

# Monarchy SE-100 MK2 & SM-70 Pro Power Amplifiers

A look at Monarchy's new pro power amps

Monarchy SE-100 MK2 and SM-70 Pro Power Amplifiers

Monarchy Audio  
380 Swift Avenue, #21 South  
San Francisco, CA 94080  
(650) 873-3055  
[www.monarchyaudio.com](http://www.monarchyaudio.com)  
[monarchy@earthlink.net](mailto:monarchy@earthlink.net)

Price: \$1,179 each (either model)

Monarchy Audio has been manufacturing affordable, high-performance power amplifiers since the mid-1990s, when it introduced the original version of the SE-100 Delux monaural power amp. The SE-100 Delux featured a complementary MOSFET output stage and discreet, single-ended bipolar circuitry for the remainder of the feedback-based topology. A few years later, Monarchy introduced the SM-70 Pro, a slightly higher-powered version of its original SM-70 amplifier. The SM-70 amps were also based on complementary MOSFET output stages, along with op-amp-based input/voltage-gain circuitry. They were billed as “zero feedback,” since they did not employ global feedback from the output to the input stages. The SM-70 could be used as a stereo or a monaural power amp. These high-value amplifiers held their own in audiophile circles for 15 years and were favorably reviewed in many high-end audio publications. I reviewed the SE-100 Delux amplifier in the September 2000 issue of *Audio Electronics* (a predecessor to *audioXpress*), and the SM-70 Pro in *audioXpress* (September 2001). Both amplifiers have been recently updated. The SE-100 MK2 design has been significantly improved, and both amps have undergone changes that result in higher reliability.

## SE-100 MK2

Like its predecessor, the SE-100 MK2 is a monaural power amplifier, requiring two amplifiers for stereo. I have long believed in monaural power amps, which are often called “monoblocks” in high-end audio circles. Complete isolation of the two amplifiers yields superior soundstage presentation, and often better dynamics when compared to stereo power amps. With monaural amplifiers, the amps can be placed close to the loudspeakers, so loudspeaker cables can be kept as short as possible. Longer interconnects and short speaker cables are usually preferable to short interconnects and long speaker cables. Although the SE-100 MK2's case and heatsinks are identical in size to the original SE-100 Delux, the amplifier's appearance has been noticeably improved (see **Photo 1**). The new, black-anodized handles are oval. The front and rear panels are laser engraved, and the front panel has a cleaner, less cluttered look than its predecessor.

Although the SE-100 MK2 resembles its predecessor, the amp has a substantially

upgraded design. Like its predecessor, the SE-100 MK2's input and voltage gain/driver circuitry is based on discrete, bipolar technology (see **Photo 2**). The MK2 amps employ a current-mirror input, making the input stage more stable throughout its entire dynamic range. The “SE” in the model designation refers to the single-ended differential input and voltage gain/driver stages, in contrast to the full-complementary differential inputs used in many power amp designs. By definition, the single-ended circuitry operates Class A. The current sources for both the input and cascode voltage gain/driver stages have been improved, lowering distortion and increasing speed.

All circuitry ahead of the output stage is powered by a pair of LM317/337 three-terminal IC regulators, fed from the main  $\pm 50\text{-V}$  unregulated DC rails. This is exactly as it should be, since the input and voltage-gain stages have the most to gain from clean, regulated DC supply rails. The output stage provides current gain, so absolute stability of the DC supply rails is not nearly as critical. The SE-100 MK2 is supplied with a 450-VA toroidal power transformer. Shindengen D6SB60L low-noise, soft-recovery rectifier bridges are standard, and the amp contains separate bridges for the positive and negative supplies (see **Photo 3**). The raw filter capacitor bank consists of four 15,000- $\mu\text{F}$  capacitors, for a total of 60,000  $\mu\text{F}$ .

