

V15 type V

TOTAL TRACKABILITY INDEX TEST RECORD

When you purchase a V15 Type V Cartridge and return your registration card, we will send you a copy of the new Shure TTR117 Trackability Test Record. It is a milestone achievement in test records specifically devoted to evaluating high fidelity phono cartridges.

FULL ONE-YEAR WARRANTY: Shure Brothers Incorporated ("Shure"), 222 Hartrey Avenue, Evanston, Illinois 60204, warrants to the owner of this product that it will be free, in normal use, of any defects in workmanship and materials for a period of one year from date of purchase. You should retain proof of date of purchase. Shure is not liable for any consequential damages. If this Shure product has any defects as described above, carefully repack the unit and return it prepaid to:

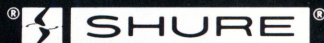
Shure Brothers Incorporated
Attention: Service Department
222 Hartrey Ave.,
Evanston, IL 60204, U.S.A.

If you are not in the United States, return the unit to your dealer or Authorized Service Center for repair. The unit will be repaired or replaced and returned to you promptly, and if it cannot be repaired or replaced, you may elect to receive a refund. This warranty does not include stylus wear.



Shure Brothers Inc.,
222 Hartrey Ave.,
Evanston, IL 60204, U.S.A.
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the V15 type V
a step beyond
extraordinary

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the V

This exceptional new cartridge represents a quantum leap forward in phono cartridge performance. It brings together a sophisticated array of important new construction features, performance capabilities, and high technology instrumentation. The result is refined sound reproduction designed to give unequaled listening pleasure... listening pleasure that goes a step beyond even that of the world-renowned V15 Type IV. The V15 Type V not only re-creates the music, it brings back the emotion of the performance!

*the V15 type V...
a step beyond
extraordinary*



Only the

V

15 Type V offers all these outstanding features and benefits:

- Beryllium MICROWALL/Be™ stylus shank results in superior trackability for more accurate sound reproduction.
- MĀSAR™ polished Hyperelliptical stylus tip reduces record wear and distortion.
- High efficiency magnetic structure for the ultimate flat frequency response.
- Dynamic Stabilizer/Destaticizer overcomes record warp, dust, and surface static electricity.
- Exclusive SIDE-GUARD stylus protection system guards against accidental stylus damage.
- The highest known trackability at 1 gram for extended record and tip life.
- Precision instrumentation for the critical alignment of the stylus to the record.
- Individually serialized; each cartridge supplied with a serialized printout of its individual performance.

total trackability

Trackability is an important concept introduced by Shure to bring into focus the primary requirement a phonograph cartridge must meet in playing today's recordings. Simply stated, Trackability is a measure of the stylus' ability to stay in contact with both groove walls. Total Trackability expresses the demand for a cartridge to cope with signals over the entire frequency range. Low, mid, and high frequencies each place different requirements on the phonograph cartridge, yet all must be simultaneously satisfied if high level complex signals are to be accurately tracked.

Of all signals, the most demanding requirements are often due to the high frequency tracking challenge of high pitched sounds and sharp transients. The challenge of tracking high frequency signals is at least as important for accurate reproduction as is the tracking of low and mid frequencies. In addition, mistracking of any signal results in record groove damage. Until now this challenge has not been met.

The V Meets The Trackability Challenge



MICROWALL/Be™

Beryllium MICROWALL/Be Stylus Shank and New Hyperelliptical Tip... Combined For Lowest Effective Mass Ever!

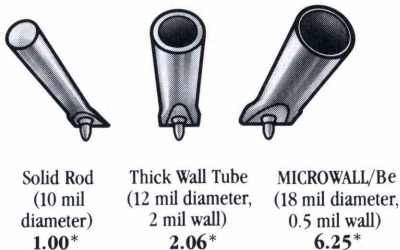
Beryllium is the ideal material for a stylus shank due to its extreme light weight and high rigidity. These ideal properties can only result in superior performance when the material is structurally optimized. Shure has developed a unique process for forming a 0.0005 inch Beryllium ultra-thin walled tube, resulting in the lowest effective mass of any stylus shank ever. This unique stylus construction is called MICROWALL/Be.

