

# "RICHER BY FAR..."

... is how David Windsor sums up the surround-sound, concert-hall musical experience now available from Ambisonic

For years the audio industry has experimented with the technology to reproduce more faithfully the ambience of the concert hall. They sought the Grail of that quality of sound it is impossible to experience without actually being in the auditorium with the performers.

Quadrophonic tapes and even discs were an ingenious solution, adding an extra stereophonic dimension to the two-channel information the drivers' ears have learned to live with. The artificiality of this approach, equipment costs and the likelihood that compatibility between radio, vinyl and tape could never be achieved, stifled quadrophonics almost at birth. The audio world stayed stereo but not without mutterings of regret.

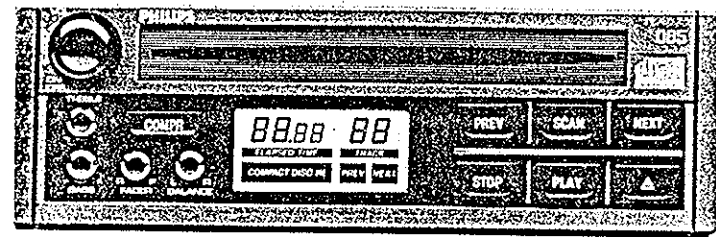
Stereo's imperfections come to a head inside the car. A sound's directionality is conveyed by the upper end of its spectrum,

frequencies which don't carry over very long distances and those most prone to absorption in the safety-padded interior of today's cars. Positioning of the tweeters - speakers designed to broadcast those high notes - is critical to extract the most stereo information. Inevitably that means pandering to the driver alone.

At any other seating position in the car the stereo image is confused either by the balance control setting or by the passenger's poor relationship to the speakers. Rear speaker systems - increasingly fitted as standard components in up-market versions of quite modest cars and a favourite mounting by d-i-y ICE installers - muddy the picture even more. No system provides more than a glimmer of the richness of sound that results from the clear directionality, combined with the many shifts of phase and echo, of an auditorium.



V6-powered concert hall... Troy's Ambisonic Alfa 90



Philips disc player reduces dynamic range for greater compatibility

boxed, twin-driven sub-woofer.

Clarion's introductions incorporate a lot of new thinking, which includes Diversity tuning and PRS on the new flagship 899MX model which replaces the older 980 unit. Below this £650 paragon lie other innovations such as the 940HP, 950HX and 960HX computerised anti-theft system (CATS) units priced at £270 to £390. Clarion's security encoding system is pre-programmed and car drivers are provided with a four-digit code obtained on a card for safe-keeping at the time of purchase. If the car's power supply is disconnected by removal from the car the unit becomes inoperable.

Clarion have rethought component systems, too, and are about to launch their compact 30 series which includes a highly featured tape deck at full DIN size and half-sized tuner and graphic equaliser modules.

As CD begins to make its impact, almost every company worthy of the car audio epithet has introduced speakers capable of handling the dynamic response and the power that is likely to be deployed with these new players. Recent speaker debuts have included

audiocore's flat honeycombaphragm range of 10 units, which are said to offer better sound radiation characteristics than normal trumpet designs.

And, among a new catalogue of speaker speakers - all buzzing to the words CDS-compatible and digital-ready - is the interesting air-way, surface-mounting 700 pod system priced around



