

GRAY 206-S 12" PROFESSIONAL STEREO TONE ARM FEATURES



GRAY

RESEARCH AND DEVELOPMENT CO.

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FEATURES

Gray's goal while developing the 206-S was to minimize — to the vanishing point — the effect of a tone arm on reproduced sound while maximizing the number of distortion-free plays that could be obtained from a disc. No attempt was made to limit these stringent requirements to present-day records. All discs produced during this century ranging from $16\frac{2}{3}$ RPM to 85 RPM, including all known groove configurations — microgroove, standard, vertical, lateral and stereo — were included within the scope of the project.

The 206-S is viscous damped and this damping plays a key role in its performance. Ideally, when a stylus vibrates due to the musical tones in a record groove, a tone arm should stand perfectly still. But when the stylus is moved towards the center of a record by the spiraling action of the grooves, the tone arm should offer no resistance. Silicone fluids tend to resist motion when they are moved rapidly, but have an insignificant amount of resistance when they are moved slowly. Because of viscous damping, the 206-S stands still when the stylus is moved rapidly but can still spiral freely toward the center of a record.

Tracking error, which occurs because records are mastered with a cutter mounted on an overhead track but played back with an arc motion mechanism, was brought under control by analyzing the potential offset angles of tone arms, the groove velocity of records at various radii, and the statistical probability of any given record size being played more frequently than

ADDITIONAL FEATURES

ULTIMATE RELIABILITY — is assured by the combination of a single moving part on a single bearing. The ruggedness of this mechanical system is such that a hammer blow would be required to knock it out of adjustment.

MICROMETER DAMPING ADJUSTMENT — is provided by a small knob directly over the pivot bearing. This adjustment can be made quickly and accurately.

AUTOMATIC MEMORY — whenever a slide assembly is plugged into the 206-S, the following variables can be automatically provided for to give optimum performance.

■ **LATERAL BALANCE** — so that all cartridges regardless of their center of gravity ride level in the tone arm.

■ **VERTICAL BALANCE** — so that each cartridge will track at its exact specified pressure within $\frac{1}{2}$ gram or in special cases to $\frac{1}{8}$ of a gram. The range of adjustment is such that almost all

others. All three variables were then expressed mathematically and an offset angle chosen for the 206-S which results in a minimal tracking error.

Since the magnitude of the distortion due to tracking error is inversely proportional to disc radius, this already low tracking error was then adjusted so that the minimum value occurs in the sensitive low velocity inner grooves and the maxima occur at points of higher groove velocity where they have no audible effect.

Tone arms are subjected to stress vertically, laterally, and torsionally and must be stabilized in all these planes. In the 206-S, all of these balance adjustments plus bearing pressure, and tracking force are controlled by gravity and are fully adjustable by the user for each cartridge — individually and permanently — so as to give maximum possible performance.

In addition, because recorded discs have information on them not only in the vertical or lateral direction, but at all possible angles in between, arm resonance has been controlled for all modes of vibration. To accomplish this, the sandcast body of the 206-S is designed to prevent any spurious discontinuities above the primary resonance of the moving system itself as related to the compliance of the cartridge used.

Finally, the geometry of the single bearing, ball and socket viscous damping structure has been adjusted to effectively eliminate the fundamental arm resonance.

commercially pressed discs ever made can be played at the proper tracking pressure when a cartridge with their specific stylus size is plugged into the arm.

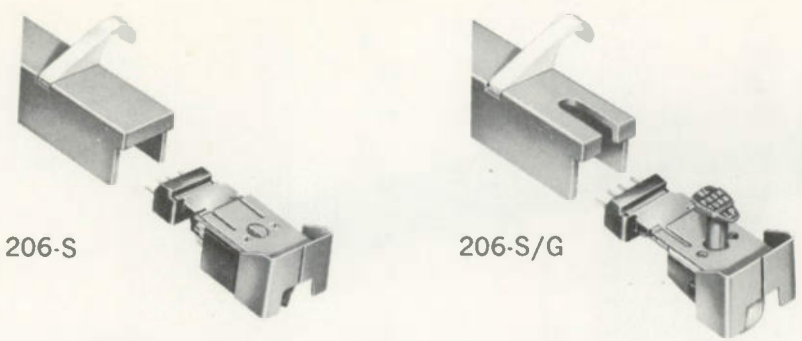
■ **OVERHANG** — so that the variation in stylus to mounting center distance in non-standard cartridges can be adjusted for minimum tracking error.

