



Hifi Review

Sharp VZ-3000Z combination system

Many of our readers must be wondering about the standard of hifi reproduction available from some of the latest feature-laden combination equipment which seems to be intended more for the average consumer than for the hifi enthusiast. So we decided to review the highly innovative Sharp VZ-3000Z combination system which plays both sides of a record in the vertical mode. The result was that we were pleasantly surprised at the high standard of performance.

The complete VZ-3000Z System comprises three units — a main cabinet, measuring 597mm wide x 378mm high x 173mm deep and standing vertically; and two matching loudspeaker cabinets, each measuring 220mm wide x 378mm high x 220mm deep. Each loudspeaker cabinet is of the bass reflex type, and contains one 160mm woofer and one 50mm tweeter. Mass of each complete loudspeaker cabinet is 4.7kg.

Contained in the main cabinet are a record player, AM/FM tuner, cassette tape recorder, selector switches and tone controls, and stereo power amplifier. Mass of this unit is 14.6kg. Not only does the tuner cover the usual AM and FM broadcast bands, but it also covers two shortwave bands — from 2.3 to 7.3MHz, and 7.3 to 22MHz. Thus the VZ-3000Z System is a truly versatile instrument, which could be described as a complete "home audio entertainment centre".

As can be seen from the front view, the record player is located on the left hand

side of the front panel, with its row of eight pushbuttons arranged vertically just to the right of its door. Pressing the top button activates a motor which opens the hinged door, taking some seven to eight seconds to perform the operation. The fully open door is inclined at an angle of approximately 45° to the vertical, making it a very simple operation to insert a record, similar to inserting a cassette into a front-loading cassette deck. The VZ-3000Z accepts 18cm and 30cm records and sets spindle speed according to diameter of record.

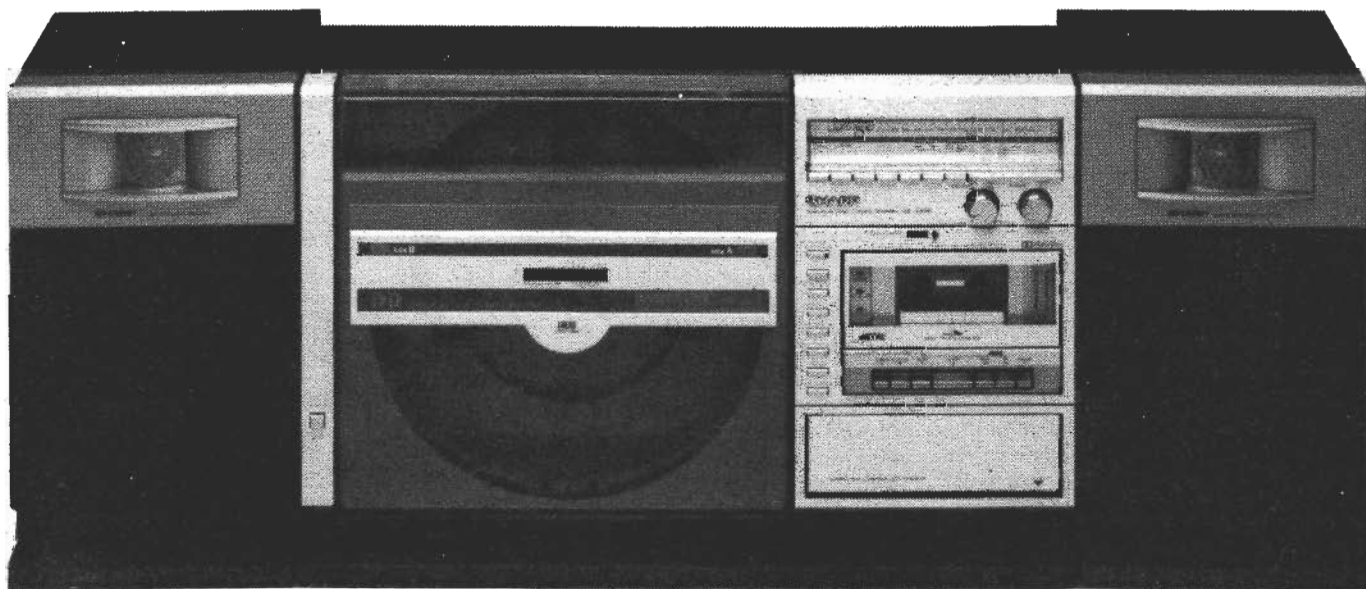
An internal flap, moulded from a high impact plastic material (as are most constructional parts of the main cabinet), moves slightly outwards as the door opens. The lower half of this flap is contoured into two semi-circles, one to match 18cm, the other 30cm discs. These serve to position the record, such that as the door closes, the tapered spindle enters its centre hole. Mounted on this spindle is a disc, approximately

