# Listening #171: Bob's Devices Sky 40 transformer

By Art Dudley • Posted: Feb 21, 2017


In contrast with such line-level source components as DACs and CD players, record players generate a lower-voltage signal that requires extra gain (footnote 1) from either a standalone phono preamplifier or the phono stage of another, more comprehensive component in one's system—typically, a full-function preamplifier or an integrated amp.

But when the phono cartridge of choice is a moving-coil (MC) type, which generates even less voltage than its moving-magnet (MM) and moving-iron (MI) friends, even *more* gain is required. This presents the user with an additional choice: he or she can select from among the many standalone phono preamps that offer sufficient

gain, or augment an existing phono or full-function preamp or integrated amplifier with a phono step-up transformer, which boosts gain passively, without using tubes or transistors (footnote 2)

A transformer can do this because it's naturally good at inverting ratios between certain electrical characteristics—in this case, current and voltage. An MC cartridge is a prodigious source of signal current but a poor generator of signal voltage; when you apply its signal to the primary coil of a transformer configured as a phono step-up, the transformer's secondary coil will output a signal that is comparatively low in current and high in voltage. Just like that.

Why would you buy a step-up transformer instead of just sticking with a high-gain phono preamp? Because, with exceptions, transformers offer better sound—providing more drama, more color, and, especially, greater touch and impact. (Your mileage may vary. Use only as directed. Offer not good after curfew in Sectors R or N.) It has long seemed to me that by loading the coils of a phono cartridge with the primary coil of a transformer, particularly in a system in which the voice-coils of the speakers are driven by the output transformers of a tube amp, a certain magic is achieved—a condition wherein music breathes in and out in a manner not unlike real music. As I wrote in the June 2010 edition of this column, "There may be no better way to load a coil or drive a coil than with a coil."

**The primaries were fixed**

Which brings us to the new Sky 40 stereo phono transformer ($1250) from Bob's Devices (footnote 3), which joins the identically priced Sky 30. At present, the Sky 40 is available only with a 1:40 turns ratio—*ie*, the ratio between the number of turns of wire in its primary coil and the number of turns in its secondary, which determines the phono transformer's gain. (A higher ratio equals higher gain.) By multiplying the base-10 logarithm of its turns ratio by 20—a formula that works for any step-up transformer—we can predict that the Sky 40 will exhibit 32dB of gain.

According to Bob Sattin, of Bob's Devices, the transformers used in the Sky 40 are a completely new design: CineMag, the Canoga Park, California company that designs and winds those transformers, has reduced the number of turns by 20% compared with their previous phono-transformer design, the CineMag CM-1131. That benefits high-frequency performance—but in order to do so without also diminishing low-frequency performance, CineMag had to come up with a higher-performance core material. According to Sattin, the choices for CineMag were to switch to an amorphous core, or "to improve the [core] laminations to a level that had never been done before." Because amorphous cores are said by Sattin to have "inconsistent" magnetic properties, CineMag's David Geren set about designing and making his own laminations—the metals used are a trade secret—with results that are reportedly superior to those achieved by CineMag's previous core supplier.

Other technical details are in keeping with previous offerings from Bob's Devices. The Sky 40 is supplied in a cast-aluminum case with a gloss-black powder-coat finish, fitted with gold-plated RCA input and output jacks, a gold-plated ground terminal, and a C&K toggle switch that lets the user lift the signal ground from the chassis ground when called for. (The need for this will vary from system to system, dictated by the presence of hum.) Of even greater importance, the Sky 40's internal connections are made by means of *resistance soldering*, a process in which a combination of high current and an electrically resistive stainless-steel soldering contact are used to quickly heat only the solder join—thus avoiding the melting of fragile wires by means of heat conduction. (Interestingly, resistance-soldering stations require a voltage step-down transformer: more symmetry!) As a hobbyist who once ruined a pair of Quad ESL transformers while unsoldering the resistors within their integral crossovers, I am particularly sensitive to this matter.

**Don't be denied**

The first time I listened to the Bob's Devices Sky 40 in my system, even before it was broken in, two words occurred to me at more or less the same instant: *huge* and *detailed*. As I would learn in the weeks to come, those two qualities consistently worked together to make this one of the two or three very finest transformers I have ever heard.

I'd been listening to the Beatles' *Revolver* (Parlophone PCS 7009) using my Shindo-rebuilt Ortofon SPU pickup and an Auditorium 23 Hommage T1 step-up transformer—a combination that sounded magnificent: big, colorful, impactful, and nuanced, with lots of musical drive. Given the SPU's low output and low internal resistance (respectively, 0.2mV and 2 ohms), I guessed that the high-gain, high-impedance-ratio Sky 40 would suit it—and I guessed right. I went back to side 1 of *Revolver* and listened to "Eleanor Rigby," a recording in which the lead vocal appears in only the right channel during the verses (footnote 4), with its (auto-)double-tracked facsimile added to the left channel for the first two choruses—a bit of trickery, presumably done in the mix, that also makes the recording space as a whole seem to increase in size during those choruses. The Sky 40 not only clarified the difference, it allowed the recording to sound even larger than through the Hommage.