The old power amps used Hitachi 2SK1058 and 2SJ162 MOSFET output transistors in a full-complementary, push-pull arrangement, four of each per amplifier. These transistors have a 160-V drain-to-source rating, a 7-A drain current, and 100-W channel dissipation. The original



Photo 1: A pair of Monarchy SE-100 MK2 monaural power amplifiers. The rear panel (a) shows the unbalanced RCA and balanced XLR inputs, binding posts for loudspeaker connections, and an IEC AC power connector. The front panel (b) sports new oval handles and a cleaner appearance than the original SE-100 Delux amplifiers.

output stage had virtually no protection circuitry for the output devices. The 2SK2221/2SJ352 complementary pair have replaced these transistors for the MK2 amplifiers. Channel dissipation is still 100 W, but drain-to-source voltage is rated at 200 V, and the drain current is 8 A. Monarchy notes the higher current capability enables the SE-100 MK2 to drive 2- $\Omega$  loads (the original amp was limited to 4  $\Omega$ ). The new amps also feature a sophisticated output protection scheme. This translates into higher reliability. Monarchy also notes the amps have positive overdrive protection and very clean clipping.

Although the SE-100 MK2 became available in 2009, the latest version reflects significant recent changes. First, some samples of the SE-100 MK2 and the original SE-100 exhibited a low-level oscillation. MOSFET output stages can be finicky when it comes to layout and compensation. In the amplifiers's current production, gate-to-drain compensation capacitors have been added to the N-channel output transistors. This appears to have completely killed the oscillation. My latest samples are problem free. The main PC board has also been redesigned with a new layout and wiring scheme, resulting in an even lower noise floor.

The MK2 amplifiers have an extremely low output DC offset. My amps were both well under 5 mV and, unlike the old SE-100, there's no need to short the inverting input of the XLR connector (Pin 3) to ground when feeding the amp from unbalanced sources. The SE-100 MK2 seems relatively immune to impedance mismatches on the noninverting and inverting inputs, at least as far as DC offset is concerned. (Common-mode rejection is another matter.) The old SE-100 amplifier produced a hefty turn-on thump, which has been eliminated in the MK2 version with a time-delay relay in series with the output. The output relay is a Bestar CS-115CA, rated at 12 A/120 VAC, and the relay activation circuit senses the output offset and closes the relay after the offset has dropped to a safe level. Turn-on and turn-off on the new amps is completely silent.

For owners of the original SE-100 Delux amplifiers, Monarchy offers a reasonable upgrade plan. Replacing the

main PC board or both MOSFET output boards costs \$100 per amplifier. A pair of the Shindengen rectifier bridges costs \$50. Monarchy has a flat labor charge of \$50, so one amplifier can be completely updated for \$300. Although you can update the main PC board, the output boards, or the rectifiers, I highly recommend a complete upgrade, combining an extremely worthwhile sonic improvement along with increased reliability.

### SM-70 PRO

The latest version of the SM-70 Pro is nearly identical to the original

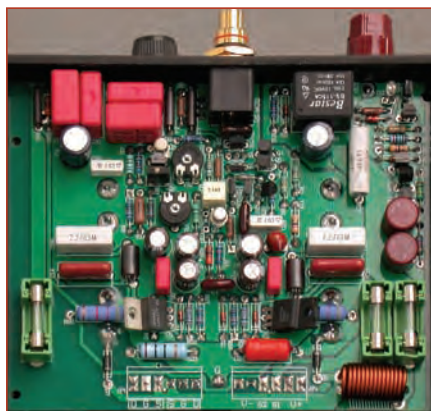


Photo 2: The SE-100 MK2's main PC board houses the input and voltage-gain/driver circuitry, which is based on discrete, single-ended, bipolar technology. This circuitry is regulated with a pair of LM317/337 three-terminal regulators shown near the bottom. The output muting relay in the upper right is activated with a delay circuit that ensures silent turn on and shutdown.



Photo 3: This is an inside view of the SE-100 MK2 amplifier. The new MOSFET output PC boards are mounted on the heatsinks, under the main PC board. The hefty, 450-VA toroidal power transformer and Shindengen low-noise, soft-recovery rectifier bridges are in the front portion of the amplifier.

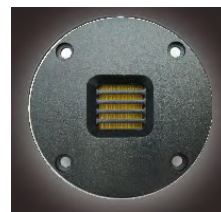


### THE WINGS OF MUSIC

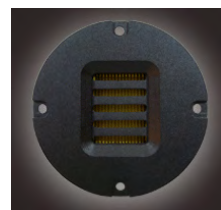
Airborne is proud to introduce a new line of Air Motion Transducers and Ribbon Tweeter. Including the smallest AMT in the world and an open back type Planar Ribbon.

AMT are known for their fast transient speed and very good dispersion. The models we propose are closed back type for ease of usage.

The Planar Ribbon is very small and is an open back type, which is very good for line arrays and open baffle applications.