85mm diameter, which locates the B (reverse) side of the record. A companion disc, positioned in the centre of the lid, meets the spindle as the door is closed. This disc is self-aligning and spring loaded, and as both discs are faced with rubber rings, the record is securely clamped between them.

Being only 85mm diameter, the two discs cover only the label area of a record. Two pickup cartridges — one in the right hand side of the lid; the other in the cabinet itself, just behind the left side of the record — are mounted on linear parallel tracking mechanisms, driven by a single motor. Drive to the "front" mechanism is via a concealed nylon cord (running over low friction pulleys) from the cabinet-mounted motor.

Thus both cartridges move across the record simultaneously; however since individual solenoids control the engagement/retraction of each cartridge, only one side of the record is being played at any one time. This is as it should be, with no additional stylus or record wear being incurred, although stylus pressure would be greater than with top-of-the-line record players. We were unable to measure the exact value, but would guess that it lies between three and five grams.

At this point it should be noted that the previously mentioned "flap" is contoured for minimal contact with the record surface, and is withdrawn prior to the spindle drive motor being started, so that records are not damaged in the



loading process. Similarly, the drive motor is stopped prior to opening of the door for record withdrawal. In addition, the 45° door opening ensures plenty of clearance for the insertion and withdrawal of records with even the clumsiest of fingers.

Styli of the pickup cartridges are quickly detachable, making replacement simple. However, the cartridges themselves are unique to Sharp, making substitution impractical. Sharp state that they are VM type, which is a high impedance magnetic design.

As previously indicated, operation of the record player section is quite simple, being somewhat similar to the operation of a cassette deck. The vertical row of pushbuttons provide the following facilities:

- door open/close. First push opens the door, the second closes the door. Operational time is seven to eight seconds in either direction. The "close" command also initiates start of play, whilst the "open" command both retracts the cartridges and stops the drive motor.

- play/cut. The first press lifts the cartridge and moves it back to its "parked" position. The second recommences play from the "start".

- cue. Similar to a cassette deck's "pause" button, the first press lifts the cartridge from the groove (but maintains its radial position), the second lowers the cartridge back onto the record.

- forward. Push to move the cartridges towards the centre of the record. Play recommences where the button is released (somewhat similar to the "fast forward" function of a tape deck).

- reverse. Push to move the cartridges towards the outside of the record. Play recommences where the button is released (somewhat similar to the "rewind" function of a tape deck).

- both sides play. Depress this button when it is required to automatically play side B after side A (or side A after side B). To indicate this function a curved green line with an arrowhead (located just left of the centre of the lid) is illuminated.

- repeat. Depress for automatic repeat (continuous) play of side A, or side B. Indication of this function is from an illuminated elliptical green line with two arrowheads, located just right of the centre of the lid. If both this button and the "both sides play" button are operated, both sides A and B are repeated, eg ABABA...

- side A/side B. Press to change side A play to side B play, and vice versa. Note that illuminated coloured panels are located on the ends of the strip in the centre of the lid; that on the left indicating side B (play) in orange, that on the right side A (play) in green.

From the above it will be seen that these controls provide for virtually all playing needs, with the microprocessor executing the commands in exemplary fashion.

