



HARMAN KARDON

PM655

Despite all fads and fashions, it is still possible to buy a big, chunky integrated amplifier complete with tone controls and comprehensive switching facilities

by Paul Miller

It is more than a year since Harman/Kardon's Vxi range of integrated amplifiers supplanted the earlier HCC versions but with Sidney Harman a recipient of the '88 *HFN/RR* award for Achievements in Audio, a look at an amp that exemplifies the HK tradition seems most appropriate. The PM655Vxi is not the top dog in HK's current line-up but, ignoring an extra 60W of power, the only real differences between this model and the PM665Vxi are a couple of extra bass/treble turnover frequencies and a -20dB mute button! For £450 you get a heavy and well-built amplifier equipped with a fairly ordinary mains transformer (more often than not set to 220V rather than 240V), an upward facing heatsink and exquisitely crafted black alloy fascia. Dull gold legends complement the black to good effect and should help to prevent confusion over the row of six identical function knobs that populate the lower half of the amp.

These cater for balance, bass and treble adjustment with separate 220Hz/400Hz and 2kHz/6kHz turnover frequencies, and tone defeat also on offer. Other filters include 15Hz subsonic, 6kHz ultrasonic and a (reasonably) constant phase loudness contour. H/K has provided inputs for both m-m and m-c cartridges (selected by a remote-action switch on the fascia), CD, tuner, aux and 2 tape decks with separate

video buffers to ensure full A/V compatibility with VCR's. Comprehensive VCR/tape monitoring and independent rec-out facilities are available together with mono operation and some control over the input capacitance of the moving-magnet disc stage, useful for tailoring the HF response of unruly cartridges. Pre-out and main-in sockets enable the PM655Vxi to be configured as either a pre- or power-amp while the two speaker outlets are switched hard up against the rear terminals using a high quality coined-switch – certainly an improvement over the convoluted speaker switching employed in the cheaper H/K amps.

In a nutshell, H/K's amp philosophy concerns the use of wideband gain stages that are very linear under open-loop conditions and therefore require very little feedback. Hence under closed-loop conditions the dominant pole can be shifted to very high frequencies, maintaining a moderate and relatively constant level of feedback over most of the audio band. This ideal extends from the active-LF/passive-HF arms of the discrete disc RIAA equalization network to the two pairs of 150W Toshiba 2SA1302/2SC3281 bipolars used in the complementary output stage. In fact, the entire design is discrete and essentially dual-mono subsequent to the mains transformer, which feeds two S5FB20 encapsulated bridge rectifiers and two pairs of 6800µF reservoir capacitors.

H/K is also keen to optimize the output of the amp into a variety of loads and has fitted an 80hm/40hm speaker select switch on the rear of the amp. In 40hm mode, the amplifier's higher current output prevents premature limiting while in the 80hm mode the higher-voltage secondaries prevent voltage clipping into higher impedances. In practice, the impedance trend of a loudspeaker will vary enormously but will dip lower than expected under dynamic conditions, so it is probably better to stick with the 40hm setting.

Sound quality

Typical of an H/K amp the PM655Vxi offered a tremendously punchy and very clean presentation via CD, which displayed those most favourable aspects of the digital medium to best effect. Vocals generally benefited from a fine sense of articulation and solidity with very little in the way of added sibilance, a feature exemplified by the forceful and immediate portrayal of Tracy Chapman's *Mountains O' Things*. On the debit side, H/K's amp could also sound a little over-impressive or very 'hi-fi', with its extended and exuberant bass coupled to a lively and slightly prominent treble. As a result, bass lines bounded across with great enthusiasm while percussion rained down across a wide if not appreciably deep soundstage. This was certainly true when listening to Tanita Tikaram's *Singing Innocents*, which sounded sharp and clear, not uncomfortably bright but still a little icy throughout the upper octaves. On other occasions this coloration added a shiny glaze to the naturally rough and rich harmonic texture of brass instruments, for example.

With a slight flattening of stereo perspectives, the '655 failed to capture the delicate, fluttering ambience of some classical recordings. Although the amp is nominally accurate, the subtler aspects of the recording were lost, and the result was a dry, controlled but slightly 'soulless' performance. On the other hand, its uncompressed, transparent and unfettered delivery all contributed to a long term satisfaction that is rare amongst big-and-beefy integrated amplifiers.

Via moving-coil, this amp certainly sounded lighter but the forward poise of the upper mid/treble was traded for a loss of subtle detail and transparency. The upper mid was still slightly prominent but there was also a faint loss of the warmth and richness shown by the CD input. This was evident from the mildly smeared yet busy percussion heard in Julia Fordham's *Where Does The Time Go*. Again, a pleasantly open and buoyant sound pervaded, though without portraying the same stereo depth as superior amplifiers – the sound was raunchy and entertaining rather than concertedly accurate. Nevertheless the PM655Vxi did well with the warmer, flowing tones of Herbie Hancock's *Maiden Voyage*, the sound of muted trumpet clear and tactile with a stable soundstage.

The moving-magnet input definitely showed an improved sense of detail resolution and lucidity at HF, but was also thought fractionally colder and harder in presentation. The m-c input was just slightly softer (this ascribed to the reduced headroom) and the sound therefore seemed that much more approachable, less clinical but also less revealing in absolute terms.