**RT-20021** 3KHz to 40KHz, 88db.



**RT-4001** 2KHz to 27KHz, 89db.



**RT-5002** 3KHz to 30KHz, 95db.



**RT-4101** 4KHz to 40KHz, 86db.



SOLEN Électronique Inc.  
4470 Av. Thibault  
St-Hubert, QC J3Y 7T9  
Canada  
Tel.: 450-656-2759  
Fax.: 450-443-4949  
Email: [solen@solen.ca](mailto:solen@solen.ca)  
<http://www.solen.ca>



in appearance (see **Photo 4**). For the newest version of the SM-70 Pro, Monarchy has given the amp the same MOSFET upgrade as the SE-100 MK2, replacing the old 2SK1058/2SJ162 transistors with the heftier 2SK2221/2SJ352 devices (see **Photo 5**). With the new output devices, the amps can drive 3- $\Omega$  loads continuously, and 2- $\Omega$  loads on an intermittent basis. The SM-70 Pro is a stereo amplifier. In each channel, two of each device are used in a full-complementary, push-pull arrangement. The SM-70 Pro's output stage operates as an open-loop buffer, with zero

global feedback. The circuit topology for the output stage includes trim pots for DC offset, which I have found extremely stable over time. The trim arrangement is used in a pair of original SM-70 amplifier that I have in my office at The Crane School of Music, SUNY Potsdam. After nearly 15 years of use, the offset trim has never required adjustment.

The input/voltage-gain circuitry is based on a TI/Burr-Brown OPA2604 FET-input dual op-amp (see **Photo 6**). The SM-70 Pro's maximum voltage output is limited not by the output stage, but by the supply rails powering the op-amp. The OPA2604 is unique in that it can run on up to  $\pm 24$ -V rails, making it ideal for this application. In the amp's original version, Monarchy used trim pots in the dividers that set the LM317/337 regulators's output voltages. I was always uncomfortable with these since it was too easy to exceed the op-amp's absolute maximum supply rating. For the SM-70 Pro's latest version, Monarchy uses fixed resistors and set the supply rails at  $\pm 23.5$  V. In each stereo channel, Monarchy uses the second half of the op-amp as a unity-gain follower in a current doubling arrangement similar to the one described in Morgan Monks's application bulletin, "Double the Output Current to a Load with the Dual OPA2604 Audio Op Amp," (Burr-Brown AB-051, 1993) on Texas Instruments's website ([www.ti.com](http://www.ti.com)). The added output current

is necessary for the op-amp to drive the output stage to full rated power. The SM-70 Pro's raw power supply is similar to that of the SE-100 MK2, with a 350-VA toroidal power transformer, a pair of Shindengen low-noise, soft-recovery rectifier bridges, and four 15,000- $\mu$ F capacitors in the raw filter bank.

One welcome change in the SM-70 Pro is the lower voltage gain. In the amp's original version, Monarchy set the op-amp for a voltage gain of 34 (30.6 dB), using feedback/divider resistor values of 33 k $\Omega$  and 1 k $\Omega$  in the op-amp's feedback circuit. I found this too high, forcing me to operate my pre-amp volume control at a very low setting. In the amp's latest version, the 33-k $\Omega$  resistor has been lowered to 22 k $\Omega$ , for a voltage gain of 23 (27 dB). The SM-70 Pro can be operated as a bridged mono amplifier, fed from an unbalanced source, or as a fully balanced mono amplifier when fed from a balanced source. Most users will operate this amplifier in a "monoblock" arrangement, since a single stereo SM-70 Pro's power output is fairly modest. But, there are certainly applications for a low-power stereo amplifier with the high-level performance offered by the SM-70 Pro. It would be ideal with high-sensitivity loudspeakers, and it would make an excellent computer audio amplifier, particularly when fed by a USB-connected DAC/pre-amp, such as the NuForce Icon HDP (reviewed in *audioXpress* April 2011) or Benchmark DAC-1 USB (reviewed in *audioXpress* January 2009). It would also

be suitable for powering a home theater system's rear channels.