The measure of a stylus shank's capability is the stiffness to effective mass ratio of the structure called the Shank Performance Ratio, with higher ratios indicating better performance. The advan-

tages that can be realized through the use of a thin-walled tube such as the MICROWALL/Be are illustrated at lower left.

The truly important Shank Performance Ratio represents the combination of material properties together with the structural advantages that geometry can provide. While materials may have a high stiffness and/or low mass, until now processes have not evolved to take full advantage of the geometric factors that provide the performance of a shank with a high stiffness to mass ratio. The MICROWALL/Be shank incorporates both material properties and structural principles to yield the highest known Shank Performance Ratio, resulting in unprecedented high frequency trackability.

Cross Sections of Beryllium Stylus Shanks



Nearly doubles high frequency trackability

Nowhere is improvement in Trackability more essential than in the high frequency range, above 5 kHz. When the V15 Type IV was introduced, it set an industry standard by tracking a 10 kHz tone at 37 cm/sec.** The V15 Type V, with its low effective mass MICROWALL/Be shank, almost doubles this, with Trackability at an incredible 60 cm/sec.** In practical terms, this means there is almost nothing put onto records that the Type V cannot track accurately, including the "hottest" signals of today's Super Discs. It marks the biggest leap forward in Trackability since the introduction of the V15 Type II—all at an optimum stylus force of one gram.

** Peak Velocity

* Shank Performance Ratio: stiffness/effective mass, relative to a 10 mil diameter solid rod.

The V Meets The Trackability Challenge

Ultra-flat frequency response

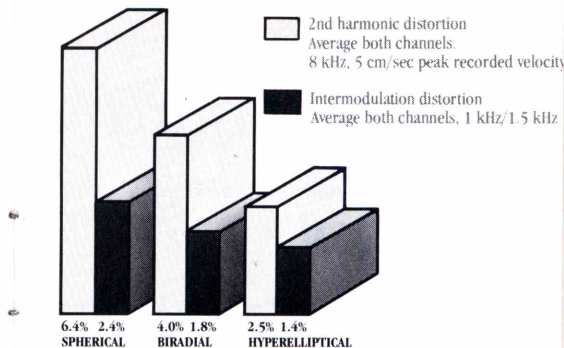
Previously, in order to achieve ruler-flat frequency response, compromises in performance were required. The effects of the stylus mechanical resonance in the audio band required compensation in the electrical system. With the V15 Type V MICROWALL/Be shank, however, the stylus mechanical resonance frequency has been raised to 33 kHz, well beyond the audio range; *this represents a 50% improvement over the V15 Type IV*. It assures flat response, as well as greater and more uniform high frequency channel separation.

Improved vertical tracking angle

Because of the extremely light weight and stiffness of tubular thin-wall Beryllium, it was possible to increase the length of the V15 Type V shank while simultaneously achieving a reduction in effective stylus mass. The increased length results in decreasing the vertical tracking angle for a better match to the record groove and lower distortion. Because vertical tracking angle varies with tracking force, it is necessary to design for a specific tracking force to achieve a controlled vertical tracking angle. Shure has therefore designed and specified the V15 Type V for 1 gram tracking force.

Improved MĀSAR™ Polished Hyperelliptical stylus tip

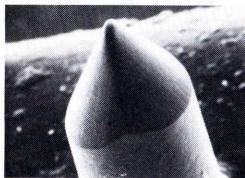
The V15 Type V includes an improved version of the highly acclaimed Hyperelliptical nude diamond tip configuration that won high praise for its contri-



butions to reduced harmonic and intermodulation distortion. Its footprint is longer and narrower than the traditional Biradial (Elliptical) tip-groove contact area. Because the Hyperelliptical footprint geometry is narrower than both the Biradial and long-contact shapes such as the Hyperbolic, it is pre-eminent for reproduction of the stereo-cut groove. In fact, as a result of the optimized contact area of the Hyperelliptical tip, both harmonic distortion (light bars in graph) and intermodulation distortion (dark bars) are dramatically reduced.