In the lower right hand corner of the VZ-3000Z's front panel is a hinged flap, behind which are located tone and balance controls, record level (for the cassette deck), and microphone volume – for the two supplied microphones. Also located in this area is another pushbutton labelled 33/45, which changes the "turntable" speed. Normally this speed is automatically set according to record size, eg 33½ rpm for 30cm, 45 rpm for 18cm. Pressing the 33/45 button will accommodate those records which have been recorded at the converse speed. After use the speed automatically reverts to normal upon removal of the "special" record.

As previously indicated there is no visible turntable (we did not dismantle the cabinet to inspect the coupling between the motor and drive spindle), so we were curious to measure the wow and flutter of the VZ-3000Z. Peak was 0.1% DIN weighted – certainly a better performance than we have obtained from some turntable "separates". Full marks, Sharp.

Setting the tone controls to the nominal "flat" position, and measuring the output across dummy resistive loads (in lieu of the loudspeakers), we found the frequency response to be within ±1.5dB between 60Hz and 12kHz – another commendable performance. Response was –5dB at 30Hz, –4dB at 14kHz and –7dB at 18kHz.

By advancing the treble tone control to provide a little high frequency boost, an even better high frequency performance should be obtained.

Crosstalk was better than 20dB between 100Hz and 5kHz, falling to 15dB at 60Hz and 18dB at 10kHz – a more than adequate result. EMI stereophonic test record TCS-101 was used for both the response and crosstalk tests.

We measured the signal-to-noise ratio below a lateral recorded level of 5cm/sec at 1kHz (which corresponds to the nominal lineup level for 30cm LPs). It varied between 56dB and 62dB depending upon which of the four pickup channels were being checked (remember there are two cartridges, each with two channels). Allowing for the normal 10dB "peak factor", this corresponds to a dynamic range of 66 to 72dB.

The tuner section of the VZ-3000Z is situated in the top right hand area of the front panel, and features an attractive "straight line" dial with an illuminated cursor. Just below the right hand end of the dial are two knobs for volume control (all sources) and station tuning. As one's fingers tend to slip on the tuning knob's smooth surface, and there is no "flywheel" assistance, we felt that a knob with serrated edges would be a worthwhile improvement.

Located in the lower left hand corner of the tuning dial is a five LED bar graph RF signal strength indicator, which is fast becoming standard for FM tuners. Its

response, together with the limiting and quieting curves, is shown on the accompanying graph. Note that the 50dB quieting point is attained with 3μV input on mono, and 50μV on stereo. This compares very favourably with results we have obtained from top line tuners. Only in ultimate quieting (where the figures were 66dB mono and 57dB stereo) does the VZ-3000Z lose out to more expensive separate tuners.

No "muting" control is provided, and when tuning between stations in the FM MONO mode, background noise is quite audible. However, in the FM STEREO mode this interstation noise is muted since the RF input signal drops below the "stereo threshold" (ie, unlike most other FM tuners the VZ-3000Z does not revert to mono operation when the signal level drops below the stereo threshold).

19kHz suppression was 46dB down, whilst 38kHz suppression was greater than 60dB. The residual 19kHz is of no practical consequence since the inbuilt cassette recorder incorporates a built-in notch filter which is permanently in circuit.

Frequency response of this tuner was very good, being within ±0.5dB between 20Hz and 12kHz, and only –2dB down at 15kHz. The separation between channels was better than 34dB between 100Hz and 8kHz, changing to 30dB at 50Hz and 10kHz, and 24dB at 15kHz. We obtained distortion readings of 1% at 100Hz, 0.7% at 1kHz and 1.5% at 6Hz in the mono mode; whilst in stereo the respective readings were 1%, 0.9% and 2.3%.

But while the FM section is of a high standard, the AM section is nothing to get excited about, although it is on a par with most AM/FM tuners. And, as previously mentioned, it does cover two shortwave bands which is a feature. Performance on these two bands appears to be more than adequate for normal shortwave listening.