## CLASS A DETAILS

Both the SE-100 MK2 and SM-70 Pro power amps have output stages biased for Class A operation up to 15 W of output. They run quite warm in normal operation, but they are a lot cooler than an amp operating pure Class A up to full-rated power. Above 15 W, the output stage slides into Class AB operation. Monarchy President C.C. Poon offers the following comments on Class A operation as it applies to MOSFET output stages: "The Class distinction is a moot point

with the MOSFETS we use, which operate into the gigahertz region. Class distinction is much more critical with bipolar transistors, which operate in the megahertz region at best. In other words, the MOSFETS operate thousands of times faster than bipolar transistors, rendering crossover distortion almost immeasurable. Class A operation at full power output becomes unnecessary and actually quite inefficient. The MOSFETS in both the SE-100 and SM-70 Pro also operate purely in current gain mode only. The voltage gain stages in both amps operate in



Photo 4: A pair of Monarchy SM-70 Pro power amplifiers are pictured with the rear panel (a) showing the unbalanced RCA connectors for stereo connections and a single XLR connector for fully-balanced monaural operation.

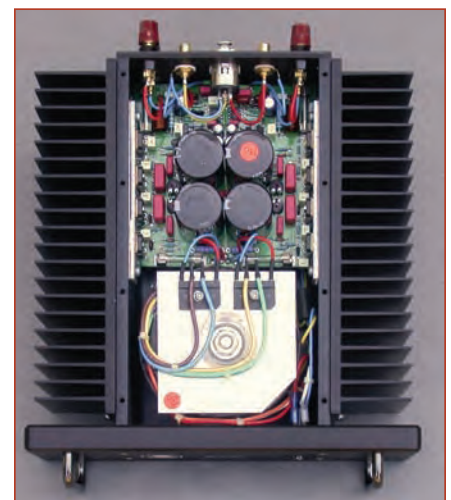


Photo 5: A look inside the SM-70 Pro power amplifier shows two pair of complementary MOSFET output transistors mounted on each heatsink. The output transistors are soldered directly to the main PC board. The hefty, 350-VA toroidal power transformer and Shindengen low-noise, soft-recovery rectifier bridges are in the front portion of the amplifier.

pure Class A, all the way to full power output."

I would add that operating the output stages Class A up to 15 W also ensures the output devices operate with excellent linearity at low-signal levels.

### THE SOUND: SE-100 MK2

The latest Monarchy SE-100 MK2 amplifier version is clearly a more refined amp than its predecessor, improving on an already excellent design. The amplifier's most immediately striking characteristic is its detail and transparency. On well-recorded material, it offers a clean window on the original performance, without ever sounding sterile or overly analytical. The detail level on well-recorded, high-resolution sources is remarkable. Listed in parenthesis are the websites and product numbers where these recordings can be found. Especially noteworthy in this regard is Reference Recordings's amazing 176.4-kHz/24-bit HRx release of Stravinsky's *The Rite of Spring* with Eiji Oue and the Minnesota Orchestra ([www.referencerecordings.com](http://www.referencerecordings.com), product number HR-70), and the Esoteric SACD remastering of the "Interlude and Dance" from Manuel de Falla's *La vida breve* with Ernest Ansermet and L'Orchestre de la Suisse Romande, a superb Decca/London recording made in Geneva's Victoria Hall in 1961 ([www.esoteric.teac.com](http://www.esoteric.teac.com), product number EESD 90016). The Reference Recordings HRx releases are .wav files supplied on DVD-R discs, intended for playback on a computer music server. But, if you own an Oppo BDP-93 or BDP-95 Universal Player, you can play the .wav files on the Reference Recordings discs. There's no need to use a computer server. (Amplifiers as refined as the SE-100 MK2s deserve a suitable digital source. The Oppo BDP-95 is an excellent complement to these amps.)

The SE-100MK2 excels in revealing subtle harmonic details. I found this particularly striking at the beginning of Dukas's *The Sorcerer's Apprentice* with Charles Munch and the Boston Symphony Orchestra, where the violins play soft, delicate harmonics ([www.classical.net](http://www.classical.net), RCA Victor Living Stereo CD 68978-2). Tonally, the amplifier is very well-balanced, and the upper midrange and treble region are silky smooth and utterly natural. The midrange has excellent detail

and liquidity, and articulation across the entire spectrum is most impressive. The beginning of the 3<sup>rd</sup> movement of the famous Vox/Turnabout recording of Rachmaninoff's *Symphonic Dances*, with the Dallas Symphony—conducted by Donald Johanos and superbly engineered by the late David B. Hancock—contains figurations in the high violins that are rendered with uncanny clarity and realism by the SE-100 MK2 amplifiers ([www.analogueproductions.com](http://www.analogueproductions.com), Analogue Productions SACD CAPC34145 SA).

