

MiniM Ambisonic Decoders

Ambisonic Surround Sound technology is designed to recreate an accurate sound-field in the listening room - a replica of the original recording location. It gives a realism that is hard to describe without using hackneyed expressions like 'natural' and 'being there'. Positioning of the performer becomes obvious and the acoustic of the original environment comes through to the listening room.

Why is all this necessary - after all a portable radio can give a fairly good illusion of a musical performance. Stereo is even better enabling us to hear positions of performers on a stage quite well.

But in real life sounds come from all around us and an accurate reproduction of this cannot be achieved if we try to put all the sound energy in from one end of the listening room. This is why 'so called' stereo enhancement devices which only use two speakers never work very well.

A fuller description of how Ambisonic Surround Sound technology works is given in accompanying leaflets but from the listeners' viewpoint the most important consideration is that the system works and gives a more pleasurable listening experience.

In the Minim Decoders, great care has been taken to ensure high fidelity performance as well as surround sound reproduction. There is no benefit in having a poorer quality sound from all around. To this end components used in all Minim Decoders are high quality and very close tolerance so that the customer can be assured that his decoder meets the very precise design specifications. After manufacture, each decoder undergoes a rigorous test procedure involving over fifty measurements on our specially built test equipment.

An Ambisonic Surround Sound system requires a 2 channel source e.g. disc, tape or tuner fed in the usual way to a preamplifier which amplifies and controls the selected signal. The preamplifier's output is fed to the decoder (AD10,AD7) and the front and back decoder outputs are fed to power amplifiers feeding their respective loudspeakers. This assumes a separate pre and power amplifier system and these may be physically separate or an integrated amplifier which has provision for electrically separating them on the back panel. In either case, the preamplifier section volume control is the master gain control for the whole system.

Ambisonic Surround Sound Decoder AD10

A decoder with a very high technical specification that incorporates all the currently available facilities in Ambisonic Surround Sound technology. It will accept UHJ encoded 2 channel signals from sources such as record, tape or tuner and 3 channel B format input signals suitable for professional playback systems. These will be decoded into signals for feeding to a four speaker system. A layout control compensates for different speaker arrangements and is continuously adjustable between aspect ratio 2:1 and 1:2. The circuit elements used are designed for minimum in circuit crosstalk. Where speakers are placed more than 3m from the listener a distance button compensates for the different ways in which wave fronts travel at low frequencies.

Two special controls are included on this model. FOCUS allows the listener to make

alterations in the soundfield as heard in the listening room which enables him to focus more easily on details in the front sound stage. POSITION gives more weight to sounds from the front or back, depending on the switch, so that the listener may, effectively move himself forwards or backwards in the 'concert hall'. An example of when this might be used is in the relay of a live concert where FORWARD POSITION would be applied during the music to reduce the audience coughs etc and BACKWARD POSITION at the end so that the listener felt more part of the audience.

With normal stereo sources the STEREO ENHANCE control can be used to widen the sound stage from a central mono image to a complete surround picture. With classical music the enhance control can be used to provide an illusion of ambience which is most pleasurable. With pop music, effects can be created to provide greater involvement for the listener in the music.

There is a stereo BYPASS switch so that conventional stereo playback may be irade through the front two speakers without having to disconnect the decoder. An omnidirectional signal is available to feed sub-woofers.

The circuitry used in the AD10 has been optimised for the most accurate Ambisonic playback and highest quality sound reproduction. Special versions are available to meet monitoring and professional requirements and a conversion for six speaker layouts will be available.

Ambisonic Surround Sound Decoder AD7

For listeners who wish to enjoy the benefits of Ambisonic Surround Sound but do not require all the available facilities the AD7 will be suitable. Smaller in size it decodes UHJ 2 channel signals and B format signals. It also has the stereo enhance facility with the amount of extra width adjustable by the listener using the stereo enhance control. So that the listener can return to conventional 2 speaker stereo without disconnecting the decoder a stereo bypass switch is fitted.

By minimising the number of controls we have been able to sensibly reduce the circuitry and not sacrifice the high quality components. A switched layout control compensates for different speaker layouts. The AD7 is capable of most pleasing musical results.

