

# PINK FLOYD QUADRAPHONIC DIMENSIONS

EMI Recording Engineer **ALAN PARSONS** examines some unusual topics of studio recording and live sound engineering in Quadraphony with particular reference to his recent work in these fields with Pink Floyd



The author (top-right and bottom-left) working at various Abbey Road consoles. Studio at bottom-right is set up ready for a Pink Floyd session.

APPROACHING the quadraphonic remix of Pink Floyd's *Dark Side of the Moon*, their most recent album, was a task presenting technical difficulties of every description. But, in addition, there were initial musical constraints. Firstly, it was essential that adaptation to four-channel should not make it inferior to the conventional two-channel stereo version as a *musical* performance; nothing should be added, nothing taken away, so that apart from its existence in the quad medium it should sound musically the same. The original stereo reduction from a 16-track master tape was not without its problems: occasionally a track might be used only for a bar or two then replaced with another. These procedures had to be repeated for the quad mix whilst sustaining the necessary interest for 4-channel sound.

There are a number of methods for achieving results for the various quad reproduction systems. Firstly a four-channel discrete master can be made for optimum results on truly discrete tape systems. A further separate remix may then be made specifically for a chosen matrix system, whilst ensuring compatibility, so that pleasing results are obtained when the encoded disc or tape is played in stereo. Thus we need entirely separate production masters for the different systems. An alternative is to remix both

simultaneously so that the mixing 'performance' on the two versions is the same, though a few balance discrepancies might become apparent on encoding. Such methods have proved to be very practical where one is concerned with a moderately simple reduction. However, in a case where we might have several subsidiary tape machines running in addition to the multitrack master and our two reduction machines, we have the hardware problem to contend with; or rather the lack of it.

The quadraphonic remix room at EMI's Abbey Road studios is one of the best equipped in the country. However, if we have two tape machine delays for quad echo on two stereo reverberation plates, plus ADT (a tape method for simulating double-tracking), tape echoes and so on, we soon find ourselves running short of equipment. Another point worth raising is that should any editing be involved on reduction, we must duplicate every edit for each system. Crossfades, the blending of the end of one track into the beginning of the next, become even more involved as we need three 4-track machines (two to replay the original tracks, and one on which to record the result) for the discrete system, and then again three stereo machines for the encoded version.

One solution to these problems is to concern

ourselves only with the one discrete tape, though the way we monitor it is of great importance. A comprehensive monitoring system is essential. We must be able to monitor the 4-track before- and after-tape. We must have the facility to combine independently the four channels into an encoder and to hear the result decoded in quad; and also 'undecoded' (for want of a better word) in stereo. Although we may have to make compromises here and there, we do have the knowledge that our discrete tape, when later encoded, will give us an acceptable result. One might argue that this involves an extra tape generation, but we have thus saved ourselves a considerable amount of extra editing, crossfades, and separate playbacks. It is worth noting that if disc transfer rooms were fitted with advance-head 4-track machines and matrix encoders, this extra generation could be avoided.

EMI decided after intensive research to adopt the SQ matrix system. They felt that, of all the systems at hand, SQ was the nearest to being totally compatible, and they use it exclusively for all their quadraphonic disc issues. In conjunction with a good logic circuit in the home decoder, extremely good results can be obtained from SQ records. But, as with all matrix systems, SQ does have its limits. We have to avoid placing signals

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in the area between centre-of-the-room and centre-back, as these will be subject to level changes and phase cancellations upon encoding. Surprisingly, the absence of sounds from this area is not noticed a great deal, especially when one can 'pretend' the centre-room and centre-back signals exist when sounds are panned through, even though they might disappear momentarily under some conditions.

At no time was the original 16-track recording of *Dark Side of the Moon* monitored in quad, though a considerable amount of it was recorded with quad in mind. The ticking and chiming of clocks in *Time* for instance: originally these clocks were recorded separately in stereo at a local antique shop. They were then transferred to 16-track and synchronised so that the various mechanisms were made to strike at the same instant. This *mélange* was mixed to a quad picture on four tracks of the 16-track master.