MOSFET amplifiers are often unfavorably compared to bipolar designs when it comes to low-frequency performance. The SE-100 MK2 should put those biases to rest. This bass region is extended, clean, and well defined. On the Reference Recordings *Rite of Spring*, the bass drums' power, impact, and extension are amazing. The SE-100 MK2 achieves this along with remarkable clarity and control. This amplifier enables you to hear the instruments' characteristics. In the 1980 Telarc recording of the same work with Lorin Maazel and the Cleveland Orchestra—

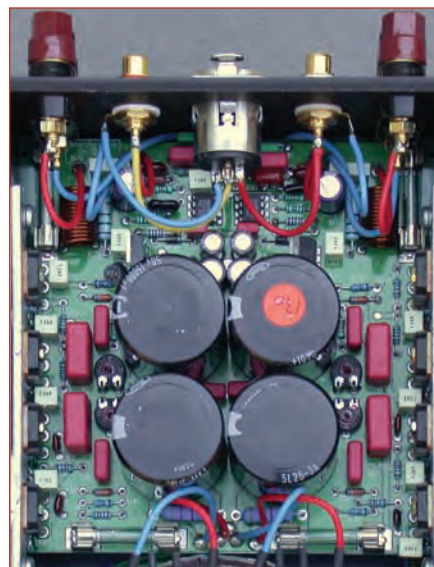


Photo 6: A close-up of the SM-70 Pro's main PC board shows the front-end circuitry, which is based on OPA-2604 dual op-amps running on  $\pm 23.5$  V, regulated by an LM317/337 pair. Voltage gain is accomplished with conventional feedback, but the amp doesn't employ any global feedback from output to input.

using the Soundstream digital recorder—the bass drums were tuned fairly tightly. ([www.classical.net](http://www.classical.net), Telarc SACD-60563).

## High End Audio components for the BEST quality sound since 1999



"At Black Rhodium we have used the Eichmann bullet plugs for many years. We are very keen to design our products to reproduce music as naturally as possible and the bullet plugs that we use does this far more effectively than the metal plugs which we use, either for cosmetic purposes or for low cost applications."

—Graham Nalty - Black Rhodium

[www.eti-research.com.au](http://www.eti-research.com.au) • [TrevorH@eti-research.com.au](mailto:TrevorH@eti-research.com.au) • ph.:+61 7 3881 5588

ETI



The Minnesota Orchestra's bass drums, in the Reference Recordings version, are tuned more loosely, so they ring longer after the initial impact. The SE-100 MK2 amp enables you to hear the striking differences between these instruments and the recording venues' acoustics.

I've been a believer in mono power amps for many years, primarily due to the excellent sound-staging complete power supply isolation provides. The SE-100 MK2 amps reproduce a large lateral soundstage, with precise localization and a lot of depth. These amps reveal the soundstage differences between conventional Red Book CDs and carefully mastered, high-resolution digital sources. These gutsy amplifiers also deliver dynamics that belie their relatively small footprints, and they never become congested, even on heavily scored orchestral recordings. The detail level I noted on the Reference Recordings *Rite of Spring* is maintained even in the score's very dense passages. Monarchy has also lowered the noise floor on the MK2 amplifiers. The new amps are very quiet.

Having owned a pair of the original

SE-100 Delux amplifiers, I highly recommend Monarchy's total upgrade package for existing amplifiers. Monarchy continues its high-value tradition with the SE-100 MK2—a refined audiophile amplifier with high-end performance at a reasonable price.

## THE SOUND: SM-70 PRO

I evaluated the SM-70 Pros using a pair of the amps as mono amplifiers, both in bridged mono mode from my unbalanced pre-amp, and in true balanced configuration driven directly by the balanced outputs on my Oppo BDP-95 universal digital player. The SM-70 Pro amplifiers offer many of the virtues of the SE-100 MK2s, namely detail, resolution, excellent soundstage reproduction, and impressive dynamics. Monarchy's goal has been to combine the virtues of solid-state and tube designs, and it's been remarkably successful. I don't use any tube equipment in my system. I prefer the well-designed solid-state equipment's accuracy to the tube's sometimes overly euphonic colorations. Monarchy

has succeeded admirably in balancing those two characteristics. The SM-70 Pros have a bit of tube-like warmth, without being excessively euphonic, along with the transparency, detail, dynamics, and bass I expect from a good solid-state amplifier. The tube-like warmth can be captivating on low strings. In the "Gnomus" section of the Fritz Reiner/Chicago Symphony recording of the Mussorgsky/Ravel *Pictures at an Exhibition* the violas, cellos, and contrabasses have a gutsy, authoritative sound that is palpably real ([www.classical.net](http://www.classical.net), RCA Victor Living Stereo Gold CD 68571-2).