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Minim AD-10 Ambisonic Decoder

The Minim AD-10 is the most advanced (or should I say elaborate) decoder for two-channel UHJ and three-channel B-format Ambisonic recordings. It appears to be the best-performing Ambisonic decoder yet produced, and it includes several features which were not available on previous decoders.

The AD-10 is quite diminutive, partly because the power supply transformer is external, and partly because UHJ does not need logic circuits for superior performance. The color is sort of a "champagne tan", and the styling is simple and unobtrusive. Disassembly reveals a high-quality British product, which means that it is close to the best American quality. (I am told that my unit is actually a production prototype, and that current units are even more carefully assembled and finished.)



A row of pushbuttons controls power and mode. The AD-10 can be switched to Hard Bypass (a relay shunts the input directly to the output), Setup (a mono signal is applied to all speakers for balancing), Stereo Enhance (the degree of which is controlled by a front-panel knob), UHJ (2-channel decoding) and B-format (3-channel decoding). The relay bypasses the decoder when it is de-energized. Turning off the AD-10 thus produces almost instantaneous disconnection, so it may be switched on or off, even with the rest of the system on and the volume up.

Two additional controls, Position and Focus, have not been seen on previous Ambisonic decoders. The **Position** control allows one to change his relative position within the hall. In its "front" position, ambience diminishes and one moves "closer" to the orchestra. In its "back" setting, the opposite occurs. There is a central position that presents the recording "as is". This variation is achieved by adjusting the level of the X (front/back) signal which goes to the speaker-feed matrix. Note that there is no change in the level of the signals which actually feed the speakers. Instead, just the component which controls front/back directionality is altered. Listening verified that not only was the desired effect achieved, but that the coherency of the soundfield was retained.

The **Focus** control is more difficult to describe. There was no instruction manual with my decoder, but Minim's literature states that "Focus allows the listener to make alterations in the soundfield as heard in the listening room, which enables him to focus more easily on details in the front sound stage." I think I know what that means, but I'm not sure that's what I heard. As Focus was advanced clock-wise, frontal sounds seemed to become more vivid and three-dimensional, but also somewhat phasey. Since I'm not sure exactly what Focus does, or how it does it, I'll reserve judgment on this feature.

Like all UHJ decoders, the AD-10 includes facilities for three-channel B-format decoding, even though no commercial recordings or broadcasts are yet available. The "front end" of a UHJ decoder produces three outputs (W, X' and Y') which are slightly degraded versions of the original W, X and Y B-format signals. Since these feed a conventional B-format decoder, the designer need only add another switch position and three jacks to get B-format decoding. It adds next to nothing to the decoder's cost.

The AD-10 also includes another "free" facility that will be of interest to those with mini-speakers. If you've followed our articles on Ambisonics, you might remember that the W signal is the "mono" or omnidirectional component. This signal can be used to feed a subwoofer, since the lowest frequencies are not directional (that is, the ear has trouble locating the source). The AD-10 has a separate W output for just this purpose.



There is, alas, no remote control. However, the unit is small enough that one might be able to place it at the listening area. This, however, would require six high-quality, low-capacitance cables trailing on the floor. Wives have an irritating way of disapproving of such audiophile necessities.

The most valuable feature of the AD-10 is its Stereo Enhance control. Prior Ambisonic decoders (as well as almost every matrix decoder) have had some form of enhancement, but none, in this writer's opinion, have been anywhere nearly as useful or effective. The AD-10, by a wide margin, does the best job of extracting ambience of any non-delay device I have heard. And although the full-surround effects are still not what I would consider ideal, they are somewhat less foggy-sounding than those from SQ or QS decoders. (It is fascinating, on some records, to hear sounds coming *from the sides*, which one never hears from matrix decoder enhancement.)

With the enhance control turned all the way down, one gets normal stereo. As the control is advanced, the soundfield broadens, until at some point the ambience "pops loose" and fills the room. (Further advancing the control increases the ambience and will cause the sounds to surround the listener.) What distinguishes the AD-10's enhancement is the total naturalness of the effect. The ambience does not sound tacked-on; it and the direct sound are a coherent whole. There is no sense of "empty sides", which one often hears from conventional quad recordings; the ambience is seamless and complete.

