

# SAC Glow Master Series GM-70

## Pure Class-A Monoblock Single Ended Parallel Power Amplifier



The new GlowMaster GM-70 is a large format monophonic power amplifier employing parallel vacuum tubes on its output stage running in pure Class-A to deliver the best quality of 70 watt/RMS of pure Directly Heated Triode characteristic power.

Each monobloc is equipped with two Russian NOS GM-70 vacuum tubes working in parallel SE Class-A. This vacuum tube is originally designed to be used in the military environment thus having extremely linear and durability characteristics when used in audio amplifier. Its massive anode structure with heavy glass envelope reduces unwanted vibration or microphonic that is usually associated with other types of vacuum tube. By successfully building several custom made GM-70 SE amplifiers with one tube, SAC decided to reach further and higher for the completion and the perfection in the design of cost no object apparatus to withstand the test of any other challengers. The parallel configuration of GM-70 tubes appeared to be the best answer and to outperform one tube, works need to be done from all aspects of the design and implementation. Starting from newly development of SILK Super Output Transformer (SILK model S-3000GM70) to allow the two tubes configuration to work in ideal condition without degradation in harmonic or frequency characteristic over smaller output transformer. This task required a unique winding technique and this evolved from several trial and error experiments in the developing this. Although the transformer must withstand a voltage swing close to thousand volts and the heavy current generated by two tubes, the outcome is an amazing large scale output transformer with 1,000watt power reserve that has a bandwidth close to 80KHz with very low distortion and constant impedance throughout its working range. This allows the two tubes configuration to work successfully.

By having the solution with the best output transformer, next development is to design and build the best power supply section to feed both power hungry tubes with lowest impedance. Eight 1.5KVA Super Diodes work together with massive 1.3KVA hand-wound power transformer with special electro-magnetic shield to help ensure sufficient current supply when the load is at its most severe. The supply filter section comprises of audio grade large type filter capacitors and DC choke filter that block all noises from the rectifiers to get into main audio circuit. Additional low voltage separate power supply section is built around a naturally soft start vacuum tube rectifier (5Y3) with classic Capacitor-Choke-Capacitor configuration. This power supply section feeds the input and driving circuit directly thus completely eliminates any power drop off during maximum peak current drawing from the output tubes. These two power supply sections improve the sounding performance of the amplifier to the next level. The input and driving section: Only the best vacuum tube and circuit are selected to work in this section as it is one of the most critical element to determine the sound of the amplifier. GlowMaster GM-70 has special NOS 6N1P dual triode vacuum tube to work as input tube generating precise and natural sonic signature with unparalleled clarity and dynamic range extending beyond ordinary tube amplifier. The driving section forms a solid backbone of the amplifier since it needs not only to supply pure a signal, but also very high driving force to meet GM-70 extreme requirement. Only NOS 6BL7 large size medium mu twin triode in special anode choke loaded circuit can meet such demand of GM-70 to produce this extraordinary sounding amplifier.

**Acoustic Perfection – Ely, Cambs. CB6 3SJ**

**Tel: 0845 166 8364 e-mail [sales@acousticperfection.co.uk](mailto:sales@acousticperfection.co.uk)**

Acoustic Perfection is a trading division of Applied Business Solutions Ltd, PO Box 148 Wilburton, Ely Cambridgeshire, CB6 3RZ, Company registration 4688618.

Making a good power amplifier is not easy, maintaining one to perform at its best throughout its service life is even harder task. The GlowMaster GM-70 has a simple solution with its real time current indicator on the front LCD display to observe the bias status of the output tubes assuring perfect working operation.



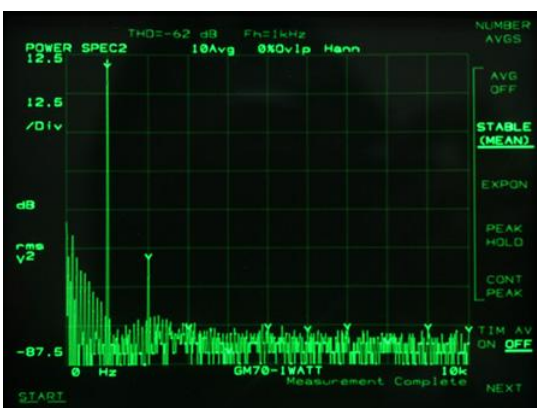
Also located at both sides of the chassis near GM-70 tube are the bias adjustment pots which enable user to respond to any deviation in bias without having to flip the heavy amp over to make such bias adjustment inside the chassis.



Inside each monobloc you'll only find the art of know-how in selecting parts to compliment each other developing great natural sound and the master craftsmanship of point to point hard wiring, layout in very elegant and simple appearance yet provide simple maintenance and minimize sonic degradation. Not only the SAC GlowMaster GM-70 sounds very good, but it has good characteristics and measured evidence to back this up. Here is a result of extensive research and non-stop development to build the better sounding machine. The true dedication and determination are reflected in each of the SAC products.