A row of eight pushbuttons is situated just below the left side of the tuning dial, and is used for input (source) selection. Sources are PHONO, TAPE, AUX, FM STEREO, FM MONO, MW, SW1 and SW2. The auxiliary input is connected to a DIN socket which is located on the rear panel. In normal fashion, "selected output" is taken to this socket (via series 100kΩ resistors).

The cassette recorder section is of conventional front loading design with "soft touch" controls. Mechanical operation is very smooth; in particular the EJECT function produces one of the most satisfactory door opening actions we have encountered, due to optimal damping of the mechanism. Conforming to standard practice for medium-price machines, the VZ-3000Z has the usual combination record/replay head with switchable electronics and Dolby-B noise reduction circuitry.

Control follows normal lines, except that one must remember to depress the TAPE selector button as well as the PLAY

Sharp VZ-3000Z disc combination system

button in order to listen to a cassette. [During testing this reviewer was constantly forgetting to do this when changing from the RECORD mode (via STOP and REWIND) to the PLAY mode.]

Tape speed was spot-on, with peak wow and flutter measuring 0.09% DIN weighted. Fast forward and rewind times were each a little over 100 seconds for a C60 cassette.

At first sight the vertical bar graph level meters, appear to have ten segments but in reality, there are only five segments, as each LED simultaneously appears in two "windows". Calibration points are at -13, -8, -3, 0 (with Dolby symbol) and +3, with accuracy better than $\pm 0.3\text{dB}$. With such coarse graduations it is difficult to accurately set levels when making live recordings, although one can probably get by when copying professional material, since the levels will have already been adjusted.

A Dolby-B reference level (200nWb/m) cassette played back at the Dolby mark, giving approx 150mV open-circuit output from the DIN socket. However it should be remembered that the internal output impedance at this socket is 100k Ω . Replay frequency response was within 2dB to 6kHz, and 5dB down at 10kHz.

As there is no variable HF bias control, we used cassettes specifically recommended by Sharp for the overall performance tests. They were Maxell UD (IEC type I), Maxell UDXLII (IEC type II) and TDK MA (IEC type IV).

All three cassettes produced essentially the same overall frequency response; within $\pm 2\text{dB}$ between 50Hz and 15kHz, and dropping to -7dB at 30Hz. Above 15kHz the response fell away sharply (approx -18dB at 17kHz) due to the effect of the MPX filter.

Overall distortion figures were essentially the same for all three cassettes. At a recorded level of 160mWb/m at 1kHz, distortion measured 1.2%; and at 6dB above (nominal 320nWb/m) was 5% for types I and IV, and 6% for type II.

Replay of a previously recorded cassette showed distortion of 0.85% at the 160nWb/m level; 2% at +6dB and 3.5% at +8dB indicating that the replay channel is not overloading.

Unweighted signal-to-noise ratio below 200nWb/m was 51dB for the type I, 54dB for the type II and 53dB for the type IV. With Dolby B selected these figures improved to 58dB, 59dB and 59dB respectively.

The net result of these tape performance figures is that the cassette section is easily equivalent to most medium price separate cassette decks.

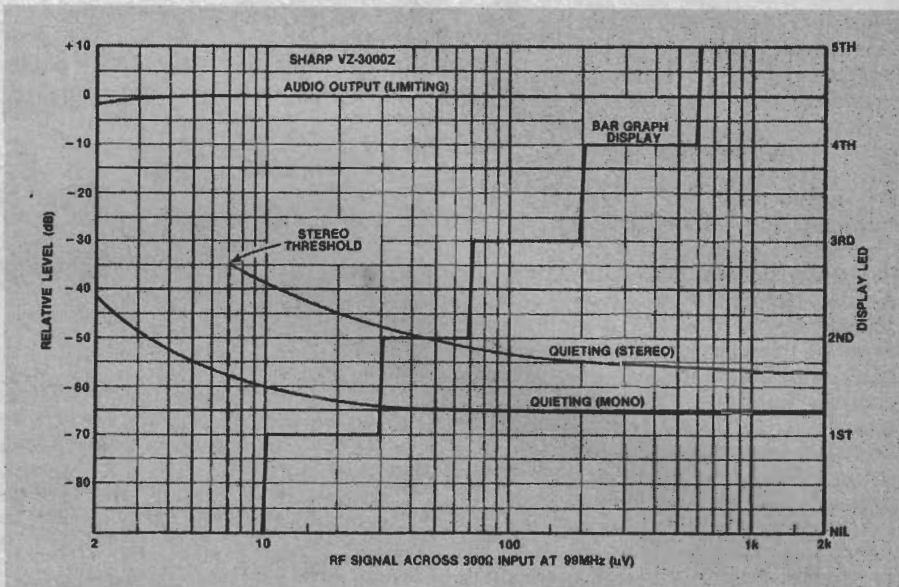
Unusual for mains operated equipment is the use of 4 Ω loudspeaker units. To drive into 4 Ω loads the power amplifiers must be designed to handle larger currents, and should therefore be