Of course, the quality of the enhancement will depend on the quality of the recording. But the results with the best audiophile discs (such as those from Reference Recordings or Sheffield) are superb. The sound becomes not only more realistic, but less mechanical and artificial-sounding (even though we have passed the signal through additional electronics).

After all this, the AD-10's performance as an Ambisonic decoder is a bit anti-climatic. Generally speaking, the AD-10 does noticeably better what earlier decoders (the Integrex and IMF Electronics) did well. The most obvious differences are that the sound is a bit more transparent and less fuzzy, and that imaging is a bit sharper and more stable. Minim agrees (why not!) and says the improvement is due to superior-quality components and a beefier power supply.

For those who have never heard UHJ records, it is probably fair to say that no commercial recordings have ever captured such a natural sense of ambience as these. (One possible exception might be the quad tapes made by Sonar some years back.) My description of the way the decoder extracted ambience could just as well apply to the performance of the AD-10 decoding UHJ discs. The direct and ambient sounds, as they do in real life, form a coherent whole. The ambience never sounds separate or tacked-on, a common failing of matrix (and even discrete) recordings.

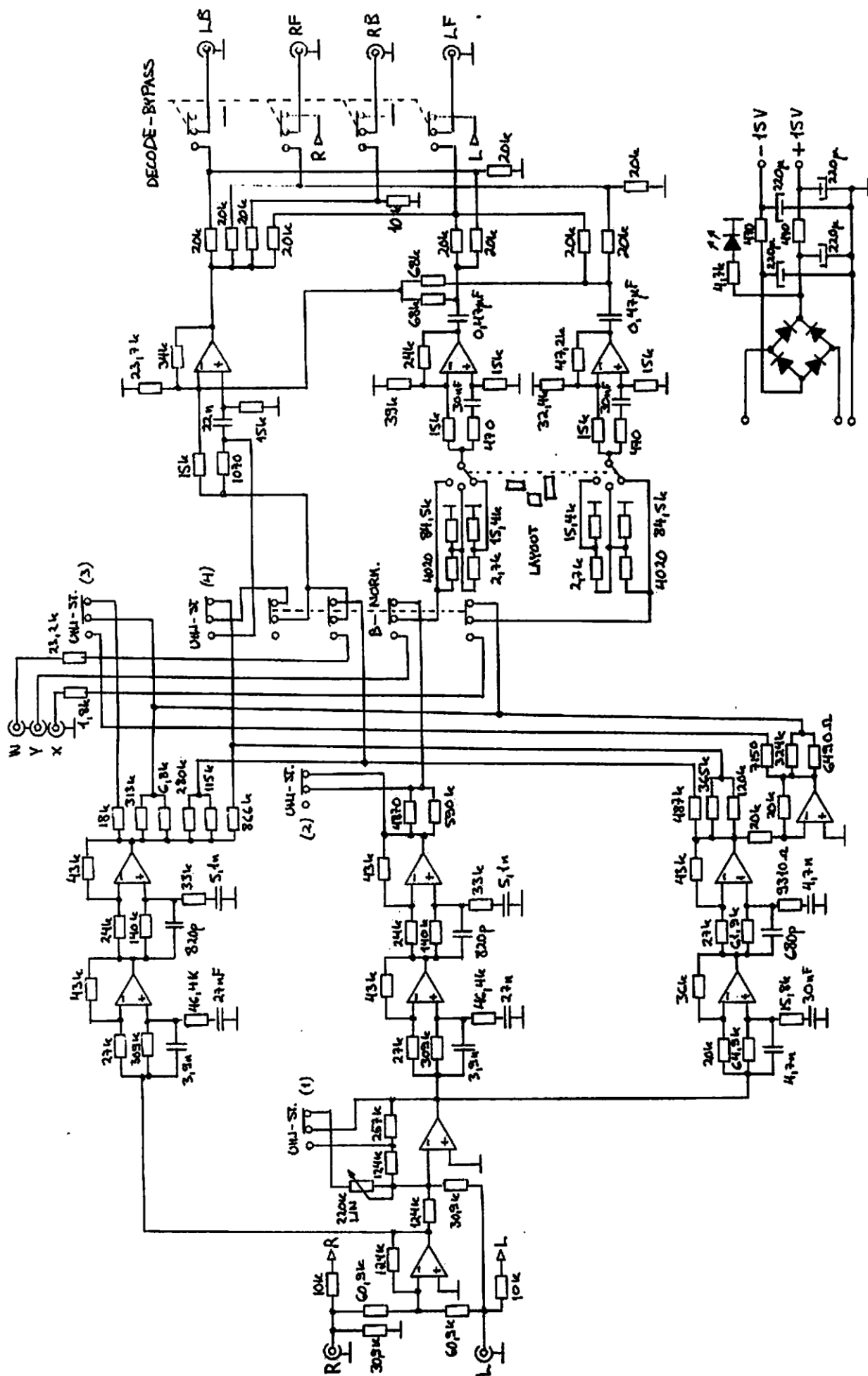
I also tried playing a Dynaquad record through the AD-10. Although it did not produce exactly the same directional effects as the Tate II (which isn't surprising, since UHJ and Dynaquad do not have the same encoding locus), the results were exceptional. Sounds that were supposed to come from the rear, did, and there was absolutely no ambiguity about it. (Note, again, that this level of performance is obtained without logic circuits.) Although I still prefer the Tate II for Dolby MP recordings, the Minim decoders (particularly the cheaper AD-7, discussed in a minute) make an interesting alternative.

