

HIFI CRITIC



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Robert Koch Takumi K-70

HOW GOOD AND HOW PRACTICAL IS THIS EXCITING NEW HYBRID AMPLIFIER?

MARTIN COLLOMS



Robert Koch, self-taught engineer, retail entrepreneur and designer, came to maturity when associated with Hiroyasu Kondo, the respected exponent of high end Japanese valve amplifiers. Kondo's association with Audio Note over several years led to Robert spending time with Audio Note's Japan and UK divisions (the latter now independent). Robert had long held many design ideas of his own, and some time after Kondo's death in early 2006 he left Audio Note (Japan) and in 2008, taking his wife's surname, founded Robert Koch in Tokyo to produce his own exotic creations. The £35,000 *Takumi K-70* has been revised a little since its first introduction (we have the latest mid-2011 version), and has just been joined by a matching, non-remote *Takumi K-10* triode line preamplifier, which offers both balanced and single-ended operation.

Koch quotes renowned Class A designer Nelson Pass in his printed material, and I note that some flavour of Pass' published teaching has also spun itself into this Koch flagship we are reviewing. I also found a system illustration with a Wilson Audio *Sophia 3* on page 4 of the manual; coincidence or what?

This creation weighs 80kg in total, is built on three aluminium chassis and is finished in champagne-gold. Each *K-70* is hand made by Koch in a strictly limited twenty units a year. At heart it's a single-ended design with triode input/driver, and a single-ended Class A, solid-state output 'buffer'. Koch wished to combine the load drive imperturbability and consistency of the best solid state designs with the natural delicacy, dynamic expression and harmonic purity of low feedback single-ended triode technology. The three chassis format comprises two amplification channels plus a shared power supply, the sections linked by detachable umbilical cables that combine both low and high voltage supplies.

The WBT gold speaker outputs take wire, spade or 4mm plug connections. Normal voltage drive inputs are RCA-phono (single-ended) or XLR (balanced), selected by a locking lever switch which is matched via a plug-in octal base *Type 1933* balance transformer. For the alternative current input option into 50ohms loading an alternative transformer is required (available to order).

Technology

The Class A regime appears generous with up to 900W of continuous mains power input (450W per channel), for a specified "approximately 70W of undistorted output for 3 to 7 ohm nominal load factor". Note that it does not say 'per channel!' The heroic build is reminiscent of that famous Mark Levinson *ML20* Class A amplifier (20W/ch 8ohms, 40W into 4ohms), which drew some 400W standing.

Assuming the Koch is intended to stay in class A down to 6ohms at least, that's 110W x2, which at the textbook 25% efficiency is 450W per channel. It's a bridged design, with a single-ended direct coupled Class A amplifier on each side of the bridge, which is why it needs so little supply voltage. The output section has a pair of 33,000uF reservoirs, while the triodes get four 450V 560uF capacitors. Clearly, no chances have been taken with undersize power supplies.

The amplifier warms up well enough to sound quite good in about three minutes, and reaches full operating temperature and performance in about an hour. It should not be left on needlessly. DC potential is present on all speaker terminals due to its single-ended format though balanced output design. Special care is needed to make sure of firm cable connections and not to connect up when the amplifier is powered up. The voltage is not high (16.5V) but a stray connection to chassis could damage a loudspeaker. (Incidentally, quite a few class D amplifiers also have outputs at some DC

The System

Loudspeakers: Wilson Audio *Sophia 3*, Quad *ESL63*, BBC *LS3/5a* (15ohm), B&W *805 Diamond*, Franco Serblin *Kièma*. Amplification: Naim *SuperNait*, Krell *Evo402e*, Audio Research *Reference 5*, Music First Audio *Reference*, Townshend *Glastonbury Pre-1*, Naim *Superline/Supercap*. Sources: Naim *DAC*, MSB *Platinum Signature* and *Diamond* DACs, Marantz *CD-7*, Linn *Sondek LP12/Radikal/Keel*, Naim *Aro*, Koetsu *Urushi Vermilion*. Cables: Transparent *XL MM2*, Van den Hul *The First Audio*.

value relative to the chassis/ground.)

The *K-70* input may be configured in normal, ‘voltage mode’ (though the high impedance here is not all that high at a specified 30kohms, see Lab Report), or alternatively ‘current mode’ into a low impedance. It is a hybrid design, differential triode input stages, using selected RCA NOS type *5842* single triode valves, driving an array of no fewer than 32 output transistors per channel, specified for the highest gain stability, and mounted on massive thermally stable heatsinks, in order to protect the natural musical dynamics of the triodes.

The free standing power supply has dual mono build, with valve rectification and regulation for the triode amplifier sections, and massive *reactor* or choke input filtering for the solid state output stages. In view of the valve regulation, a delay of a few minutes is advisable after switching off before powering up again. A thermal safety trip is fitted to avoid possible overheating (perhaps caused by obstructed ventilation or if placed too near sunlight or a heat source). Wooden strip feet are part of a thermal design which allows free ventilation to the heatsinks. Additional vibration absorbing feet may also be used, as I found to advantage.