more easily able to cope with 8 Ω loads. And such is the case with the VZ-3000Z. At its rated output of 20 watts, the harmonic distortion was less than 0.05% at 1kHz and lower frequencies, and only 0.08% at 10kHz; readings which were essentially the same irrespective of whether it was feeding 4 or 8 Ω loads. However as an indication of the VZ-3000Z's ability to deliver high output currents the maximum power output at the onset of clipping, with both channels driven is 23 watts into 8 Ω and 30 watts into 4 Ω .

Tests for stability indicated no problems whatsoever, ie, the VZ-3000Z can be considered unconditionally

While the bass control can attenuate the response by up to 9dB at 100Hz and 15dB at 30Hz, maximum boost is 7dB at 100Hz and only 4dB at 30Hz. This characteristic of limiting the response below 50Hz appears to be a deliberate Sharp design feature (vide the record player and cassette deck low frequency response) with which we concur, particularly since the response of the supplied loudspeakers falls away rapidly below about 80Hz.

Actually the loudspeakers produce quite a pleasant sound although for critical listening the upper bass register is somewhat over prominent, with the lower bass register somewhat lacking. It



stable. Square wave response was also very good, although the rise and fall times were a little longer (approx 10 to 15 μs) than on some top-of-the-line amplifiers. However, its response to adding parallel capacitance across the load was perhaps the best we have ever seen. Whilst the wave shape altered as the capacity approached 1.0 μF and larger, there was virtually no "ringing" or damped oscillation as is usually encountered.

Unweighted signal-to-noise ratio of the power amplifier section was 84dB below 20 watts, corresponding to 71dB below 1 watt - a very good figure.

We took frequency response figures with the tone controls both set to 12 o'clock and found it to be within $\pm 1.5\text{dB}$ between 40Hz and 20kHz. Separation between channels was 52dB at 1kHz, and 35dB at 10kHz.

The treble control produces a symmetrical amount of boost and cut, amounting to some 9dB at 10kHz. A switched loudness facility is included a lifts the response by 3dB at 7kHz, and 5dB at 10kHz. It also provides a lift of 3dB of 250Hz, shelving to 6dB at 50Hz.

should be pointed out that it is quite normal for speaker enclosures of 15 litres (or less) to be less efficient in the lower bass region.

From the foregoing it will be seen that this Sharp VZ-3000Z is a most interesting design concept with its "both sides play" vertical record player, AM/FM tuner and cassette deck being combined into the one cabinet. It certainly produces a better than average performance in each of its functions, and provides a satisfying sound from its loudspeakers. Further, if at some later date, an improvement was desired, it would be quite simple to substitute better loudspeakers with the knowledge that the electronics performance is of a high standard.

Recommended retail price of the Sharp VZ3000Z "Both Sides Play Disc Combo System" is \$989 including sales tax, although we understand it will normally sell for around \$900. Further information and details can be obtained from retailers (note that the VZ-3000Z is not restricted to high fidelity outlets), or the distributors, Sharp Corporation of Australia Pty Ltd, 64-72 Seville St, Fairfield, NSW, 2165. (P. de N.)