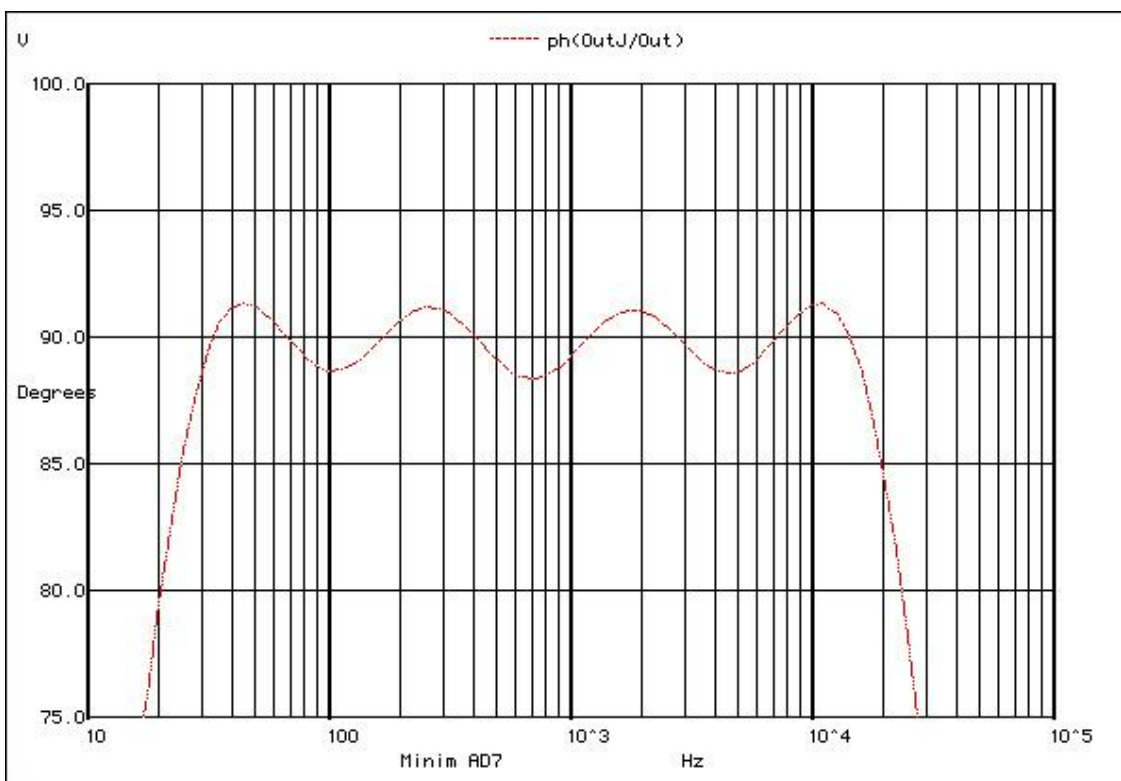
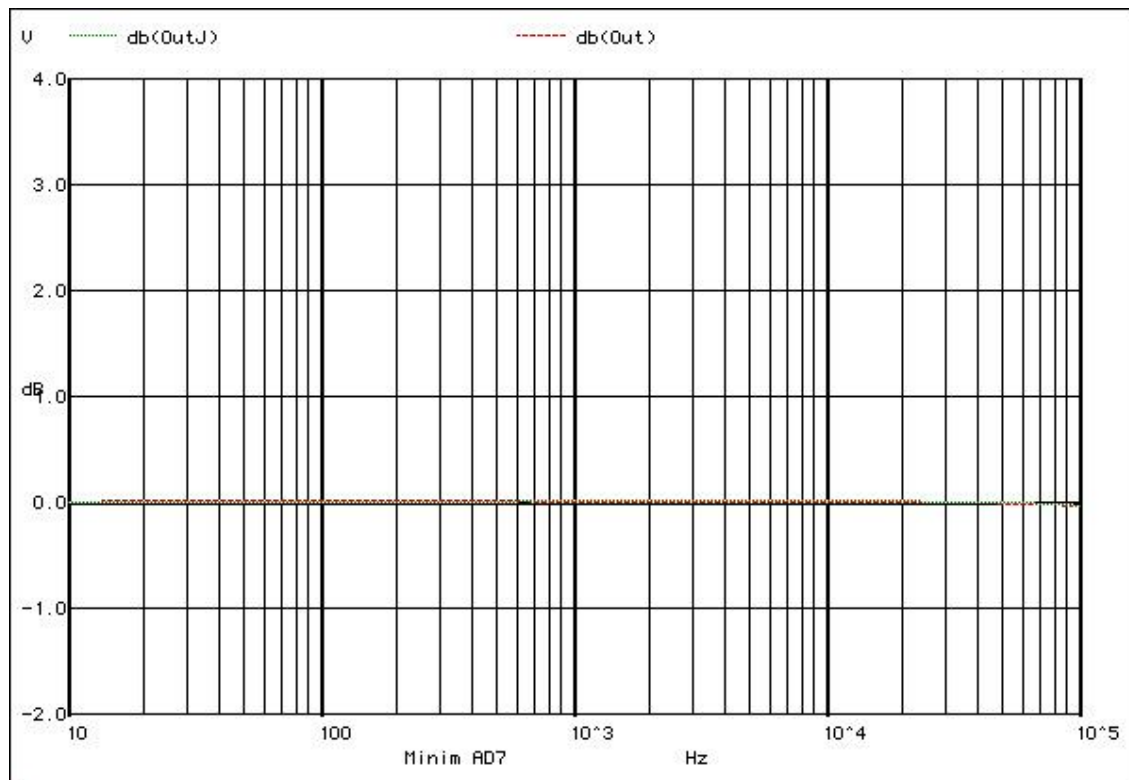
There are very few UHJ records with sounds placed behind the listener. But in reviewing these, I noticed something which points up one of the fundamental differences between Ambisonics and matrix systems. If a sound appears to be coming from behind you, and you twist your head in its apparent direction, the location hardly shifts at all. But with SQ recordings, the position shifts quite a bit. Think about it...