The manual notes that the power supply “may well purr along with the music”, an idiosyncratic comment, since it actually sounds like hum to you and me. It’s a function of the high standing power being filtered in the massive supply chokes, a particular feature of this amplifier and supply design which makes the active outputs primarily non-reactive in nature in order to present a more neutral drive to different speakers. Robert Koch informed me that more recent *K-70s* have adopted a quieter choke set, and future *K-70s* might use an encased, air gapped toroidal, potted for low vibration in an on-going effort to improve the noise level.

The *K-70* may be switched between 120V and 240V supply under instruction, using the dual in line (DIL) switches, and also the supplied substitute protection fuses. The power cables are safe and locking, but must not be disconnected or part connected with the power on as there are potentially hazardous voltages at the connector pins when exposed. The internal build is largely valve-style point-to-point wiring, with custom silver cables and special Litz multipath printed circuit tracks. Two top quality 600W R-core mains transformers are fed by that choke input section. The presentable specifications include an 0.07ohm output impedance 20Hz-20kHz, 25.5dB gain, 115dBA signal-to-noise ratio and a 5Hz-200kHz -3dB power response.

Sound Quality

From the beginning it was clear that this was no flaky specialist design, suitable only for use with full range horns or their ilk. Rather it’s a well specified, eminently usable and system-compatible amplifier, and one of exceptional merit too. All too often when a review amplifier is inserted, it makes my system sound

disturbed, even broken. Much reorganisation involving positioning and the matching of components, cables and filters may be required to extract a better balanced and more satisfying result. Not so with the *Takumi K-70*, whose slightly lighter tonal balance heard through my Wilson *Sophia 3* loudspeakers required only a small degree of extra toe out (about 5 degrees) to restore the preferred balance.

Beyond a pretty obvious audiophile performance, certain aspects of the sound quality might completely win over a listener. It has an exceptional sense of speed, grip and immediacy over the broad midrange. It’s both intimate and revealing, yet shows firm control of leading edges and portrays instrumental timbres very realistically. It’s undoubtedly upbeat and musical, conveying a superior sense of a live performance where appropriate. Depth, transparency and stage width started off very good, if a shade short of excellent, while the very stable and tightly grouped focus was indeed excellent. Depth too improved significantly to ‘excellent’ over the auditioning period. It was fun to audition and easily held one’s attention. That old classic *Jazz at the Pawnshop* (24/96 hi-res) was reproduced via the MSB *Diamond* DAC with exceptional clarity and atmosphere, the complex layered notes of the vibraphone solo sounding more vibrant, expressive and natural than before. It was essential that such an amplifier showed an exceptionally high standard of performance in order to make sense of its design story and high price; happily, it has succeeded.

There was of course that mechanical hum, and in this regard it was one of the louder amplifiers I have encountered, with rather more than just a ‘purr’. UK agent Amplitune explained that long power supply cables could be ordered if necessary, to move the supply away from the installation and the listening location (even placing it in another room if absolutely necessary). I’m not inclined to forgive mains hum, as I feel it impairs the operating signal-to-noise ratio and dynamic range, and also can colour low frequency reproduction. Fortunately I discovered that a weighted damper placed off-centre on the cover improved things substantially, while in any case the noise was not particularly harmonically focused.

Low frequencies are very good: percussive, deep and somehow uncontrived, though it does not quite have the full on bass power or tunefulness of my Krell *Evo402e*. On the other hand there’s also an impressive sense of single-ended triode musical vitality and simplicity, here coupled with the power and grip of a zero feedback yet low impedance voltage source, nicely synchronised with a very neutral, non-reactive yet powerful power supply. My overall score is an impressive 185 marks, which is true audiophile quality, and I am left with the impression of an amplifier which clearly reveals the differences between the natural and the contrived – the genuine acoustic and the digitally processed music production – and one which thrives

on subtle, complex material, which is reproduced with great verve and infectious musical excitement.

It was with the Franco Serblin *Kiéma* that my listeners really got the message. The startling realism of its grasp of tonal colour on acoustic instruments, the natural stop-start quality so apparent with violin, left the competition somehow seeming rather blurred, and at times caused listeners to catch their breath. Then there's the realistic brass, and the involving and exciting sense of musical performance, which is lively and purposeful. It played rather louder than the lab results would indicate, thanks to gentle clipping, and was happy coping with really difficult speaker loads, two factors that make up to some degree for what turned out to be a rather modest power output.

Lab Report

Running pure Class A with choke regulated supplies, the peak and continuous powers were the same, typically 40W per channel into either 8 or 4ohms, and with a reasonable 4A of peak current with very kind clipping. The power bandwidth was very good, as was distortion at all powers and frequencies, typically 0.01% (-80dB) or better. Channel separation was excellent and it has very easy input loading. High frequency intermodulation is also excellent, 0.01% even at full power.