■ **CARTRIDGE OUTPUT** — so that a variety of electrical characteristics can be matched to a single preamplifier stage.

DUAL BALANCED LINE — operation is standard for Broadcast applications with the wiring supplied with the 206-S. This will be of particular interest to radio stations anticipating stereo broadcasting.

SPECIAL MODEL — the 206-S/G is available for stations wishing to use the turnaround G.E. Broadcast cartridge, along with other types.

You owe it to your station's reputation to transmit the best in sound. Try Gray today.



206-S

206-S/G

GRAY 206-S 12" PROFESSIONAL STEREO TONE ARM SPECIFICATIONS



Gray's new professional 12" stereo tone arm is available in two models that are identical in performance. The model 206-S comes with a slide and modular weights for mounting single play stereo or monophonic cartridges.

The model 206-S/G has a special slot cut into the front of the tone arm to clear the stem of a G. E. turnaround cartridge allowing plug-in operation, and comes with specific hardware for this application.

Accessory slide kits are available to the Broadcaster for multiple cartridge operation.

The 8-S accessory slide assembly includes the cartridge slide, modular weights, mounting hardware and compressible spacers for the installation of stereo or monophonic single play cartridges. The model 8-S slide assembly with cartridge mounted is usable in either the 206-S or 206-S/G interchangeably.

The 8-S/G accessory slide assembly is specifically designed to mount the G. E. turnaround cartridge. With this cartridge installed, it will only fit the 206-S/G arm; however, cartridges are interchangeable between arms in this model.

A complete stock of spare parts for the 206-S and 206-S/G 12" is maintained by Gray's Service Department.

WEIGHT:
 3 lbs. 10 oz. } Packed
 1.85 kg. }
 2 lbs. } Unpacked
 .95 kg. }

DIMENSIONS:
 2 3/8 in. high, 12 3/4 in. long, 2 3/8 in. wide. (Unpacked)
 6 cm. high, 32.5 cm. long, 6.7 cm. wide. (Unpacked)
 4 1/2 in. high, 16 1/2 in. long, 4 1/2 in. wide. (Packed)
 11.5 cm. high, 42 cm. long, 11.5 cm. wide. (Packed)

OVERHANG:
 0.682 in. } Spindle center to
 17.3 mm. } stylus

PIVOT TO SPINDLE:
 8 3/4 in.
 21.1 cm.

PIVOT TO BACK OF ARM:
 3 3/8 in.
 8.6 cm.

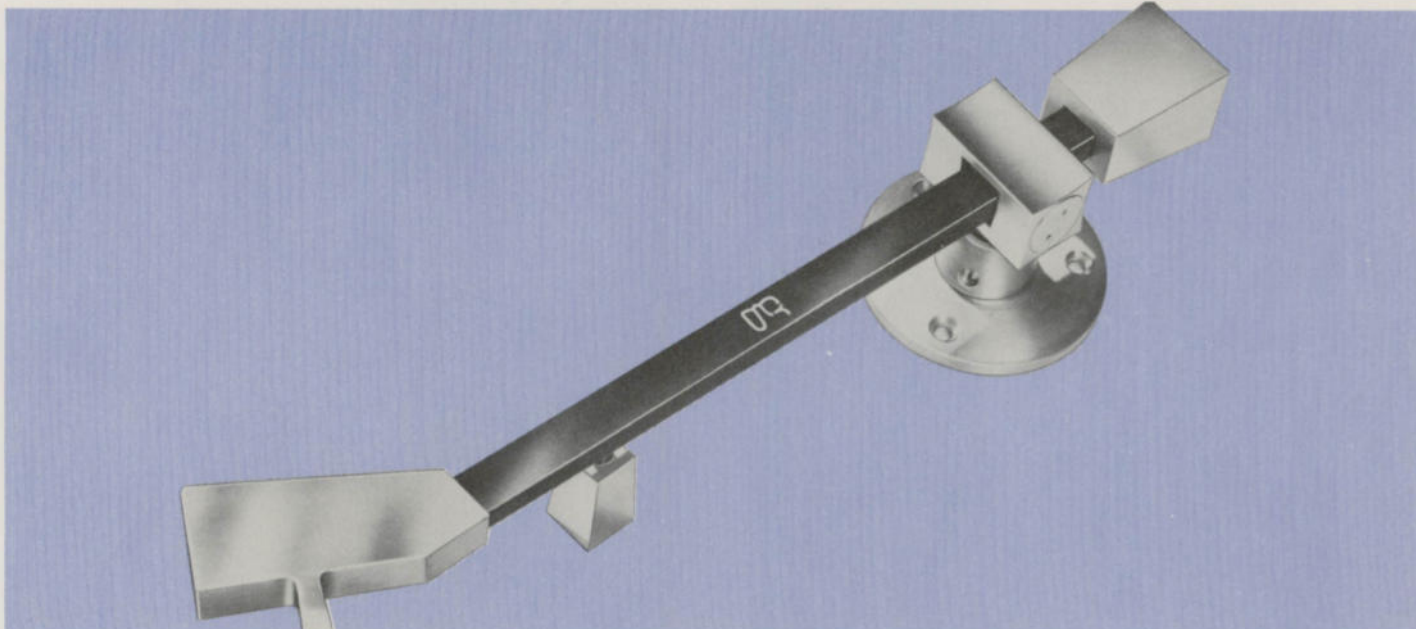
RESONANCE:
 Vertical 15 cps. } At 4 gms.
 Lateral 15 cps. } tracking force
 /5 x 10⁻⁴
 cm./dyne.
 compliance