Lab report

While there are undoubtedly some sonic benefits to be derived from the uniformity

of H/K's feedback, its moderate level has resulted in a fairly constant 0.025% THD at 1W through all inputs due to crossover non-linearities in the output stage, while the output impedance was only reduced to 0.12ohm, which in my view is not low enough. Distortion therefore decreases at an increasing level but remains fairly constant with frequency. Nevertheless while the m-m disc input benefited from a healthy +33.2dB headroom at 1kHz the m-c headroom falls from +28.7dB to +26.7dB at 20kHz. This might seem sufficient on paper, but with evidence of slew-limiting before 20kHz in the m-c head-amp, intermodulation distortion increases above 10kHz, thereby precipitating the 2nd and 3rd-order difference IMD products highlighted on the 3D ultrasonic distortion plot.

The 2nd, 3rd and 5th harmonics (a, b and c) are derived from the output stage while the IMD products $F_{20k}-yF_{0-20k}$ and $F_{0-50k}-yF_{0-20k}$ ($y = 1-2$) due to non-linearities in the m-c stage are denoted by (d), (e) and (f), (g) respectively. Supply modulation was also rife at low frequencies via the line input, the 40Hz ramp plot showing subsonic artefacts at 10Hz (-68.6dBV) and 20Hz (-61.5dBV) with a strong 2nd-order sampling product at 140Hz (-46.5dBV or -73.7dB relative to full output). In fact a clear IMD pattern emerged with products placed either side of the 100Hz rectifier harmonics: 140Hz/160Hz (h, i), 240Hz/260Hz (j, k), 340Hz/360Hz (l, m) and so on. There is also strong evidence of RF noise IMD from 200Hz-500Hz.

Both m-m and m-c disc responses were extended at LF, but demonstrated a peculiar -0.22dB sag between 50-500Hz before flattening out to 10kHz. The m-m stage was only 0.45dB down at 50kHz, by which frequency the m-c input had reached -2.45dB. On the 40hm setting, this amp raised 82W into 8ohms and 132W (+2.1dB) into 4ohms which fell by some 0.7dB with both channels driven. H/K's supply regulation is fairly strict, so the amplifier's dynamic headroom was suppressed to just +1.26dB, though the power bandwidth extended to an impressive 85kHz. Stereo separation was fine except on the m-c input which deteriorated to 50-53dB; input sensitivities were also good but A-weighted noise via the CD stage seemed a little high, particularly the -77dB at 1W.

Conclusion

Having evaluated several of Harman's most recent amplifiers, I would suggest that the technical shortcomings of the m-c disc input and supply modulation are areas for improvement. Nevertheless, the PM655Vxi rewards with an essentially open and unrestrained quality that allows music to flow convincingly rather than be forcefully ejected. Via moving-magnet or CD inputs, it offers a very tight, coherent and delightfully energetic sound that would surely blow the cobwebs away from any system in need of revitalization. If you are fighting shy of a separate pre/power combination then the integrated PM655Vxi comes warmly recommended. ↴

HARMAN / KARDON PM655Vxi

Graph 1. Harman/Kardon PM655Vxi: disc equalization accuracy

Graph 2. Harman/Kardon PM655Vxi: ultrasonic distortion

Test results

Maximum continuous power output, (one channel/both channels, W)	20Hz	1kHz	20kHz
8ohms	71.8	73.2	70.9
4ohms	98.6	113.1	109.3
2ohms		145.8	

Dynamic headroom (1HF)	+1.26dB (109.8W)		
Output impedance (ohms)	0.125	0.124	0.138
Damping factor	64.9	64.6	57.8

	CD/Aux	m-m	m-c
Stereo separation (20Hz)	88.4dB	86.5dB	50.2dB
(1kHz)	85.6dB	81.0dB	51.1dB
(20kHz)	72.3dB	60.3dB	53.6dB
Channel balance (1kHz, 0dBV)	0.02dB	0.02dB	0.02dB
(-20dBV)	0.10dB	0.12dB	0.14dB
(-60dBV)	0.28dB	0.55dB	0.75dB
THD (0dBV)	-71.6dB	-72.1dB	-72.1dB
(2/3 power)	-75.2dB	-74.7dB	-75.7dB
CCIR IM distortion (0dBV)	-76.5dB	-77.4dB	-52.3dB
CCIR IM distortion (2/3 power)	-76.4dB	-78.2dB	-52.8dB
Rise time/settling time	2.5µsecs/200nsecs		
Fall time	3µsecs		
Power bandwidth (<1% THD)	6Hz-85kHz		
Squarewave linearity	-94.3dB		
Supply modulation linearity	-75.7dB		
Phase shift (20Hz)	0°	330°30'	225°30'
(1kHz)	0°	309°36'	136°48'
(20kHz)	349°12'	266°24'	90°0'
Noise (A wtd, 0dBV)	-77.1	-76.6	-70.1
(2/3 power)	-89.1	-79.9	-73.3
Residual noise (unwtd)	-65.7	-65.9	-65.2
Input sensitivity (for 0dBV)	14.10mV	242.1µV	14.31µV
(for full output)	123.7mV	2.125mV	125.1µV
CD/Aux overload	>13V		
Disc overload (20Hz)	23.74mV	1.250mV	
(1kHz)	229.0mV	13.64mV	
(20kHz)	1885mV	109.0mV	
(50kHz)	3225mV	200.1mV	
Disc eq accuracy (50-15kHz)	-0.25dB	-0.18dB	+0.12dB
Pre-amp output/impedance	14.97V/1.161kohm		
Input loading	22kohm	50kohm	58ohm
DC offset, left/right	125-450pF		
Typical price (incl VAT)	-24.6mV/-36.9mV £450		

Supplier

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