The mass of the nude, gem-stone quality diamond tip of the V15 Type V is approximately half that of the V15 Type IV. Its cylindrical stem allows uniformly precise orientation of the contact surfaces to the stylus shank (not necessarily guaranteed with square-cut stems). Bonding cement is carefully controlled to prevent an unnecessary increase of mass. The Type V tip makes a minimal contribution to the total effective stylus mass.

The entire diamond of the V15 Type V is polished, but the areas actually in contact with the record are MĀSAR-polished to reduce surface noise and record wear.



revolutionary
new

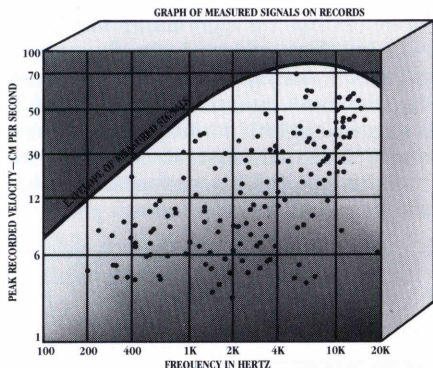
Total Trackability Index (TTI)

A comprehensive measure of cartridge trackability...in a single TTI number!

The development of Trackability measurements by Shure quantified the ability of the diamond stylus tip to stay in contact with the record groove. Trackability has become universally accepted by critics and audiophiles as the most important factor describing a cartridge's performance. However,

Shure recognized the need for a more encompassing measurement to include such factors as record wear, tip wear, and the ability to track complex signals found in today's audiophile records. Intensive research and measurements have led to the comprehensive Total Trackability Index (TTI) measurement!

measured high level complex signals



Record Levels

The dots in the chart above indicate actual measured velocities of "hot signals" at the frequencies found on modern recordings. These singular frequencies at their high velocity levels represent a trackability challenge to any cartridge. However,

the complex signals of modern recordings are simultaneous combinations of these difficult to track frequencies and represent the Total Trackability Challenge a cartridge must meet.

At any instant, the low, mid, and high frequency demands placed upon the cartridge by the complex signal determine the trackability requirement. In order to meet this requirement a cartridge design must correctly address all three frequency ranges.

Shure has developed a test and a record (the TTR117) which enable evaluation of the trackability in each of the ranges simultaneously to yield a rating of the cartridge's total tracking performance in a single number, called the Total Trackability Index (TTI). The TTI number is the product of the Trackability Factor and the Indentation Factor... $TTI = TF \times IF$. The higher the TTI number, the better the Total Trackability of the cartridge.

Total Trackability Index (TTI)

Trackability Factor (TF)

The test signal on the TTR117 is a composite of tones from the low, mid, and high frequency ranges with relative levels of each tone based upon the chart on Page 10. At a given tracking force, the level of this signal a cartridge can successfully track establishes a Trackability Factor (TF) for the cartridge. While this is a major factor in the Total Trackability Index (TTI), it is not the only factor.

Indentation Factor (IF)

In developing the Total Trackability Index, stylus tip geometry and tracking force also had to be taken into account, because a cartridge that achieves high Trackability at the expense of record and tip life cannot be considered equal to a cartridge that achieves the same Trackability with less record and tip wear. The IF is the computed degree the tip sinks into the impressionable record vinyl. The IF indicates the record and tip life to be expected from the combination of tracking forces and tip geometries. To this end, the Indentation Factor (IF) takes these differences into account and penalizes heavier tracking forces and inferior tip geometries, while giving an edge to lighter tracking forces and optimized contact shapes. The chart at right shows a sampling of Indentation Factors for various stylus tip geometries and tracking forces, based upon a study sponsored by Shure.

INDENTATION FACTOR (IF)

Tip Geometry	Tracking Force (grams)			
	1.0	1.5	2.0	2.5
Spherical 15 μ (.0006 in.)	1.00*	0.76	0.63	0.54
Biradial elliptical 5 x 18 μ (.0002 x .0007 in.)	0.91	0.69	0.57	0.49
Hyperelliptical 5 x 38 μ (.0002 x .0015 in.)	1.03	0.79	0.65	0.56
Long contact (other) 2.5 x 100 μ (.0001 x .004 in.)	1.21	0.92	0.76	0.65
5 x 50 μ (.0002 x .002 in.)	1.10	0.84	0.69	0.60

* Reference

The TTI Rating—some comparisons

What better way to demonstrate this new measurement concept than with our extraordinary new cartridge? The minimum TTI for the V15 Type V is 91.7, the highest we've measured for any cartridge.