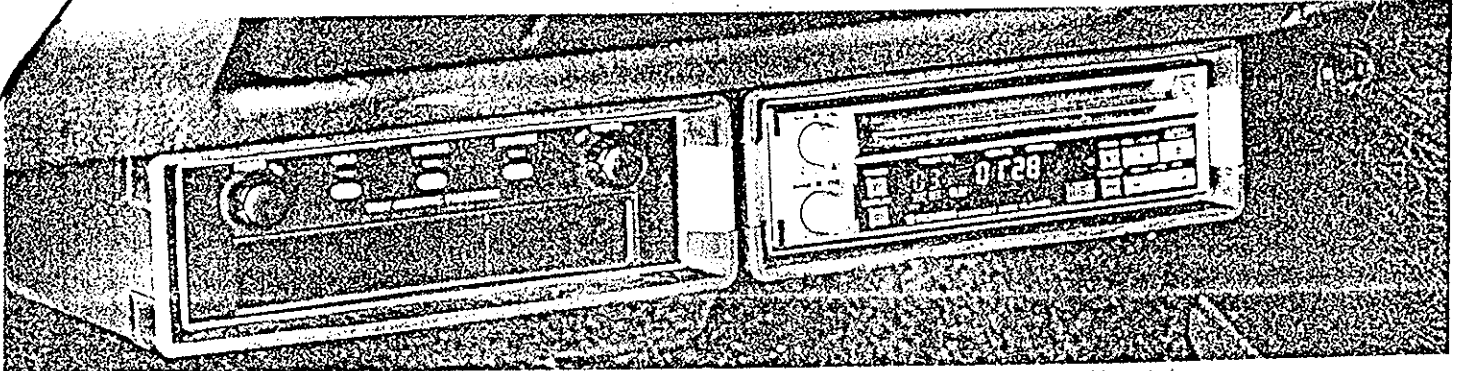
Digital-ready" TS-VX 700 150 watt speakers from Pioneer

£590 a pair! Possibly this represents a new record in speaker price levels.

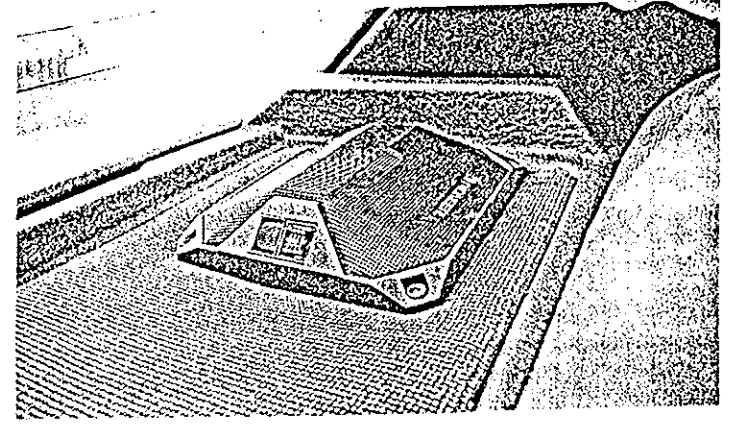
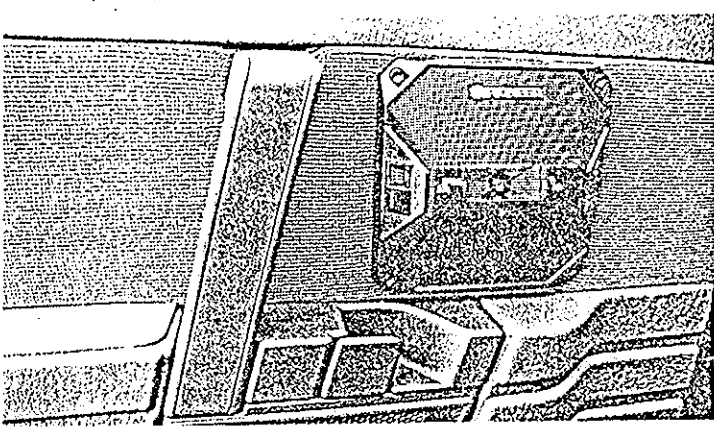
Amplifiers - more powerful and also more versatile - are arriving hand-in-hand with the CD players they are designed to support. Both Alpine and Trio have taken the view that they wish their amps to be matched to anybody's equipment. Hence both companies have new ranges with variable input sensitivity. Trio's recently launched top of the range booster is the 160 watts per channel £269 KAC 9020, but more interest will probably be shown in the newest additions to the range, the £189 8020 model giving 75 watts per channel and the £119 7020 model delivering 70 watts.

After a year of shake-out, most of the less stably founded ICE importers have left the arena to healthier concerns. Indeed, in a few highly specialised areas new names are starting to appear again.

Soundstream amplifiers are now being imported, for example, and Harman Kardon (see page 61) look committed to the launch of an up-market front-end unit in European tuner specification. Hitachi are said to be gearing up for a new onslaught on the closely fought middle ground of the business. New, higher specification equipment, better broadcasting technology and opportunities presented by both CD and the emergent techniques of Digital Audio Tape recording seem to spell a brighter future than the ICE consumer has enjoyed for several years.