TRACKING ERROR:
 3.0 in. radius 0° 0'
 3.75 in. radius 1° 28'
 4.75 in. radius 0° 0'
 5.5 in. radius 2° 0'

ARM RESPONSE:
 ±1 DB from 5 cycles to top end limit imposed by cartridge used.

You owe it to your station's reputation to transmit the best in sound. Try Gray today.

MODEL 306 MICRO-TRAK® 16" PROFESSIONAL TONE ARM



"Micro-Trak"®—A term created by Gray's Research Team to properly name the finest professional tone arm series ever created.

With proper tracking capabilities as low as 1/10 gram, resonance less than 10 Hz and the greatest possible reliability: What other product could be considered by the professional user.

The impregnated wood body, laminated for high

strength, the plug-in memory balancing head, the sapphire jewel bearings for virtually frictionless vertical rotation, the fluid anti-skate mechanism, the rugged simplicity all contribute to make the "Micro-Trak"® series the best buy available today.

Whether you relate in dollars per operating hour or in highest transduction quality, you have it all with "Micro-Trak"®.

THE GRAY LINE OF FINE BROADCAST INSTRUMENTS

Model 808/810	Broadcast Equalizers
Model 602	I.M.P. Impedance Matching Preamp.
Model 206	Viscous Damped Tone Arm
Model 208	Viscous Damped Tone Arm
Model 1012A	Professional turntable

MICRO-TRAK® SPECIFICATIONS 306 16" PROFESSIONAL TONE ARM

Dimensions: 14-5/8" overall (37.15 CM)
8-5/16" spindle to pivot (21.11 CM)
3" from pivot to back of arm (7.6 CM)

Weight: 1.25 lbs.

Overhang: 0.5333" spindle center to stylus (13.5 MM)

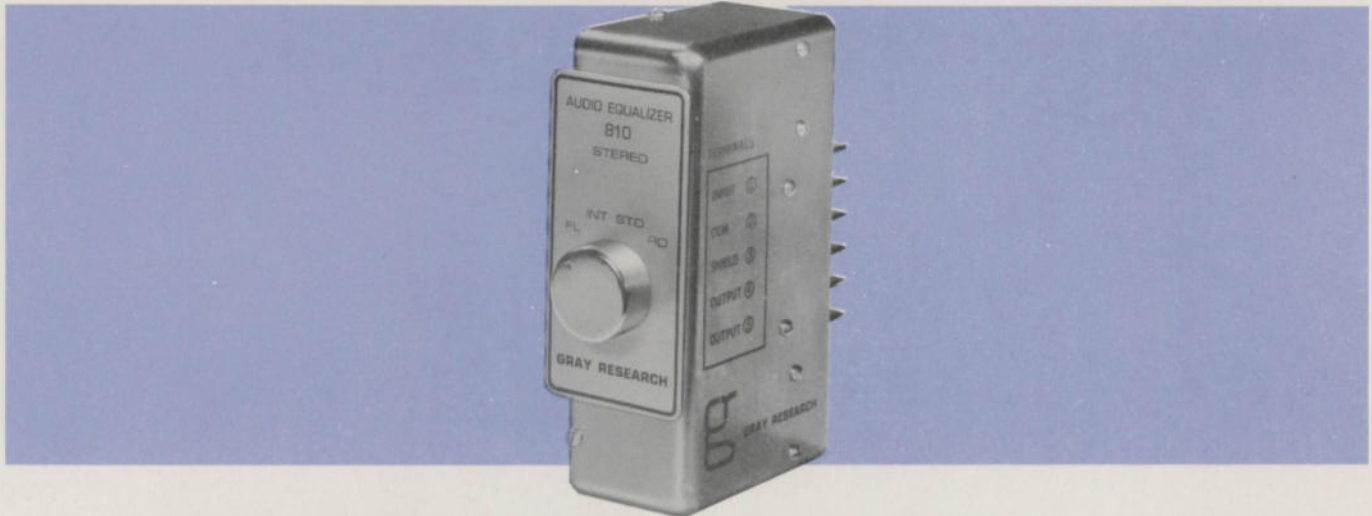
Resonance: Less than 10 HZ 1/2 Gram at 30×10^{-6}

