

NO. TTR-110

33 1/3 rpm - STEREO



AN AUDIO OBSTACLE COURSE—ERA III

THE SHURE TRACKABILITY TEST RECORD

ABOUT THIS RECORDING

This recording is an audible test of a phonograph cartridge's Trackability; that is, its ability to stay in contact with the groove modulations over a wide range of frequencies and intensities; in other words, to track the groove.

Today, Trackability is widely regarded as the true measure of a cartridge's performance because it incorporates the meaningful design parameters of compliance, mass, etc. It avoids the misunderstandings generated when only one of these parameters is taken as a criterion for performance.

Recording engineers have known for many years that the tracking ability of cartridges is the main factor in determining the dynamic range of the records which they may cut. Sometimes, tracking demands may be so severe as to make some recorded passages unplayable. The stylus will simply jump to the next groove; or, mistracking may be so subtle as to cause a violin to sound muted, or unnatural.

This record rises above the present limit of the record dynamic range in order to place extreme demands on the tracking ability of phono cartridges. It reproduces a number of excerpts from actual program material (musical bells; sibilance; violin), first at a very mild recorded level, then at progressively higher recorded levels. As the recording level increases, the velocity and resulting acceleration of the stylus increases enormously. Eventually, even some very good stylus may not follow the wildly undulating grooves, and audible mistracking takes place. (Note: The Bass Drum Test presents a solo instrument because of the nature of the musical material normally associated with the bass drum. In practice, its mistracking cannot always be isolated, as such, but it degrades the sound of the other instruments to which it is supplying the "beat.")

Most cartridges should be able to effectively track the mildest recorded level on this record at their rated stylus force, but only a truly exceptional cartridge will track the 5th level without breakup. Each excerpt on Side One is first played at a mild level, then at an increase of level of 5db, followed by three additional playings, each 2 db higher than the preceding.

The five levels encompass a total increase of 400% in velocity (from level one to level five). Actually, the recorded levels are so high at the end of each test and the velocity increase so great that it seems a near miracle that any cartridge could successfully track level five.

Side Two contains the selections from which the musical bells, sibilance and violin tests were taken, recorded with a wide dynamic range (with maximum levels similar to level four of the excerpts). These selections are by no means unique in their wide dynamic range... in fact, more and more modern recordings are being introduced with increasingly "hot" passages. Given a good cartridge capable of tracking these demanding grooves, such as the Shure V-15 Type II or V-15 Type III, these wide range passages are a true delight to the music lover's ear! Today, wide range recordings comprise much of the music that tingles the spine, and calls forth torrents of praise for the artist, the recording company, and the individual's high fidelity system.

IF YOU ARE FAMILIAR WITH THE SHURE TTR-101

This recording differs from Shure's pioneering TTR-101 Audio Obstacle Course recording in many significant aspects. Even though the total level range within each test is no greater than on the TTR-101 recording, the increments of increased velocity are refined (6 db from first to second level, and 2 db for each of the three

succeeding levels versus 4 db steps in four levels on the TTR-101), so that more meaningful and sensitive tests can be conducted with today's increasingly sophisticated phono cartridges, tone arms, and turntables.

Also, where the TTR-101 isolated individual instruments, this recording presents difficult-to-track instruments in orchestral and vocal ensembles from commercial recordings, thereby offering a more demanding test under more natural conditions. Finally, the inclusion of the selections from which the various excerpts were taken offers a valid musical test in which the difficult-to-track excerpts are related to normal listening situations.

GENERAL AND TECHNICAL INFORMATION

• **DO NOT PLAY THIS RECORD WITH A MONO-PHONIC CARTRIDGE.** Use only a STEREO cartridge. Set tracking force to lightest recommended force for the cartridge being tested. Sometimes, increasing the force (but never above the recommended maximum) helps trackability.

• **IMPORTANT:** Once mistracking occurs, do not advance to the next level of the test. Mistracking causes damage to the record itself. Avoid repeated playing of this record with low trackability cartridges because high frequency characteristics of the record will be erased by the groove-deforming action of the stylus.