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Footnote 1: It also requires phono-specific equalization, a topic for another day. See my column in the January 2009 issue.

Footnote 2: Head amps, defined by most phonophiles as *active* MC-appropriate gain stages without RIAA de-emphasis, are awfully rare these days, so I'm not going to mess with a perfectly good sentence structure just to fit them in.

Footnote 3: Bob's Devices, 302 S. 27th Street, Billings, MT 59101. Tel: (910) 612-8666. Web: www.bobsdevices.com.

Footnote 4: Actually, for the first second of the first verse, the vocal appears in both channels, only to be suddenly dropped from the left.

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COMMENTS

### Sector R

Submitted by GLADYS ZYBYSKO on February 22, 2017 - 1:42pm

They NEVER come up into the hills!



### Well-designed SUT's and lo-output coils ROCK

Submitted by jimsusky on February 23, 2017 - 3:52pm

I wholly agree that a well-designed SUT is a fabulous - even cost-effective way to amplify lo-output moving-coil pickups. Two plausible reasons:

1) Lo-output coils have a supersonic high end - due to low coil inductance.
2) Moving coil transformers, being entirely passive, contribute zero noise.

Add to this the practical benefit that an SUT allows virtually the entire world of phono-preamps to be used - with a little attention paid to the preamp's overload margin. I believe it is a much simpler design

challenge to hold noise down with less gain required for the active preamp.

I well-remember the "L-strapped Cotter Brick" (MK-2L) which offered 37db voltage gain. That worked very nicely with the various lo-output Ortofon, Fidelity Research, and Accuphase pickups of 1981-1986 or so.

Kudos to Art Dudley for giving the simple voltage gain to db gain relation. but I'm not sure where Art got the:

*ca 5 ohm (presumed) primary coil* figure.

A 40:1 transformer will "transform" the input impedance of the phono preamp using a squared-law relation. In this case, for a 47k-ohm input impedance:

Impedance "seen" by the pickup = (47,000)/[(40)(40)] = 47,000/1,600 = 29.4 ohms.

Round it up to 30 ohms.

Perhaps Art meant the DC impedance of the primary coil is 5 ohms. Perhaps the manufacturer will weigh in.

(I'm not so sure using an ohm-meter with a 9-volt battery is advisable to check this)

Anyway, terrific review.

(considering inflation, $1200 is quite reasonable compared to the $600 the Cotter cost ca. 1979-1981.)



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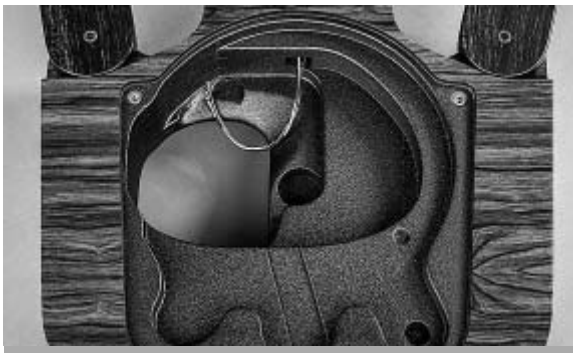

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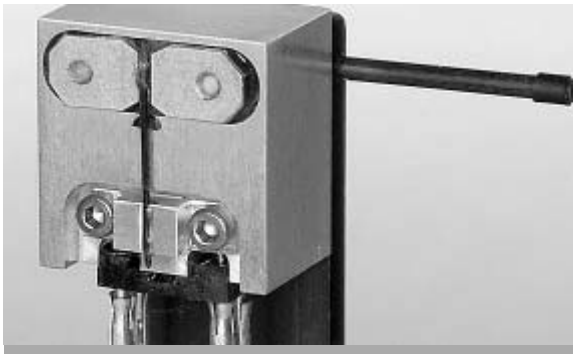

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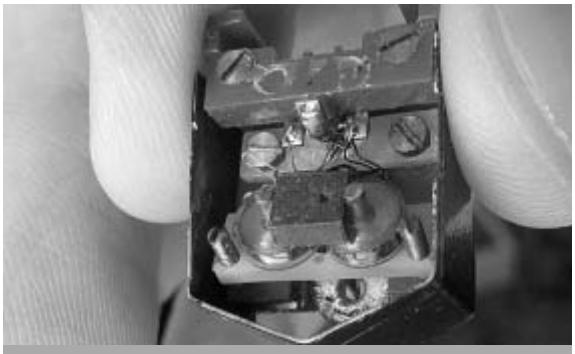

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