Equipment Profiles

This Month:

- **Sony Model PS-1800 Turntable System**
- **Heathkit Model AS-48 Speaker System**
- **Audio Dynamics Model ADC-25 Stereo Cartridge**

Sony Model PS-1800 Servo Turntable System

MANUFACTURER'S SPECIFICATIONS:

Speed: 33⅓ and 45 rpm. Speed-Control Range: ±4%. Starting Response Time: Within 0.5 sec. Wow and Flutter: Less than .08%. Rumble: Over 60 dB. Dimensions: 19 5/16 W x 7 1/16 H x 16¼ D. Weight: 21 lbs. Price: Under $200.

The new Sony Model PS-1800 servo turntable system, with a good tone arm and a handy shut-off/arm-return feature, belongs right alongside other top-quality turntables. It's a handsome, well coordinated component package.

The PS-1800, complete in its walnut base and hinged plastic lid, is an outstanding example of good engineering —from the top of the dust cover to the rubber feet at the bottom of its handsome oiled-walnut base. The two-speed unit, electrically switchable between 33⅓ and 45 rpm, has a fine-speed control that can vary the speed ±4%. A built-in strobe system enables one to exactly set the speed right and keep it there regardless of load or line variations. A thumb-wheel adjustment varies the speed, while a coarser (screwdriver) adjustment is available under the chassis.

The turntable is belt-driven by a slow-speed (300 rpm) d.c. motor which is servo-controlled via an electronic network. Since rumble is a function of mass and velocity squared, a reduction in the rotating speed will reduce the motor-caused rumble by the square, everything else being equal. This presumes good bearings and no eccentricities. The motor in this case is quiet and well suspended. Its pully drives a neoprene belt which runs around an 8-in. diameter turntable wall which is part of the 12-in., two-pound, die-cast, aluminum-alloy platen assembly. The

Fig. 1—The Sony PS-1800 turntable system. Note the reject/off button on the front of the wood base.

platen sits almost flush with the cast base into which the tone arm is also mounted. A machined ball built into the tip of the platen's shaft rides on Teflon at the bottom of the well. A start/speed selector control, conveniently located just in front of the tone arm's head, starts the motor and gently lets down the arm via a hydraulic arm lift. Pushing an illuminated, red push-button built into the front face of the walnut base causes the one-arm to lift, return to its rest position, and shut off the entire system. The shut-off, lift and return also takes place automatically when the tone arm reaches the lead-out grooves at the end of a record.

A unique feature of the automatic arm return is the magnetic proximity sensing mechanism. Sony calls it "Magnetodiode." An advantage of this method, which in the initial stage is electronic rather than mechanical, is that the arm can be handled manually at anytime — even in the lead-out grooves—since manual operation overrides the gentle, automatic arm-nudge to get back to rest position. In fact, one doesn't feel the slightest force on the arm when it is held in the middle of its cycle. And, of course, there is no drag on the arm since the arm return operation is initiated electronically.

The tone arm in this package is statically balanced, using one counterweight for see-saw balance and another, graduated one, for tracking force. A fish-line weight/pulley arrangement provides anti-skating force. The static balance, as opposed to dynamic balance using springs, means the unit cannot be used "upside down," but neither will the tracking force settings change with time. The tone arm is 9-in. long from pivot to stylus, with a 9/16 in. overhang and a tracking error of just over 1 degree. It can accommodate just about any cartridge weighing between 4.5 and 11 grams. The arm has a slide to adjust the stylus overhang precisely for minimum tracking error. Accurate built-in stylus force markings on the rotatable counterweight make it easy to balance the arm and set the proper tracking force. The turntable/arm assembly is spring mounted into the base. Since it is not especially heavy, its suspension is soft.

Performance

We installed an Ortofon Model SL-15-T stereo cartridge into the Sony PS-1800 system for our lab tests. Flutter measured better than 0.04%, while wow was a low 0.03%. The best part was rumble, however. This was a very impressive −41 dB, unweighted, using the NAB measurement method. As many readers know, this is a measure of the electrical effect of low-frequency noise, and does not take into account one's hearing perception. In effect, the unweighted figure might be said to emphasize subsonic frequencies, which, if unusually powerful, could cause audible distortion effects in systems with extended low-frequency response. A "weighted"* rumble measurement, on the other hand, considers the fact that the higher the rumble frequency the better we hear it. Using an "A" weighting network to provide us with rumble measurements weighted in favor of noise that is audible, the Sony PS-1800 turntable system with the aforementioned cartridge measured −67 dB (weighted), which is exceptionally good. Since rumble is also a function of the cartridge used for measurement, a cartridge which doesn't have a good low-frequency response will yield even more impressive rumble figures.

