Hi-FI SOUND STEREO TEST RECORD HFS69

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Instructions and Technical Data

Side 1

Each complete test or group ends with a locked groove. At the end of a test lift the pickup, then lower it once more at the next test selected.

Test 1 Channel recognition, phasing and balance. Transient random-noise bursts with spoken announcements recorded under free-air conditions.

Band A: Left and right channel identification.
Band B: Balance and phasing: signals in phase.
Band C: As B but signals out of phase.

Listen in the normal position relative to the loudspeakers. If the reproducing system is correctly set up, the signals should give an effect as specified in the announcements. If the channels are found to be reversed change over either the two pickup inputs or the two pairs of loudspeaker leads. Alternatively operate the 'channel reverse' switch if the amplifier is so equipped.

The test may reveal an out-of-phase condition which may be due to reversal of pickup or loudspeaker connections. To decide which, switch the amplifier to mono when the signal will tend to cancel on band B and increase on band C (converse of the effect required) if the pickup connections are wrong. Otherwise the loudspeaker connections are those to be changed over, on one loudspeaker only. When phasing is correct the image is firm and central and can be shifted from side to side with the amplifier balance control so that movement of the image between the loudspeakers can readily be followed.

Switch off the amplifier before disturbing any connections.

The transient nature of the wide-range signals can be used to assess room reverberation.

Test 2 White noise (monophonic). Generated from General Radio Type 1382 random-noise generator which produces noise with constant energy per Hz bandwidth, ±1dB 20-20,000Hz. Recorded nominally rms -12dB ref. 5cm/sec at 1kHz, 45°, when equalised

The test is for subjective evaluation of pickups and loudspeakers and is also useful for subjective setting-up of tape recorder bias and head adjustment, particularly where tape monitoring facilities are provided. The sound should be smooth and not apparently very loud; the closer it is to an evenly distributed noise, without emphasis of particular areas, the better. White noise shows up shortcomings in pickups and loudspeakers which other tests fail to reveal. If systems or components are being compared using this test, the amplifier tone controls should be set 'flat'.

Test 3 Determination of side thrust adjustment and minimum tracking weight of a pickup. In two groups. lateral and vertical modulation. Locked groove after first group.

Band A: 300Hz lateral +12dB ref. 1.12×10^{-3} cm peak amplitude.
Band B: 300Hz lateral +15dB ref. 1.12×10^{-3} cm peak amplitude.
Band C: 300Hz vertical +8dB ref. 1.12×10^{-3} cm peak amplitude.
Band D: 300Hz vertical +12dB ref. 1.12×10^{-3} cm peak amplitude.

This test is intended for use with high fidelity pickups- predominantly magnetic types—fitted with stylus pressure and bias corrector adjustments

Setting up for the lower level cuts A and C has been found to represent the minimum standard for high fidelity groove-tracing performance, and satisfactory results can usually be obtained from good quality discs.

However, if it can be achieved within the manufacturer's tracking weighttrange, more consistent and superior results will be gained by setting up for the higher level modulations B and D. The test establishes the minimum tracking weight beyond which it is highly unlikely any improvement can be gained by making an increase. In average conditions it is not practicable to play at under 1 gm, so with high-grade pickups, provided the test can be completed well within the cartridge manufacturer's recommended range, the use of B and D is advocated wherever possible to ensure the pickup tracks the high levels recorded on modern discs.

It is not implied that the pickup, when adjusted with the aid of these tests, will accurately track every music record. The tests do however suggest parameters above and below which there is little if any advantage to be gained by making further, experimental adjustments.

Starting with the tracking weight within the cartridge manufacturer's recommended range, adjust the weight and the bias correction until the chosen lateral and vertical bands can be played without audible signs of mistracking (eg, splutter, crackle or harmonics of the 300Hz tone). Make the adjustments by small degrees until the test bands are tracked securely and cleanly at minimum pressure. It is instructive to view the waveform on an oscilloscope.

Adjustment of bias correction using a blank, uncut surface is unreliable and not recommended The recommended procedure, as outlined above, gives much closer approximation to ideal tracking but it may be found on occasion that improvement will result from increasing the proportion of bias correction, rather than the stylus pressure, for severely modulated records.

The bands of Test 3 will wear out if used a great deal, and in that case the disc should be replaced.

Test 4 Applause. This test is quite different from white noise although superficially resembling it. For the listener the aim is to discern details—to identify the greatest possible number of individual sounds contributing to the overall sound.

A degree of presence lift has been applied to make the test more rigorous in the region where the ear is most sensitive and transducers are at their weakest. This is a mono recording, so that two loudspeakers can be compared side by side, one on each channel. Again, where two speakers are dissimilar they can be brought closer together in characteristics by the use of controls, either on the speakers or on an amplifier having separate tone controls for each channel.

Test 5 Musictest. This band, which should be tracked cleanly by a high-grade pickup that has been properly adjusted, is placed at the end of the side to make the test more rigorous. Characteristics of the sound, as assessed on equipment of the highest quality, are deep, firm bass and a recording balance favouring brass and percussion.

The test ends with blank grooves. If the reproducing system volume level has been set realistically for the music, the noise heard during the tracing of these grooves (system noise plus residual noise of the recording equipment) should be acceptable. Warning: an inferior pickup may damage the music test section, affecting its usefulness in any subsequent checking of high-grade components.

P.T.0.

Side 2

Each complete test or group ends with a locked groove. At the end of a test lift the pickup, then lower it once more at the next test selected.

Test 1 Reference level and channel separation.