As with the SE-100 MK2 amps, the SM-70 Pros belie the negative views often held on the bass performance of MOSFETs. The bass is clean, well defined, and powerful. Although the SM-70 Pro amps are rated at less power output than the SE-100 MK2, you'd never know it from the sound. Advocates of zero-global feedback designs often cite the sense of unrestrained dynamics as one of their virtues. The SM-70 Pros certainly leave

## Custom Front Panels & Enclosures



**FREE Software**

Sample price \$57.32 + S&H

Designed by you using our FREE software, **Front Panel Designer**

- Cost effective prototypes and production runs
- Powder-coated finish and panel thickness up to 10mm now available
- Choose from aluminum, acrylic or customer provided material
- 1, 3 and 5-day lead times available

**FRONT PANEL EXPRESS**

**FrontPanelExpress.com**  
**1(800)FPE-9060**

## SPECIFICATIONS

### SE-100 MK2

- Damping Factor**
- Better than 600 from 10 Hz to 400 Hz
- Dimensions**
- 9" x 5" x 12"
  - Net weight: 22 lb
  - AC voltage: 117/234 V, 50/60 Hz
- Frequency Response**
- -0.1 dB, 20 Hz to 20 kHz at 1 W
  - Signal-to-noise ratio: Greater than 120 dB below rated FTC full bandwidth power
  - Slew rate: 50 V  $\mu$ s
  - Input impedance: 40 k $\Omega$
- Input Sensitivity**
- 1.5 V<sub>pp</sub> for full output
- Intermodulation Distortion (IMD)**
- Less than 0.05% from 250 mW to full-rated FTC power
- Power Consumption**
- 400 W
- Power Output**
- 8- $\Omega$  load: 100 W RMS
  - 4- $\Omega$  load: 200 W RMS
  - Power bandwidth: -3 dB from 5 Hz to 100 kHz
- Total Harmonic Distortion (THD)**
- Less than 0.01% at full rated FTC power from 20 Hz to 20 kHz
- Voltage Gain**
- 26 dB

### SM-70 Pro

- Dimensions**
- 9" x 5" x 12"
  - Net weight: 20 lb
  - AC voltage: 117/234 V, 50/60 Hz
- Frequency Response**
- -0.25 dB, 20 Hz to 30 kHz
  - THD: less than 0.05%
  - Signal-to-noise ratio: Better than 90 dB in stereo mode; better than 100 dB in balanced mono mode
- Input Impedance**
- 75 k $\Omega$
- Input Sensitivity**
- 0.7 V RMS for full output
- Minimum load impedance:**
- 3  $\Omega$  continuous
  - 2  $\Omega$  intermittent (stereo or mono)
- Power Consumption**
- 200 W
- Power Output**
- Stereo mode:
    - 8- $\Omega$  load: 25 W RMS x 2
    - 4- $\Omega$  load: 40 W RMS x 2
  - Mono mode:
    - 8- $\Omega$  load: 80 W RMS
    - 4- $\Omega$  load: 140 W RMS

me with that impression. Like the SE-100 MK2s, orchestra strings are smooth and sweet without a trace of harshness. The soundstaging is superb. Once you've experienced separate mono amplifiers, you'll never go back to a stereo-power amp.

The SM-70 Pros perform at their best when operated as mono amps driven from balanced sources. When I reviewed

the Oppo BDP-95 Universal Disc Player (*audioXpress* January 2012), I mentioned trying the SM-70 Pros directly driven directly from the Oppo's balanced output. The ESS Sabre-32 DAC used in the Oppo has an internal 32-bit volume control, which is adjusted using the BDP-95's remote control. At the time I reviewed the Oppo, the volume control operated in rather coarse 5-dB increments, but

the most recent firmware upgrade to the player changes this to 1-dB increments. This makes the player ideal for driving a power amp directly if the digital player is your only source. The BDP-95/SM-70 Pro combination performs superbly, offering exceptional detail level, transparency, and soundstage reproduction.

