed when an instrument is playing (take, e.g., the bassoon work in *The Sorcerer's Apprentice* cut we mentioned); it just seems to appear out of its own pocket of air and be there, a fully developed harmonic entity unto itself. It simply appears, all at once. You take this for granted in the same way you'd take for granted the same sound in a concert. You don't stop to think about it or analyze it. Wood-

*Thanks, Auntie Enid, for reminding me that I said that.

winds, needless to say are well nigh ravishing when this amplifier is in the system (e.g., the work in the Berglund/Finlandia Sibelius *Seventh*; or those in the Mercury CD of Hanson's *The Composer and his Orchestra*). And what can I tell you about the guitar overtones (try some of those unamplified on Cat Stevens' LP of *Mona Bone Jakon*) except that you'll understand why folks fall in love with its sound (in case you don't already know). There's both attack and sweetness to these instruments. An unbeatable combination. (The layering into deep stage of instrumental transients in *Casino Royale* proved a revelation to this writer who thought he knew all there was to know about that disc. And Dusty. Dusty sounded fresh, as if she had just stepped into her isolation booth. The sexiness that had disappeared as a result of overplaying the disc was there once again.)

I do believe that Barber is absolutely right, if not in theory, then in having gotten the bass and midbass harmonics put back into the music. You'd need musical examples. The opening string basses in the Mehta LP of Holst's *The Planets* become, instead of a weighty growl, a section made up of harmonically diverse instruments with considerable attack, and no loss of weight. The now amusing example Hanson cites when he singles out the doublebass in the CD of *The Composer and His Orchestra*. He has them play alone as an example of how bland they can sound without supplying texture for the other strings – but how powerfully rich they now sound. Or that famous string bass solo that opens the second movement of Reiner's reading of *Lt. Kije* (LP); now there's no mistaking it for a cello.

I could go on and then again on. But I think the point is clear. The Marquis would be an exceptional achievement, no matter what its source. If the other OTLs on the market, and those that will come in future times, can achieve this degree of stable behavior and realism, then we will have edged one step closer to the state of the art. I don't know whether I could call it the best amplifier on the market – it has many serious competitors that rival its performance in some vital regards, and who knows, it may not prove compatible with all the weird-in-impedance speakers out yonder – but I can say that it has joined those tubed amplifiers at the top of the field, and in some ways, leads the pack.

HP

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Price: $11,000/pair

The Joule Electra Grand Marquis O(utput)T(ransformer)L(ess) monoblocks
★★★★

While there's no such thing, we fear, as a best amplifier. So far I haven't heard one that surpasses the Joule's transient speed, immediacy, and supreme faithfulness to music's shape and contour. See Review, this issue.