Tracking Error: 3.0 in radius 0° 0'
3.75 in radius 0° 53'
4.75 in radius 0° 0'
5.5 in radius 1° 15'

Micro-Trak® is also available in a shorter version for 12" turntables, for EMT turntables, and in special lengths for custom table sizes.

PRICE: \$82.50 USER NET

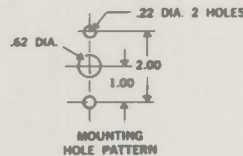
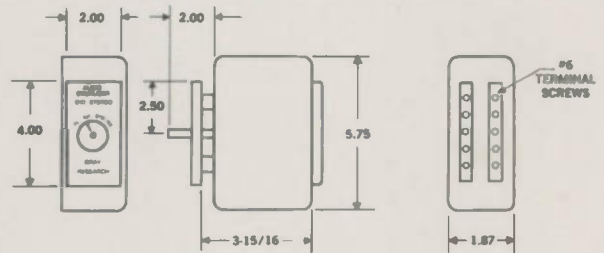
MODEL 810-A BROADCAST EQUALIZER
STEREO INPUT - STEREO OUTPUT



This new passive professional broadcast equalizer offers the finest possible performance from high impedance stereo broadcast cartridges with your present stereo console. It has been designed to offer the same four equalization curves as the familiar Gray 602-C in a package half the size.

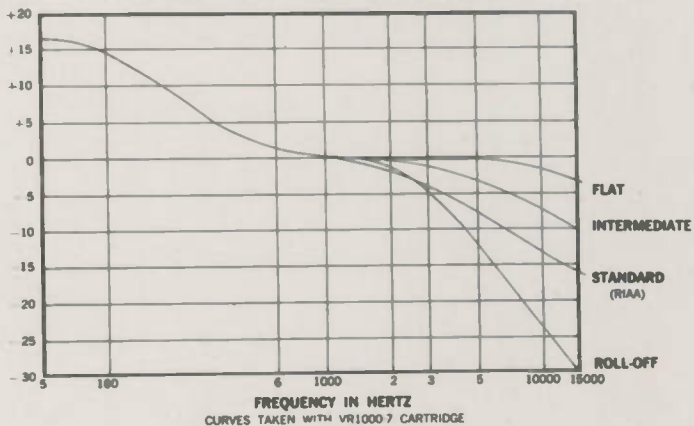
Perhaps you thought the only way to handle this high impedance problem was with an equalized pre-amp. Not so . . . Gray's long experience with passive equalization devices has been applied to bring you a trouble free passive unit which requires no power source and has no, troublesome, active circuitry to maintain. Input it to a 50, 150 or 250 OHM microphone channel and forget it.

Although specifically designed for use with the VR-1000 Broadcast Cartridge, the 810-A is also suitable with other types. Compare the cost of this unit with the cost of an active equalized pre-amp offering the same output curves and you will be pleasantly surprised.



