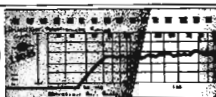


Equipment Reviews



ADC Accutrac 4000 automatic turntable

Price: £287.10. Manufacturer: BSR Ltd., Powke Lane, Cradley Heath, Warley, West Midlands, B64 5QH.



"FOUR knobs and twenty-three buttons—and that's only the gramophone". A typical comment from visitors who have made their first acquaintance with the Accutrac 4000 during the time I have had it on test. Admittedly one's initial confrontation with this piece of advanced technology can be rather daunting for, angled at the front of the baseboard and projecting beyond the dust cover, is the unquestionably impressive control panel.

Of course I know there are still a number of people around who maintain that a large measure of the soul went out of the gramophone on the day when the electric motor first appeared, and one was denied the participatory pleasure of winding the thing up. The other school has maintained all along that the end and not the means was the important thing and, in the name of getting to the music more quickly and more easily (but rarely more cheaply), has fostered a multitude of remarkable machines intended to undertake the apparently simple task of playing records.

One thinks of early automatic changers which removed the spent record from the still rotating (at 78 rpm) turntable by the simple expedient of raising one edge and catching the remains in a hopper. Other devices incorporating powerful motors and bits of bicycle chain sliced into the stack of records, allegedly to separate the bottom one, removing large flakes from the edge in the process, especially if the unfortunate disc was on the thick side. One from the early thirties, which deserved a better fate, only required the user to 'post' the disc into a slot in the cabinet, upon which it was snatched from the hand, played and pushed out again. Nowadays the majority of record players have some measure of automation. Even those who dwell in ivory towers, sporting expensive turntables fitted with admirable arms and exotic cartridges, have had to lower the drawbridge to admit recent advances in electronically controlled gramophones with performance equal to the best of separates, plus an undeniable convenience of use. Accutrac 4000 is the latest of this breed, and it embodies so many features that it will be difficult indeed for any newcomer to overtake it. Nevertheless it is a purposeful design and hardly warrants the description in the financial columns of one of our leading

newspapers as "the 'in' toy for hi-fi enthusiasts".

BSR are one of the oldest and most esteemed manufacturers of record decks and automatic changers, with a prolific output and a remarkable 85% export record. Until recently their products have been manufactured 'in house' almost to the very last screw, but prudence decreed diversification and BSR now incorporates manufacturers of kitchenware, vacuum cleaners and pickup cartridges (the recently acquired American ADC). Even so, Accutrac has taken them on to new ground by incorporating components from other makers and it will help understanding of this complex machine if I too break down this description into the constituent parts.

How it performed

The motor is of the type known as direct drive, which means that it rotates at turntable speed. In case you have been brainwashed into accepting this as a new idea, let me tell you that HMV, Paillard, Simpson, Garrard, and probably many others, all made direct-drive turntables forty years ago. What is new is the electronic control of speed, the reduction of moving parts to one and the provision of a flywheel which is partly composed of electronic components and partly mechanical in the more usual form of a moderately heavy turntable, in this case a well finished and balanced aluminium alloy die-casting. This carries a neat mat and stroboscopic markings on the rim for both speeds and, when lit by the neon lamp provided, for both of the world's common mains frequencies, 50 and 60Hz. The motor itself is manufactured by Matsushita, in whose Japanese laboratories most of the recent progress in this type of drive took place. It is similar to those used in some of their own Technics record players which have featured in earlier reviews. Like others I have checked, it borders on perfection, with wow and flutter down on the base line of the measuring equipment and rumble content around that quoted for the very expensive test disc. Two of the four control knobs on the left side of the panel are pitch variation for the 33 $\frac{1}{3}$ and 45 rpm speeds and they each provide about 6% change: the selected speed is maintained by electronic control, is independent of power supply variations, and remains remarkably stable once set.

The pickup arm is the now almost standard S-shaped polished tube, with decoupled counterweight reading directly in grams and continuously adjustable anti-skating bias. The bearings use tiny ball-races and the 'stiction' is of a very low order, some five-thousandths of a gram in both planes. Underneath the arm is

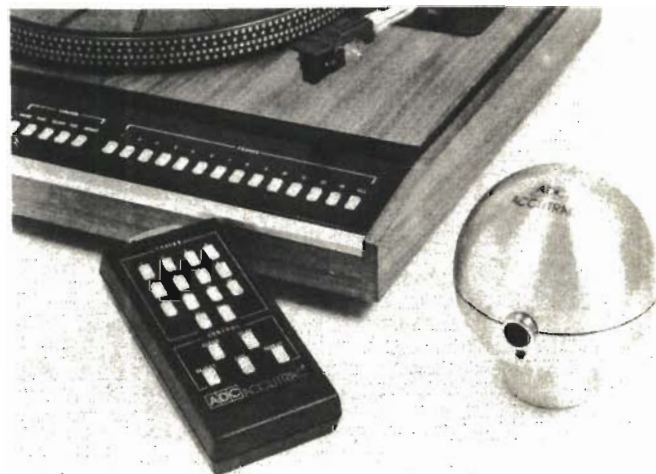
a small electric motor and drive mechanism which can accurately position the pickup over any part of the record surface and raise and lower it as required: it is a feature of this automatic machine that, once the stylus lands in the selected groove, the arm operating mechanism is completely uncoupled and so the bearing friction including the minute drag of the fine lead-out wires is the only restraint.

The headshell is also adjustable but this is not a requirement in this machine for there is only one appropriate cartridge, the ADC LMA1. This is a derivative of the well-known and widely accepted ADC XLMII and measurements on my sample were typical of others made on XLMS over a period of years. (Both channels showed less than 3dB variation over the range 20Hz to 20kHz and mid-frequency crosstalk around 35dB). However the LMA1 uniquely incorporates the 'eyes' of the Accutrac, a tiny source of deep red light focused down on to the disc and an equally tiny light detector which looks to see if there is a direct reflection from an ungrooved part of the record surface or only a scattered return from the angles of grooves. Another of the four knobs adjusts the sensitivity of this device and the remaining one is a power on/off switch: so, with those out of the way, I am left to describe the functions of the twenty-three buttons.

The automatic functions

The finger-touch buttons are divided into three groups. Four at the left are obvious, selecting speed, 33 $\frac{1}{3}$ or 45, and size, 7-inch or 12-inch (18 or 30cm). Fourteen at the right select tracks 1 to 13 or all; these are used to programme a 'memory' which can hold a total of twenty-four selections in any order. With them you can play the items on a banded record in any order you wish, repeating as you wish, or returning to a previously played band. This can be done at leisure and the selection will remain stored until the unit is turned off or the memory deliberately erased. The first of the centre group of five buttons labelled Clear is for this purpose and the second, Play, initiates the chosen sequence. If you have made a bad choice, the Reject button passes you on to the next item in your selection and, if the telephone interrupts, the Cue button lifts stylus from groove and returns it on a further pressure. Lastly, if you resented the interruption and would like that item over again without destroying the selected sequence, the Repeat button will come into action. To the uninitiated, all this smacks of magic and even the technically aware must regard it as diabolically clever, but it is just another example of the way large scale integrated circuits can alter our lives: and, to rub it in, Accutrac 4000 has one more trick.

Included in the Accutrac carton is a grapefruit sized, brushed aluminium sphere with a



This close-up shows the remote control unit and the sphere which receives the remote instructions; it gives an idea of the wide range of functions offered