The tonearm handled and performed very well, adding to the overall capability of the integrated unit. It exhibited no reasonances in the audible

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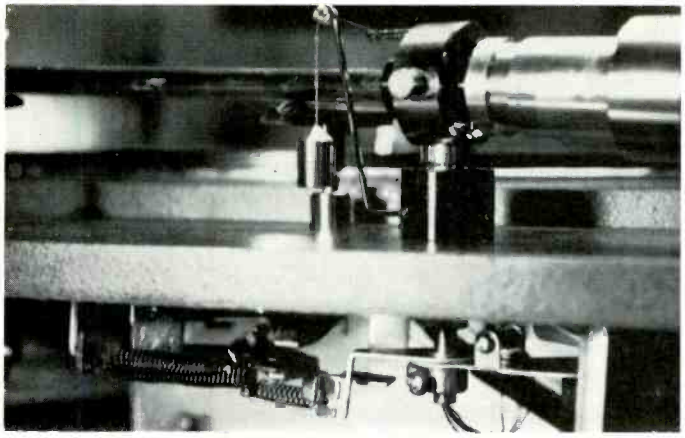


Fig. 2—Side view of the PS-1800's integrated tone arm, showing arm-return mechanism at the moment the arm is returned to a rest position. The actuator engages the arm only at this moment, being free at all other times so that there is no interference with arm operation during play.

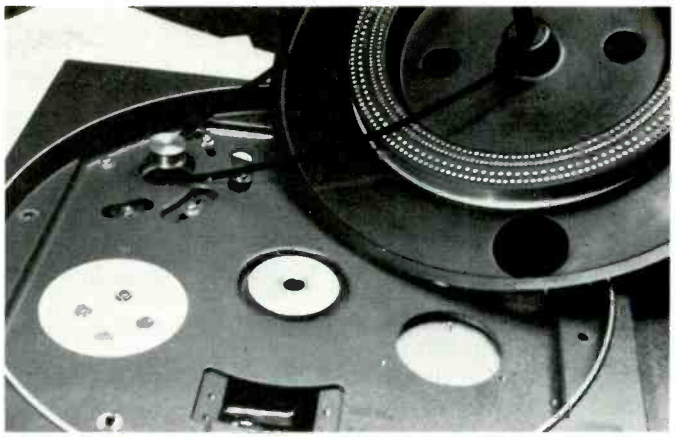


Fig. 3—Looking down into the turntable's drive motor pulley reveals the drive elements. The motor pulley (top) drives the underside of the platter, which is removed and turned over (right-hand corner), via a neoprene belt. Strobe markings may be seen on the platter, as well as a balance weight. The strobe lamp can be seen at bottom.

Fig. 4—The servo-speed-control electronics is pictured here, removed from its underside mounting. A fine-speed-control potentiometer is used, with the shield grounded to the pot's case to minimize noise pickup.

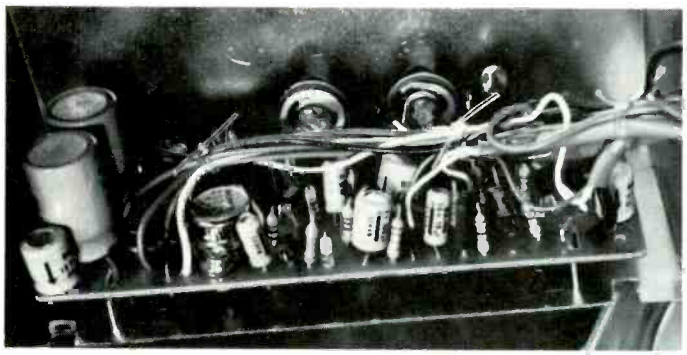
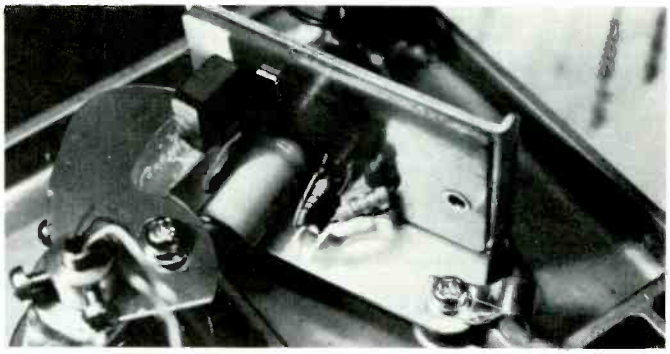