MECHANICAL DATA

FREQUENCY RESPONSE DATA



Specifications: 810-A Equalizer

INPUT: 47000 OHM Stereo Cartridge
 (2 Separate Channels)

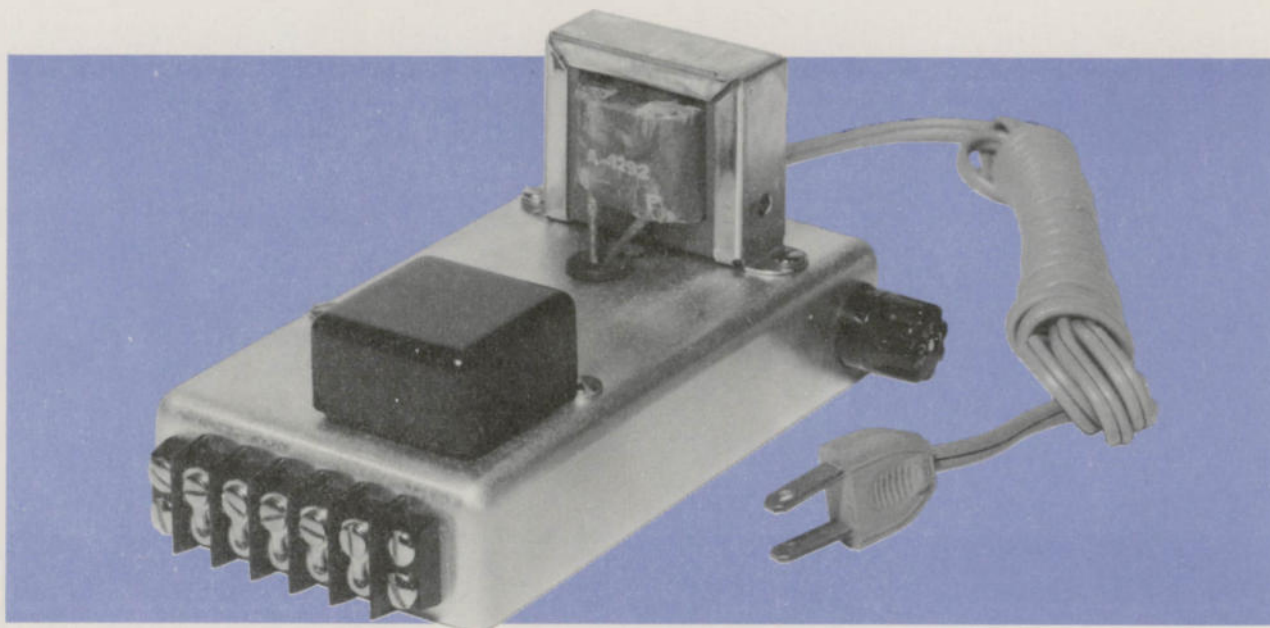
OUTPUT IMPEDANCE:
 150 OHMS — Supplied
 50 OHMS } Avail. Internally
 250 OHMS }

OUTPUT CHANNELS: Two (2)

OUTPUT LEVEL: —61 DBM with 5 MV Input
 at 1000 HZ (Each Channel)

PRICE: \$97.50

MODEL 602-I.M.P. IMPEDANCE MATCHING PRE-AMPLIFIER



A new solid state pre-amp, complete with its own power source, designed to allow the proper impedance between the new stereo cartridges and Gray's 602-C broadcast equalizer or similar passive equipment.

The 602-I.M.P. provides an output level of -67 VU @ 35 c/m second. Distortion is less than 0.5% with 20 MV input. Noise, below -70 dbm . . . truly professional performance.

This outstanding performance is made possible by Gray's recently developed FET solid state amplifier module, and a unique variable impedance transformer.

The engineer faced with stereo cartridge to monaural channel problems can solve them quickly with the new 602-I.M.P. at approximately one half the cost of a new equalized pre-amp and still continue to use his long proven passive equalization techniques.

THE Truly Professional LINE OF FINE BROADCAST INSTRUMENTS

- The 303 12-inch Tone Arm—*micro-trak*
- The 306 16-inch Tone Arm
 - The 206 12-inch Tone Arm
 - The 208 16-inch Tone Arm
- The 602-C Broadcast Equalizer
- The Telop — The Telojector

602 I.M.P. SPECIFICATIONS

INPUT POWER: 115 VAC to internal power supply

INPUT: 47,000 OHMS

OUTPUT LEVEL: (with 602-C Equalizer)
 -67 vu @ 3.5CM/second

DISTORTION: Less than 0.5% 20 MV input

NOISE: -70 DBM at output

PRICE: \$59.75 USER NET