To add perspective, the following chart shows the TTI ratings for several Shure V15 phono cartridges:

Model	Minimum TTI Rating
V15 Type V	91.7
V15 V-G	89.0
V15 IV	81.4
V15 IV-G	79.0

NOTE TO AUDIOPHILES: For a complete explanation of the TTI, including theoretical and practical considerations, write to Shure Brothers Inc., Customer Services, 222 Hartrey Ave., Evanston, IL 60204, U.S.A.

high technology cartridge system

Great care has been taken to make the beryllium MICROWALL/Be shank, the completed stylus, and cartridge body a finely tuned system. It is this total integration of cartridge body and stylus that results in the extended high frequency Trackability of the V15 Type V, and its unprecedented flat response across the entire audio spectrum.

Four areas of the V15 Type V body merit particular attention: reduced electrical impedance, contact integrity, laminated pole pieces, and total encapsulation.

Lower impedance

The V15 Type V features high output levels with fewer turns of wire. This gives the V15 V a lower impedance value at the terminals, making the frequency response of the cartridge less sensitive to capacitive and resistive loading. The combination of high output and low impedance makes the V15 V compatible with virtually any playback system, without the additional noise induced from head amps or load sensitive transformers.

Better electrical contact

Cartridge performance may be hindered by poor electrical contact. For maximum contact, the V15 Type V provides gold-plated terminals for high conductivity from the cartridge to the tone arm. In addition, because gold is an inert material, these connections are corrosion resistant to assure the same high output/low loss performance indefinitely.

Superior laminated pole pieces

The V15 Type V uses thin, multi-sectioned pole pieces within the body which set it apart from all other cartridge designs. The result is a highly efficient magnetic structure which works in unison with the mechanical response of the stylus assembly to yield an extended ruler-flat cartridge frequency response.

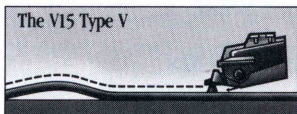
Totally encapsulated

The cartridge body of the Type V is formed by an encapsulating molding technique that holds the internal components rigidly in place to eliminate resonances that might color or blur the signal and thereby lessen the stereo effect. This process also ensures performance uniformity and cartridge longevity, eliminating the possibility of short or open circuits in the electrical components that could render the cartridge inoperative.

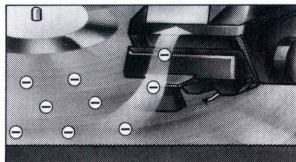
The Dynamic Stabilizer/Destaticizer

Shure's exclusive Dynamic Stabilizer acts like a miniature shock absorber, maintaining a constant cartridge-to-record distance and uniform tracking force, eliminating such warp-related problems as groove skipping, cartridge bottoming, signal wow, and even amplifier and/or speaker overload.

The viscous-damped Dynamic Stabilizer attenuates the arm-cartridge system resonance effect which causes large increases in subaudible output and possible mistracking. In addition, the Dynamic Stabilizer protects the stylus and record from damage if the arm is accidentally dropped onto the record.



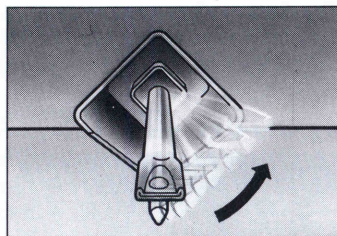
There are over 10,000 tiny, electrically conductive fibers in the Dynamic Stabilizer. Simultaneously, they glide silently in the grooves, discharging surface static electricity while sweeping away microscopic dust particles at the point of playback.



SIDE-GUARD Stylus protection system

First developed by Shure for use in the professional broadcast and recording industries—where stylus durability demands are critical—the SIDE-GUARD stylus protection system prevents stylus damage which may occur when the cartridge slides accidentally across the record or against the edge of a record or turntable platter.

The SIDE-GUARD stylus protection system responds to side thrusts on the stylus by withdrawing the entire stylus shank and tip safely into the stylus housing before the shank can be damaged.