Above: Ambisonic processor unit fits neatly into DIN-size under-dash panel alongside Pioneer's CDX-P1 compact disc player with control amp. Both door panels (below left) and rear shelf house Pioneer TS-1200 Tilt-Axial two-way speakers with HR (hydro-resistant) cone woofers



A development which provides at least a partial solution to many of these stereo ills was launched late last year by Troy Ambisonic. The culmination of more than a decade's work by the National Research and Development Corporation which combines technology from Britain, Japan and the US, the Troy Ambisonic system consists of a TA-110P processor module and an optional four-way 25 watts per channel amplifier, the TA-100W – both units modestly priced at around £90 each.

Several key Troy executives came from Pioneer, so the units are most compatible with the products with which they are familiar. However, by using some matching componentry the Ambisonic units can be made compatible with most head units, the processor connecting direct to the speaker outputs, feeding to the amplifier which connects to front and rear speaker systems.

Ironically, Ambisonic technology springs from the need to enhance stereo in the vast volume of cinemas – their multiplicity of seating positions making realistic imagery from a simple speaker system virtually impossible. By using a sound track encoded with processor instructions, multiple speaker sets could paint far better stereo images for people seated at any position in the hall. The encoded

instructions simply make very small adjustments to the phasing of the speakers. Like Dolby noise reduction codes, the instruction signals are inaudible and lend themselves to use on all broadcast and recording media.

NRDC, in conjunction with the BBC, have made two contributions to this development. The first is an agreed standard of encoding called the Universal H-matrix J-proposal, or UHJ, for use on radio broadcasts and recorded sounds. The second is a means to enhance today's existing unencoded stereo to create, artificially, a similar effect. Troy Ambisonic's in-car design is equipped with both types of surround-sound simulation.

Although the opportunities to enjoy UHJ are limited – only a few compact discs by Nimbus and some experimental tapes are yet available and the BBC's work has been confined to a few test broadcasts – interest by the recording industry is growing. *Motor's* test, in a car equipped with an Alpine source unit, Alpine front door speakers and a rear pair of Pioneer TS-2000s used only the "enhance" mode of operation. We also tried an all-Pioneer set-up in Troy's Alfa 90 demonstrator.

Installation to any existing system is extremely simple, the processor and amplifier taking the place of any other

components between the source unit (tape or CD player, or tuner) and the speakers. Adjustment takes only moments. The balance control on the source unit and fader on the processor are set to the driver's preference or to neutral with by-pass mode selected. The Enhance button is then set and the processor takes over automatically.

The Troy processor selectively phase-shifts higher frequency components of the sound between the front and rear speakers as well as adding a very small component of reverberation. The effect is quite extraordinary. Sounds lose their side to side stereo separation and in its place is generated an apparent all-around source of sound.

It is an exceptionally difficult sensation to depict in words. Indeed it is, for some time, a very confusing sensation to hear as familiar track after favourite passage progresses into wholly new dimensions. Once that is reconciled you are left with a feeling that you are indeed enjoying a far, far richer musical experience – rather more in the stalls of a performance than seated on the back row. What's more only very slight differences in this aura of sound spaciousness could be detected between the front and the rear seats if speakers are evenly matched and the balance and

fader controls are set to neutral.

Only one further adjustment is provided on the processor. A control labelled "width" seemed not to separate the left from the right by any more apparent space but to push the rear speakers further and further away. This appears to be a function of added reverberation rather than any addition shift of phase, as it certainly added depth to the music. When more UHJ encoded media are available it will be interesting to compare the Enhance and UHJ modes.

Theoretically UHJ moves the sound source like a ghost speaker around the interior under the control of the recording engineer, a technique which will clearly lead to some exciting special effects but may prove too artificial for use on familiar musical works. As it now exists purists can't complain too much about the artificiality that the fairly subtle enhancement creates. The system, without its companion amplifier, lends itself to patching into a more conventional audio rig provided that – from the processor onwards – the front and rear channels are kept completely separate. This facet of Ambisonic's device will win more fans for a development that seems certain to share the stage with mere stereo in the next 10 years.