• All five recorded levels of any one excerpt have been taken from identical master tapes of the same recorded intensity. The levels on the record have been increased at the cutting head—the balance of the recording equipment, settings, etc., remain exactly the same for all five levels.

• **Actually, different cartridges create inherently different sounds when mistracking the same musical pas-**

sage. With some cartridges, mistracking results in loss of timbre, or musical character, while with other cartridges you can experience violent "sputtering" and cacophonous noise on the same recorded passage.

• You are urged to keep a "score chart" of the cartridge. (See below.) Audio "memory" is demonstrably too limited to be relied upon in these precise tests.

• **ALWAYS** compare the sound of levels two, three, four, and five against the sound of level one. This is especially important because your ear may have been "conditioned" to improper timbre, etc., by many, many years of hearing records distorted by mistracking.

• You may wish to reduce the gain on your amplifier for each successive level. This will make comparison easier and prevent amplifier or speaker overload.

• The trackability tests on Side One, and Band One of Side Two are cut monophonically (lateral cut). Therefore, when the cartridge is tracking properly, you will hear the same sound coming from both speakers. This makes it easier to isolate mistracking. Side One, Bands One and Two, and the whole of Side Two (except for Band One) are recorded in stereo so the same mistracking that was encountered at level four on Side One may be expected, but the overall effect may sound different due to the introduction of stereo.

• The built-in stylus force calibration on some tone arms may not necessarily be adjusted accurately. It is recommended that you acquire a separate gauge, such as the Shure SFG-2 Stylus Force Gauge, to double check the built-in stylus force calibration of your tone arm.

• The qualities of sound are difficult to describe in words; therefore, what you hear at the point of mistracking may not be precisely as described here. Our descriptions of the sound are a composite opinion of a select panel of knowledgeable engineers and musicians.

SIDE ONE

Bands three, four and five are recorded in both channels simultaneously. For the entire record, it is important to set your amplifier to "STEREO" mode even though this will not create the stereo effect—i.e., the same sound will be heard from both speakers.

RECORDED MATERIAL / WHAT TO LISTEN FOR

BAND ONE—INTRODUCTION

Completely self-explanatory introduction to the recorded material that follows. The narrator is Roger Anderson, Shure's Assistant Chief Engineer.

BAND TWO—LEVEL, BALANCE, PHASING TESTS

Enables you to check your system. The narrator describes exactly what to listen for.

BAND THREE—MUSICAL BELLS TEST—EXCERPTED FROM SIDE TWO, BAND TWO

Musical bells, generally speaking, result in one of the most severe high frequency trackability tests we have found. Even when their fundamental tones are not overwhelming (even at levels four and five), the energy generated by the harmonics is so intense that the stylus is wrenched about in a fantastically violent free-form "dance." Stylus velocities at level five exceed 25 cm/sec (l) at 10 kHz.

BAND FOUR—SIBILANCE TEST—EXCERPTED FROM SIDE TWO, BAND FOUR

Sibilances are strong "S" sounds. They are quite common among speakers and singers, and hearing sibilances on recordings is quite normal—especially when close-microphone techniques are used. However, because of the peculiar sound waves set up by sibilant sounds, mistracking can often occur with irritating and disconcerting results. (Note: you can also hear lower velocity sibilant sounds (SSS) in the voice of the narrator, and in the chorus on Musik zum Verlieben; Side Two, Band Two.)

BAND FIVE—BASS DRUM

This is an excellent low-frequency trackability test. Make certain the mistracking sound you hear is due to the record and cartridge, and not to some object or piece of furniture (especially the loudspeaker) in the room rattling about because of the low frequency vibrations.

NOTE: READ ALL THE "GENERAL AND TECHNICAL CONSIDERATIONS" BEFORE PLAYING. SET TRACKING FORCE AT LIGHTEST WEIGHT. SET ANTI-SKATING CONTROL TO SETTING RECOMMENDED BY THE TURNABLE MANUFACTURER. SET MODE SELECTOR ON AMPLIFIER TO "STEREO."

NOTE: The so-called "ping-pong" effect is a hopelessly obsolete criterion for good stereo. Listen instead for spatial location of instruments in the total stereo picture, and the ability to isolate individual components of the orchestra.