This front view of the SIDE-GUARD stylus protection system demonstrates its operation. The arrow shows the direction the stylus takes when subjected to potentially harmful side thrusts.

Simplified cartridge mounting

Attaching the V15 Type V to your tone arm headshell is a simple operation. Instead of fumbling around trying to hold brackets in place on the cartridge while attempting to fit the mounting screws through the holes, Shure has designed ingenious EZ-lock tapped nuts. These nuts fit into place on the cartridge so that both hands are free to position the headshell and attach the screws, reducing mounting time and frustration.

Precision Alignment Instrumentation

DUO-POINT Alignment Gauge and Leveling-Alignment Stylus

Even the best cartridge will deliver poor performance if not precisely aligned. The V15 Type V comes equipped with two instruments to insure precision alignment and optimal sound reproduction.

The Shure DUO-POINT Alignment Gauge enables you to align the cartridge so that it is tangent to the record grooves at the two precise points that minimize distortion caused by lateral tracking error.

This gauge is far more accurate than traditional overhang adjustments, reducing the possibility of error to a fraction of a degree. The cartridge body rests in a closely fitted nest, providing both a stable work station for mounting to the headshell and a holder that facilitates cartridge body alignments on the gauge.

The Shure Leveling-Alignment Stylus allows you to set the horizontal plane of the cartridge body so that it is precisely aligned in relation to the record surface. This minimizes crosstalk while maximizing stereo imaging and channel separation. Special shims are provided to enable perfect, permanent alignment—even with tone arms that do not provide for this adjustment.

Both instruments are easy to use and take very little time or dexterity.

Individual computer printout

With the V15 Type V comes a new level of accuracy and precision in testing. Using a new computerized testing system, effects due to the test record or playback system which can influence the measurement are calibrated out. A computer printout, generated by this system, is enclosed with every V15 Type V. It is identified by serial number to your individual cartridge.

Specifications

Tracking Force:

	Force at the stylus tip	Total tone arm setting with Dynamic Stabilizer "operating"
Optimum	10 mN (1.0 gram)	15 mN (1.5 grams)
Maximum	12.5 mN (1.25 grams)	17.5 mN (1.75 grams)

Force Exerted by Dynamic Stabilizer: 5 mN (0.5 grams)

Tip Geometry (Typical): Hyperelliptical, $5\mu \times 38\mu$ (.2 mil x 1.5 mil) long contact

Trackability at 10 mN (1 gram) Tracking force (Typical in cm/sec peak velocity):

400 Hz	: 30 cm/sec	5 kHz	: 80 cm/sec
1 kHz	: 46 cm/sec	10 kHz	: 60 cm/sec

Total Trackability Index (TTI): 91.7 minimum

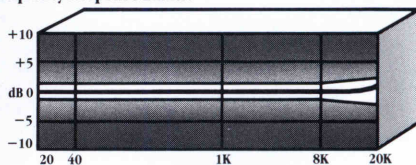
Vertical Tone Arm Resonance: Less than 5 dB rise at 14 Hz in SME Series III Tone Arm (without SME damper).

Channel Balance: Within 1.5 dB

Channel Separation: 1 kHz: 25 dB or greater;
10 kHz: 18 dB or greater

Output Voltage (Typical): 3.2 mV RMS at 1 kHz at
5 cm/sec peak velocity

Frequency Response Limits:



FREQUENCY IN HERTZ

Recommended Load: 47 k Ω in parallel with 250 pF (includes tone arm wiring, connecting cables, and preamplifier input). Capacitive loading from 100 pF to 400 pF will cause negligible change from the recommended 250 pF loading.

Resistance (Typical): 950 ohms, dc

Inductance (Typical): 330 mH at 1 kHz

Cartridge Weight: 6.6 grams

Replacement Stylus: V15V—VN5HE, Nude Hyperelliptical tip, $5 \times 38\mu$ (.0002 x .0015 in.) Black serial numbers
V15V-G—VN5G, Nude Spherical tip, 15μ (.0006 in.) Red serial numbers

Optional 78 rpm Stylus: VN578E, Biradial (elliptical) tip, $13 \times 63\mu$ (.0005 x .0025 in.)