## TEST REPORT



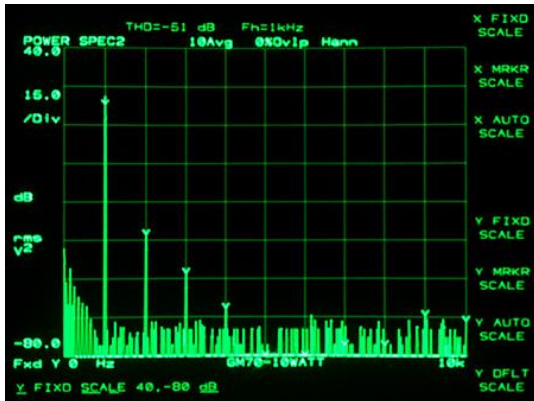
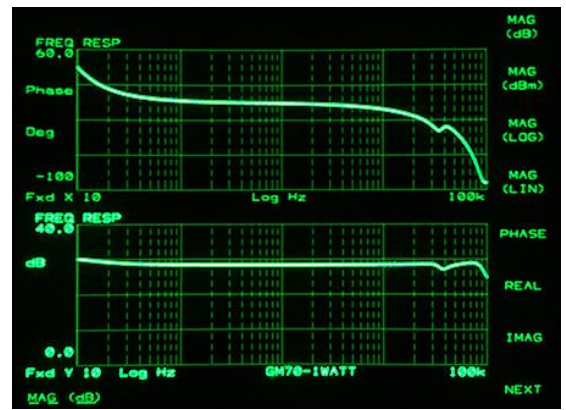
Real total harmonic characteristic measured at 1 watt (the most important watt, many people believe) As can be seen here, only second harmonic dominate the spectrum and its level is very low (-62dB or THD of 0.079%). This is much lower than any other single ended amplifier.

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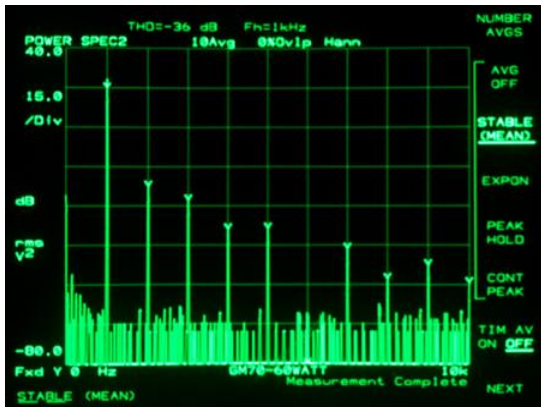
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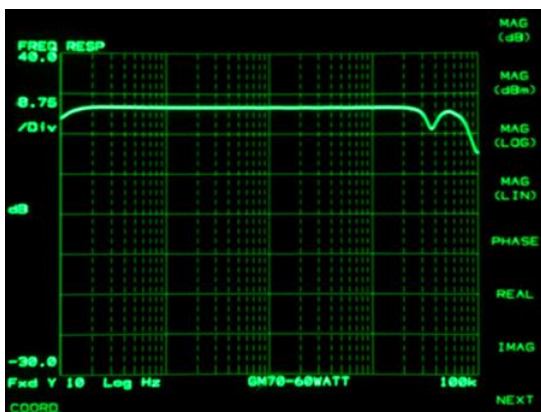
This trace depicts frequency characteristic measured at 1 watt RMS. Top curve is phase angle which has a smooth transition from 20hz to 20KHz. The lower curve is frequency response and it is almost flat from 10Hz to 30KHz while having small dip at around 40KHz, the total bandwidth is still reach further to +70KHz. It is evident that this SE amplifier outperforms many push-pull amplifier or even solid state in bass frequency response.



At 10 watt RMS, the total harmonic distortion is still very low at only -51dB (0.28%) Second harmonic distortion dominates the spectrum with small third harmonic and fourth harmonic elements.



At a power output of 60 watt RMS, the harmonic distortion is still lower than most other single ended amplifier. At -36dB (1.58%) with majority of harmonic spread out in second, third, forth and fifth in decade, it is still very difficult for even well trained listener to detect such distortion since it will still appear to be more pleasing. Also it is unusual for most listeners in any circumstance to encounter such a high sound pressure level



At 60 watt RMS, the frequency response is still flat from 20Hz to 30,000Hz.

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## SPECIFICATIONS

Product Type:	Monophonic Vacuum Tube Power Amplifier
Input Tube:	6N1P
Driver Tube:	6BL7
Output Tubes:	Ulynov GM-70 x 2
Output Power:	70 watts/CH pure class A, 100 watts peak power
Frequency Response:	5-70,000Hz (-3dB) at 1 watt 20-30,000Hz at -3dB at full power
Input Sensitivity:	0.96V for full power output
Overall Gain:	28dB
Negative Feedback:	Moderate 6dB (can be special ordered with zero feedback)
THD + noise:	Less than 0.08% at 1 watt RMS, Less than 5% at rated power
S/N ratio:	below 88dB
Size:	(W) 33 x (D) 56 x (H) 28 cm.
Weight:	Approx 35 kg.

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