Band A: Left channel 1kHz, 5cm/sec at 45˚.

Band B: Right channel 1kHz, 5cm/sec at 45˚.

This is becoming the international standard reference level for testing cartridges. It is used to measure output voltage and mid-band separation.

To measure pickup output, use an audio millivoltmeter with a sensitivity adequate for the cartridge's stated output and separation. Connect a load resistor accross its input terminals in accordance with the cartridge manufacturer's recommendation (this is usually 47-68kohms). Magnetic cartridge outputs are typically around 5mV — that is, 1mV per cm/sec. recorded velocity. Separation (and crosstalk) is referred to in terms of dB down, left on right or right on left, and is typically 15-30dB at 1kHz.

If an oscilloscope is available it is interesting to observe the waveform on the unwanted channel while the test is in progress. The signal was derived from a Radford low-distortion oscillator, LDO Series 2.

Test 2 Pink noise. Generated from a General Radio Co. Type 1382 random-noise generator, which produces constant energy per octave bandwidth (-3dB per octave) ±1dB 20-20,000Hz Recorded nominally rms -7.5dB ref. 5cm/secl kHz, 45˚, when equalised.

This test is primarily for use in pickup technical evaluation via constant-Q third-octave filters or through suitable spectrum analysers.

Since it is effectively white noise 'sloped' (a smooth slope with bass emphasis and top fall-off) pink noise is useful in loudspeaker evaluation and setting-up. It is of value also in checking that each drive unit in a multi-unit loudspeaker system is properly phased. Moving the ear close to the units, listen for a smooth transition from one unit to another. Generally, the sound should seem to come from the loudspeaker system as a whole and not from individual units. That is, a well integrated system is a major design aim. The test also provides useful information on the operation of a system in a room. Deep bass should be apparent but felt rather than heard.

Test 3 Tone bursts. There are eight bands of 1kHz tone bursts derived from a Radford LDO Series 2 oscillator interrupted through a General Radio 1396-B tone burst generator.

Band A: Left channel 2 cycles on, 2 off. Ref. 10 cm/sec nominal.

Band B: Right channel 2 cycles on, 2 off. Ref. 10cm/sec nominal.

Band C: Lateral 2 cycles on, 2 off. Ref. 10 cm/sec nominal.

Band D: Vertical 2 cycles on, 2 off. Ref. 10 cm/sec nominal.

Band E: Left channel 16 cycles on, 16 off. Ref. 10 cm/sec nominal.

Band F: Right channel 16 cycles on, 16 off. Ref.10 cm/sec nominal.

Band G: Lateral 16 cycles on, 16 off. Ref. 10 cm/sec nominal,

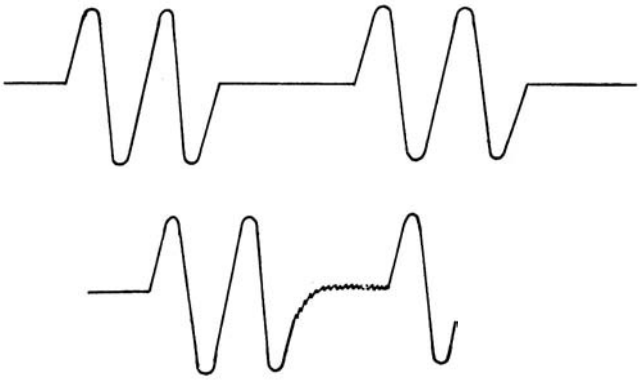
Band H: Vertical 16 cycles on, 16 off. Ref. 10 cm/sec nominal.

Tone-bursts are of value in cartridge and loudspeaker evaluation An oscilloscope is required.

If testing a cartridge, connect it eitherdirectly to the oscilloscope (with the appropriate load resistor across the terminals) or via an appropriate preamplifier to the oscilloscope. Adjust thetime-base to display the interrupted tones as a stationary trace. If a loudspeaker is to be tested, a microphone and suitable amplifier will be required and allowance will have to be made for room effects and the response of the cartridge employed.

It is possible to interpret the rise-time or 'attack' of a transducer and its overhang together with resonant characteristics stimulated by the tone-bursts. No transducer can give perfect results on this test but the user will be able to observe how closely the output waveform corresponds to the generated tone-bursts.

The first illustration shows the waveform fed to the cutter head during recording. The lower one shows an output waveform. Full interpretation of results will not be achieved until some experience is gained. Vary the turntable speed for different frequencies.



Test 4 Wow and flutter. Lateral cut 5cm/sec nominal, 3kHz, for use with wow and flutter meters.

Check concentricity. Two concentric grooves are provided at the edge of the record before Test 1.

Test 5 Rumble. Lateral cut 10cm/sec nominal, 1kHz reference tone, followed by unmodulated grooves. For measurements using a suitable weighting network, related to the subjective annoyance value of rumble, referring to either the nominal 10cm/sec level provided or any other desired reference level or frequency. The result of the test depends on the resonance of the particular arm and cartridge employed and on the turntable mounting procedure and ambient noise.

Residual noise in the unmodulated groove is that of the cutting lathe only. No recording amplifier noise is present.

Hi-FiSound recommend that you make a simple paper wrapper to replace the inner sleeve in which this record is packed. It should be just big enough to contain the record. Use clean, smooth paper, free from any loose particles or dust, and make four flaps which will completely cover and protect the record. With this arrangement there is little danger that trapped abrasive particles will be pulled or slid across the record surface. Place the record in the wrapper and fold the flaps over. Then insert the wrapped record in the outer sleeve.