Fig. 5—Here is the underside of the tone arm, showing the arm magnet near the sensing network. The latter energizes a solenoid which starts the lift and shut-off sequence by releasing a spring-loaded linkage.



spectrum. The pivot friction is very low, enabling use of low-mass cartridges tracking at below 1 gram. The unit's relative immunity to external shock and vibration and acoustic feedback is also very good.

Considering the operating convenience features which make the unit so pleasurable to use, coupled with impressively good performance, the Sony PS-1800 can be termed a great integrated turntable. At its price of under $200 (which includes turntable, tone arm, wood base, and dust cover), it is also a great buy for use with any better-than-average stereo hi-fi system where playing records only singly is desirable.

Check No. 42 on Reader Service Card

* For the information of new readers, Fletcher and Munson proved in the early 1930s that loudness depends on frequency as well as on intensity. Robinson and Dadson did similar work in later years, resulting in equal loudness contours, which are illustrated in this issue's *Primer on Sound Level Meters*. These curves use a unit of loudness level, the *phon*, comparing loudness of a reference note to that of a given note. The weighting network used by AUDIO, "A" weighting, whose frequency response is also illustrated in the aforementioned article, is one of three filters employed with many noise meters to obtain subjective measurements. It simulates frequency discrimination of hearing at low levels of sound. Rumble would be more apparent at higher listening levels, naturally. For example, using these International Electrotechnical Commission (I.E.C.)-recommended weighted response curves, a 60 Hz signal would be about 30 dBs below the 1000 Hz's zero dB point with an "A" weighting network, whereas it would only be about 10 dB down with a "B" weighting network, which is used to measure loud noise. Though recognized internationally, these weighting curves do not provide us with what is felt to be an ideal response for our purpose, but it does serve satisfactorily and will have to do until another widely accepted standard is developed. Readers should never compare one weighted rumble figure with another unless each uses the same standard, not to mention the same test setup.

Errata

Last month's profile of the Thorens TD-125 "electronic" turntable stated that its **46-dB** NAB rumble measurement, referenced to 7 cm/sec peak velocity at 1000 Hz, was **11 dB** better than the NAB minimum standard of **—35 dB.** This is the old NAB Standard, of course, which was superseded by a new NAB Standard a few years ago, taking into account stereophonic disc playing and reproducing equipment. Thus, the measurement should have been referenced against the latest standard, which is **5** cm/sec peak velocity at 1000 Hz. Accordingly, the Thorens TD-125 rumble measurement should have read **—43 dB** (NAB), which is **8 dB** better than what the NAB Standard defines as minimum. However, it is possible that the TD 125 is even better than noted because we may well be measuring the record's low-frequency noise (rumble, mold grain, and what-have-you).

Also, on double-checking our measurements with a mint copy of a **CBS Labs** BTR-150 test record, we measured the TD-125's weighted ("A" weighting) low-frequency noise as **—70 dB,** as contrasted with the **—64 dB** figure published last month. In tracking down the discrepancy, we discovered that the test disc used last month exhibited considerably more noise when playing outside grooves (which we coincidentally used during weighted rumble measurements) than when playing inside grooves. On re-testing with the old test record, measurements made while using its inside grooves approached the figure produced with the new test disc.

As a result of the above, we were driven to investigate measurement results garnered from a number of different brands of test records, as well as some copies of each. Interestingly, they differed widely from brand to brand and, in some instances, between pressings of the same label. For example, on a few of the test records, we could not measure beyond the middle-30 dB below the reference level, which indicates that one could employ a test record that exhibits greater low-frequency noise than produced by the turntable under test.

In view of the improvements made in modern turntables (not to mention other components), it is therefore clear that many of the currently available test records are inadequate. Certainly, test records should be developed that exhibit less low-frequency noise than present-day ones do. What we would like to see is a return to the old 1953 NAB definition of a test record, which included a requirement that the record be at least 8 dB quieter in low-frequency noise than the turntable being measured. Based on measurements we made on the TD-125, as well as on the Sony 1800, rumble content of the test record should then not be worse than —51 dB unweighted.