

## **REFINEMENTS**

### **Upgraded Walsh A, F, and New TLS Series Speakers**

The Following is a partial list of upgrades and improvements that are incorporated into the rebuilt Ohm products and are standard on the new Walsh "Style" TLS series speakers.

- 1) New higher temperature (300 deg. C) voice coils, edge wound aluminum with reduced weight of around 3.9 grams.
- 2) Voice coil properly centered in the magnetic gap for a true under-hung design and increased efficiency. Approximately 89 db for 2.83 volt input at 1 meter.
- 3) Voice coil nominal impedance increased from 4 to 6 ohms for the F and TLS-1.
- 4) Magnets fully charged and balanced from pair to pair for 9,800 gauss nominal in the gap. Still 2.1 lb. (33.6 oz) Alnico V-7 slugs and 10.25 lb. (164 oz) magnetic motor assembly.
- 5) Improved magnetic shielding and reduced magnetic energy losses.
- 6) Complete copper shorting rings and caps added to all magnetic motor assemblies for reduced eddy current and inductive losses. Less tendency for compression losses.
- 7) New cones made from scratch here at HHR Exotics. Hand assembled and hand toleranced . Each cone is also balanced within practical limits.
- 8) New longer life internal damping foams used throughout.
- 9) Reduced overall cone weights. Reduced voice coil assembly weight.
- 10) New longer life elastomer foam surrounds for proper cone termination and support.
- 11) Cardas Gold banana binding posts or equivalent re-machined by HHR Exotics to produce a very high quality, non oxidizing banana plug connection directly at the driver assembly. Not through the cabinet base via. inexpensive plastic binding posts and 18 gauge hook-up wire.
- 12) New silver Litz wire cone leads.
- 13) Expertly refinished or newly crafted cabinetry with hand rubbed exotic hard wood veneers. Request a list of woods available or ask for a custom wood.
- 14) Newly developed internal stair-step cabinet bracing for significant reduction of cabinet induced resonance. The old cabinets had a tendency to "sing" coloring output response.
- 15) New internal cabinet wall damping materials added to control standing waves and resonance.

- 16) Newly designed cabinet base structure made from hardwoods and designed to accept 4 high quality 3 piece machined cone spikes to couple speaker to the floor. This improvement alone is dramatic, cleaning up the bass response and adding transparency to the midrange and top end.
- 17) Refurbished or new built grilles and grille covers offer protection and transparency for the drivers.
- 18) Complete speaker weight from 110 lb. for your rebuilt F's and up to 150 lb. for TLS-I. 150 to 180 lb. for rebuilt A's and TLS-II.
- 19) Drivers fused for protection using standard AGC fuses.
- 20) All solder connections made with high grade Silver Solder.
- 21) For best performance, recommend use of high quality Oxygen free Copper ribbon wires and or high quality audio cables for connection to the speakers and amplifiers(s).
- 22) Driver bases modified to accept 4 bolts with "O" Ring seals to maintain a sealed cabinet enclosure.
- 23) Magnet structure has been damped with foam and high density damping materials.
- 24) New TLS series cabinets made from very stiff laminated Birch ply wood 2" thick.
- 25) (Optional) Internal walls of cabinets have ½" thick Granite slabs attached to prevent vibration and resonance.
- 26) Voice coils designed with ventilation holes to provide cooling and reduce weight. This results in less thermal load and less compression effects.
- 27) Magnet assemblies designed with air breather holes for reduced thermal load.
- 28) New style gasket materials used between the driver base and cabinets.
- 29) ½ round ribs added to magnet support assemblies to facilitate wave propagation and lessen reflected sound.
- 30) Use of additional damping materials on magnet support structure to reduce ringing.
- 31) (Optional) Newly designed more transparent grille covers for protection without obstruction.
- 32) Redesigned driver bases made from various hardwoods and aluminum.