As we go to press, Larry is still deciding whether to carry Minim decoders in the "Record Shoppe". (He no doubt will have something to say about it elsewhere in this issue.) Minim makes a cheaper decoder, the AD-7, which is missing only the front/back Position and Focus controls; Stereo Enhance is retained. I haven't tested this unit, but I have no reason to believe it will not provide essentially the same level of performance as the AD-10.

Interestingly, the AD-10 will sell for about \$600, while the AD-7 will cost only \$200! Why the big difference in price, when there is so little difference in the units' facilities? For one, the AD-10 uses closer-tolerance components, which are then hand-selected! Minim wants the UHJ decode circuits to be as accurate as possible, and they feel that individual component matching is the only way to wring out the last drop of performance.

Second, the AD-10 is sold for a "fair" price; that is, the price fully reflects the cost of parts and labor needed to produce it. But the AD-7 is being sold at a very low price (not a loss, but one which would not be considered a fair return on investment) to entice people to buy one. Minim feels strongly enough about Ambisonics that they would like every serious listener to be able to afford one. This, in turn, keeps interests in Ambisonics and the sales of Ambisonic recordings going. Minim expects to make their profit when an AD-7 owner trades up to a fancier decoder a few years from now.





Minim AD7 Decoder Switch

__Ian Tait (ian.t at thoughtbubble.net) / Wed Feb 8 12:34:45 EST 2006: Hi, I've recently acquired a Minim ad7(?) decoder (says ad2 on the motherboard), and there is a rearward mounted switch that is not exposed externally. Any one have any ideas as to what it does, or a link to a manual or similar? Thanks,Ian.

__Eero Aro (arox at saunalahti.fi) / Wed Feb 8 14:21:36 EST 2006: Hello Ian, Do you mean the three position speaker layout switch that you can adjust with a screwdriver trough a hole in the front plate? I am not aware of any switches mounted rearward, or maybe there have been different models.

The layout switch should be set in a position, that best describes the layout of your four speakers. The centre position is for a square (1:1), the left position for a short but wide rectangle (1:2) and the right position for a long and narrow 2:1) rectangle.

The switch changes the relationship of X' and Y' signals into the four speaker outputs. In a way, you can think it as a length/width "balance" control. Eero.

__Ian Tait (ian.t at thoughtbubble.net) / Wed Feb 8 17:20:34 EST 2006: Hi, No, not the layout pot - on opening the box (seems its an early one judgin by posts in the archive - got din ins and outs) there is a switch unit, identical to the 2 forward facing ones (bypass and stereo/uhj), mounted in reverse on the motherboard, so you only get to see it when you open the box. It was in the 'in' position. Thanks,Ian.

__Eero Aro (arox at saunalahti.fi) / Thu Feb 9 12:52:19 EST 2006: I used to have a Minim AD7. There were three switches in it, in the model I had,they were all in the front panel: **bypass / decode; uhj / stereo; normal / b-format.**

If you have the two in front, could the normal-B-Format switch be in the back? Does your decoder have DIN connectors or RCA connectors? The early models had DIN connectors. Eero

__ Ian Tait (ian.t at thoughtbubble.net) / Thu Feb 9 13:19:28 EST 2006: Hi, I suspect you may be right about the b format - it's serial 103 I think from memory and also has din sockets. It also has 'Property of the NRDC' pantographed on the bottom. Can you remember whether the switch was in or out for b format? - what would non b format material sound like with b format 'on', I wonder? Cheers,Ian.

__Eero Aro (arox at saunalahti.fi) / Thu Feb 9 15:05:03 EST 2006: Well, with the switch in the front plate, at the "up" position, it is the "normal" state, in which the phase shifters are routed into the shelf filters (the end part of the decoder), with the switch pressed, to "B-Format", the B-format inputs are routed to the shelf filters, the front of the decoder (the phase shifters) are not in use.

If you feed a mono signal, like noise from your FM tuner, when you tune it between the stations, into the W input, which is pin 8 in the DIN connector, you should hear a same level mono signal from all four speakers. X is Pin 4 and Y is Pin 1.Eero

__Eero Aro (arox at saunalahti.fi) / Fri Feb 10 01:30:03 EST 2006: William Sommerwerck wrote: Like nothing at all. Switching to B-format decoding switches to the B-format inputs, as well.

In principle, yes. However, with AD-7, the left stereo input is fed both into the AB/MS matrix and the W-input. This is how it is at least in the later models of AD-7, after serial number 2750. Thus, you would hear the left channel of your stereo source played back from all speakers. I don't know if this feature was already in the early models. Eero