## PERSONAL PREFERENCE

Making a decision between these amplifiers is difficult and will come down to personal taste and your specific listening requirements. If you have a true balanced source to feed your power amps and you prefer a tasteful amount of tube-like warmth in your sound, you should strongly consider the SM-70 Pro. But, if your source is unbalanced and your tastes tend to favor ultimate accuracy over what is admittedly a bit of euphonic coloration, the SE-100 MK2 will be your choice. Overall I'd rate the SE-100 MK2 as slightly more transparent, and the SM-70 Pro as slightly warmer. Either amp will provide hours of musically satisfying, nonfatiguing, high-end sound, at prices that continue Monarchy's high-value tradition. If you'd like to help the trade deficit, Monarchy is an American company, with its power amplifiers hand-assembled in its San Francisco, CA facility. These amps are highly recommended. *aX*

## EVALUATION EQUIPMENT

- Custom-built, belt-driven turntable with Grado signature tone arm and Grado Signature XTZII moving iron cartridge: *Audio Amateur*, March 1985 and March 1988; *audioXpress* July 2008
- Electronic power supply/speed control for the custom-built, belt-driven turntable (with recent upgrades): *Audio Amateur*, January 1986
- Audio Concepts Sapphire III loudspeakers and Sub-1 subwoofers with custom, all-polypropylene subwoofer-to-satellite crossovers: *Speaker Builder*, March 1991 and March 1995
- D.H. Labs Air Matrix interconnect cables (for unbalanced and balanced cables); D.H. Labs Q-10 loudspeaker cables, including bi-wiring for the Sapphire IIIs, and separate runs to the Sub-1 subwoofers: *audioXpress*, October 2002
- Custom-built pre-amplifier on Adcom GFP-565 chassis: *audioXpress* November 2003, December 2003, January 2004, February 2004, and December 2004
- D.H. Labs Power Plus AC cables with Marincio/Wattage connectors: *audioXpress*, February 2005
- Three PS Audio Power Plant Premier AC regenerators: *audioXpress*, April 2010
- Three dedicated AC power lines—one for each power amplifier and one for low-level equipment: *audioXpress*, January 2011; *Multi-Media Manufacturer*, July–August 2010
- Oppo BDP-95 Universal Blu-ray digital player: *audioXpress*, January 2012

## MEMBER PROFILE



Mark Driedger

**Member Name:**  
Mark Driedger

**Location:**  
McKinney, TX,  
north of Dallas

**Education:**  
Mark studied  
Electrical Engineering at Uni-

versity of Waterloo, Canada, graduating with a BSc and MSc. His graduate studies focused on communications and digital signal processing applied to speech.

**Occupation:** Mark worked in the telecom industry for 24 years. He spent the first 11 years in engineering and management roles building wireless base stations for the early digital cellphone systems. He is

currently a VP for a division of Tektronix, responsible for a large engineering, service, and manufacturing organization.

**Member Status:** Mark has subscribed to *audioXpress* since 2002. In 1977, he discovered *Elektror* at a local Canadian newsstand. Each month for the next five years, the newsstand put aside a copy for him. He said he spent many hours studying and building projects from *Elektror*.

**Affiliations:** Mark presently has no affiliations, although he is a past member of the Institute of Electrical and Electronics Engineers (IEEE).

**Audio Interests:** He is primarily interested in tube power amps, both for Hi-Fi and guitar.

**Most Recent Purchase:** Mark's most recent purchase was a USB DAC kit from

Hifidiy.com. He also bought a couple NAD solid-state power amps that he restored to power some outdoor speakers.

**Current Audio Projects:** Mark said he is working on a KT-88-based, tube power amp with an integrated USB DAC. He completed the power supply and output stages and he is working on the driver stages.

**Dream System:** Mark said he receives a lot of satisfaction listening to what he builds. So, his dream system would be the tube amp on which he is currently working, if/when he gets it finished! He uses a computer as a source, with all his CDs stored in lossless format. Mark said his dream system would also include a speaker upgrade from his PSBs—perhaps a pair of Focals. If he went with a commercial amp, he said he would choose a classic Marantz or Luxman tube amp. *aX*