The distortion spectrum was quite benign with second harmonic dominant. It was also very quiet electrically; I could hear nothing at the loudspeakers, and the figures confirm this: 107-108dB rel 40W with no hum, and 95dBa even at a low 1W power. Channel balance was excellent (within 0.225dB), and the frequency response was flat through the audio band, only reaching -0.4 dB at 8Hz. There was a strange rise at high frequencies above the audio band, averaging +8dB at 150kHz, allied to a clean, well damped overshoot on square wave drive. It behaved perfectly on reactive loads, and will therefore drive electrostatic speakers without problems. 1V input raises full power, so it is an easy input load after all (around 1Mohm), and will also match both passive controls and valve pre-amps well. Output impedance is typically 0.05ohm, giving consistent loudspeaker load matching

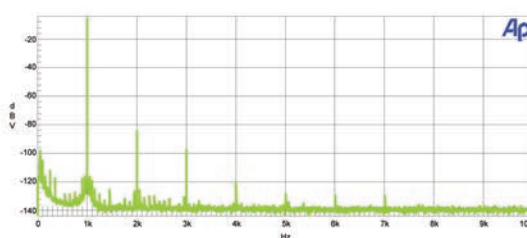
Conclusions

Undoubtedly a labour of love, Robert Koch has poured all his passion and many years of experience in audiophile amplification into this beautifully crafted, limited edition, made-in-Japan component. He believes that this is the best way he knows to deliver that highly desirable single-ended triode sound at realistic power levels and with competent load drive, such that the single-ended signature is consistently heard without any need for excuses. It is easy to drive and drives a range of loads well. It is fundamentally accurate, neutral in timbre, powerful, imperturbable and has an exceptional sense of natural musical energy, and lifelike

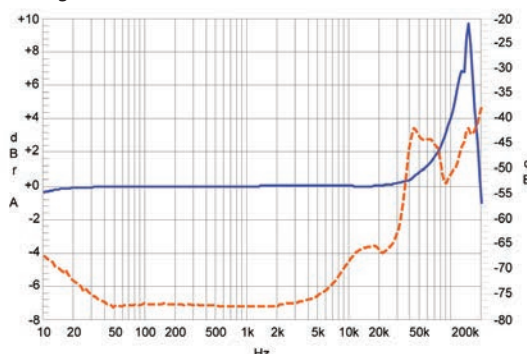
dynamic expression. No excuses need be made for its lab performance, which largely met the specifications and achieves a fine standard. Distortion and noise is very low and benign in nature, while the individual must satisfy him or herself concerning that sometimes moderately audible power supply 'purr' encountered on our sample. This remarkable creation demands audition and comfortably joins our select list of recommended great power amplifiers.



Takumi K-70 3W 8ohm distortion



Takumi frequency response, 1W 8ohm and distortion [orange]



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POWER AMPLIFIER TEST RESULTS

| | | | |
|--|---------------------------------|-------------------|------------------|
| Make Robert Koda | Date 3/08/11 | | |
| Model Takumi K-70 SN: 012A, 012B | Mains 240.5 V, Power input 760W | | |
| Power Output | 20Hz | 1kHz | 20kHz |
| Continuous 8 ohms, both channels | 41.5 W | 42.2 W | 38.2 W |
| Continuous 4 ohms, one channel | 42.0 W | 42.3 W | 41.1 W |
| Pulsed 2 ohms, one channel | - | 70 W | - |
| Output impedance (ohms) | 0.082 ohms | 0.044 ohms | 0.112 ohms |
| Peak Current (2ohms) | 4 A | | |
| Distortion, THD inc. noise (1W) | >-78 dB | -78 dB | -78 dB |
| Distortion, THD inc. noise (rated power) | - 82 dB | -81 dB | -60 dB |
| Channel separation | >120 dB | >105 dB | >80 dB |
| Intermodulation Distortion 19.5kHz/20.5kHz 1:1 rated power, 8 ohms | -81 dB | | |
| Intermodulation Distortion 19.5kHz/20.5kHz 1:1 1W, 8 ohms | -93 dB | | |
| Signal to noise ratio (ref. 1W output) | CCIR Weighted | Unweighted | A-weighted |
| Aux (Bal) | 91.5 dB | 90.5 dB | 95.1 dB |
| Full Power | 108 dB | 107.5 dB | 110 dB |
| Channel Balance | 0.225dB | | |
| Frequency Response | +0 - 0.35dB 10Hz to 30kHz, +8dB | | @ 150kHz |
| Absolute Phase | Correct | | |
| Input Data | Socket | Sensitivity (40W) | Loading (approx) |
| Input single ended | Phono/RCA, XLR | 1V | 1M ohms -100pF |
| DC offset | L 30.5 mV | R 29.5 mV | |
| Size WxHxD | 380mm | 256mm | 500mm |
| Weight | 40kg PSU | 20kg L | 20kg R |
| Finish | Satin gold anodised | | |
| Price | £35,000 | | |