BAND THREE—MUSICAL BELLS TEST—EXCERPTED FROM SIDE TWO, BAND TWO

Listen to the sound of the bells at the first level and judge the sound of levels two, three, four, and five against the sound of level one. With all but the finest cartridges, mistracking often takes place quickly on this band. Mistracking bells sound rasping, knocking, or like tin cans, or ticking clocks (on the sound of the initial transient of the bell).

BAND FOUR—SIBILANCE TEST—EXCERPTED FROM SIDE TWO, BAND FOUR

Notice the strong sibilant "SSSS" sounds right after the opening phrase "Mais Que Nada." This sibilance occurs three times in each excerpt—the first "S" is medium "hot" intensity, the second is relatively low intensity, and finally, just prior to the fade, we hear the strongest of the three sibilances. Mistracking the sibilance sounds like "SHHHHHH" with strong over-accenting of the offending syllable. Some people compare the sound to rubbing sheets of sandpaper together.

The sound should be smooth—especially at the beginning of the drum stroke. First effect of mistracking is a rattle cracking at the stroke and shortly thereafter. The sound will be harsh and unnaturally resonant. In severe mistracking the stylus will actually jump the groove on this band.

SIDE TWO

Band One is recorded the same as Bands Three, Four and Five on Side One. The commercially recorded music that makes up Bands Two, Three and Four are stereo recordings cut to approximate level four of the preceding excerpts.

RECORDED MATERIAL / WHAT TO LISTEN FOR

BAND ONE—VIOLIN TEST—EXCERPTED FROM SIDE TWO, BAND THREE

This band is an excellent test for mid-frequency trackability. In this recording, the violin is pushed to the limit of the medium. Since the violin is such an important component of most serious music, particularly chamber music, it is vital that your cartridge take this test in stride. Also, low-frequency instruments usually generate a great number of mid-frequency transients.

Violin mistracking is difficult to describe, but quite audible. It manifests itself in many different ways: "tics" may appear—sounding like dust in the grooves; there is a general deterioration of sound as if the speakers were out of phase; the sound spreads and mislocates; there is a dilution of timbre. Compare higher velocity cuts with the lowest recorded level on this band and you'll hear the particular effect violin mistracking has with your cartridge.

BAND TWO—MUSIK ZUM VERLIEBEN by the GÜNTER KALLMANN SINGERS

From the recording ELIZBETHAN SERENADE, Polydor Stereo, Deutsche Grammophon Record Number 237910A. The Musical Bells excerpt is from this recording.

BAND THREE—EXCERPT FROM ORPHEUS MUSIC by LEE HOLDRIDGE

From the recording made for Shure demonstrations at the Audio Engineering Society Show in 1971. The recording was made under the direction of the composer. The violin excerpt is from this recording.

(By Courtesy of Lee Holdridge)
(Recorded at Vanguard Recording Studios by John Woram)

BAND FOUR—MAIS QUE NADA by SERGIO MENDES AND BRASIL '66

From the recording SERGIO MENDES AND BRASIL '66, A&M Record Number SM4116. The Sibilance excerpt is from this recording.

HOW TO "KEEP SCORE" OF CARTRIDGE TRACKABILITY

Rule one in comparing cartridge trackability is DO NOT TRUST TO MEMORY. For one thing, audio memory is amazingly short... even among "experts." An A-B test would be ideal for comparing cartridges, but this takes expensive equipment and precise setups. We recommend that you use the chart at the right. Simply grade the cartridge "O," "S," "X," or "*" for its ability to track various bands. (See "Scoring Table.") Then you can compare one cartridge against another... even days later. **IMPORTANT:** Once mistracking occurs, do not continue the test.

SCORING TABLE

O—Tracking Well
S—Mistracks Slightly
X—Mistracks
*—Crackles
Considerably.
Gross Distortion
Present.

		Stylus Force	Bells	Sibilance	Drum	Violin
Level 1	Reference					
Level 2	+6 db					
Level 3	+8 db					
Level 4	+10 db					
Level 5	+12 db					