The clunks and clicks on *Money* which alternated round the four corners of the room were made up from seven different sounds such as a cash register, money being dropped, paper being torn, etc, and recorded on the appropriate tracks of a 4-track machine. They were then edited together to form a continuous loop in such a way that an exact seven-in-a-bar sequence was repeated over and over again. This formed the basis for the rhythm track of the song. *Us and Them* involved a long repeat tape-delay for the vocal line. Each repeat returned to a different quad channel, and to achieve this effectively an 8-track machine was needed, running at a slower speed than normal, and using the delay from two record-replay stages for each repeat.

Can features such as these, which are so obviously effective in quad on record, adapt to a live stage performance situation? Sound systems for groups have come a long way in the last few years. At one time a mere two or three hundred watts through column speakers for amplifying vocals was considered an adequate power level for most purposes. The guitars and keyboards all had their own amplifiers, and drums were heard acoustically, without any assistance. Directional perception was purely natural: the sounds came from their point sources. The balance heard depended entirely on how the controls were set on the various amplifiers and the 'output level' of the drummer. Years ago, you might find an egotistic guitarist who would play through a pair of 200 watt amps into two 4 x 12 in. cabinets: 'I've got to play loud to get the feel man!' Little would he realise that if he played at this level no other member of the group stood a chance of being heard, especially with the electric guitar's sometimes piercing overtones.

Nowadays we have a situation where each musician can, within reason, play at any level at which he feels comfortable, the final balance and perspective being up to the PA sound engineer at the mixing console. Incidentally, most groups playing in large halls now have

consoles on multi-way cables so that the sound engineer can sit among the audience to balance the sound. This is obviously crucial to operating a quadraphonic PA. Even so, the engineer's job is made much easier if a well-balanced sound is being produced from the stage. Spillage problems are reduced, and as a result the sound can be more satisfactorily separated. Channel faders can be lifted and dropped at will with a minimum of effect on other channels; and this is again an asset if a quadraphonic PA is to work satisfactorily. Vocal microphones present the biggest hindrance to producing a tight sound. The relatively quiet signals they are subjected to contrast hugely with the enormous dynamics of the instruments directly behind them.

In many ways recording in the studio and mixing for a live concert go side by side. Every instrument carries its own microphone, and is treated separately for equalisation, echo and panning (in quad if we wish) and is subsequently blended with others to achieve a balance pleasing to the ear. There is, however, one limiting factor in the latter case—the annoying phenomenon of acoustic feedback. Again, vocal microphones are the first to suffer. Various manufacturers have come up with microphones which give a good 'proximity effect' to avoid the familiar howl-round. A good cardioid polar diagram is also essential, so that microphones can be angled away from the output speakers or vice versa. Experiments with two microphones in reverse phase can also help to alleviate feedback. In large halls where the PA can be placed further away from the musicians, the feedback problems would be reduced were it not for the fact that we have to work at a higher level to fill the hall with sound! This 'filling the hall' problem can be helped with a quad system, but it does present difficulties, as we shall see.

It is not generally known that Pink Floyd had been experimenting with 4-channel systems long before the word 'quadrasonic' appeared with the frequency it does today. 'Sound and around' was their name for it (and still is, on occasions). The 'Azimuth Co-ordinator' (an ultra-glamorous expression for a quad pan-pot) was splashed across publicity handouts. The group's present sound system consists of an 8000 watt stereo stage PA. In addition there is a vast quadrasonic system which is rigged in appropriate places for each concert hall. Such an enormous amount of equipment makes life very hard for road managers. Access to the stage alone can be difficult, quite apart from the necessity of humping huge speaker cabinets to heights of 100 feet or more at the top of U.S. auditoriums. It is therefore to the road crew's great credit that such involved systems can be set up and struck in a seemingly very short space of time; more so, of course, on tour, when timing is the very essence of making or breaking the performance. Pink Floyd's equipment on stage alone is complicated and delicate enough to give an electronic genius serious worries before a show.

Even to attempt to simulate a recorded quad sound for the live performance medium would prove disastrous. When you listen to Pink Floyd in quad on record, you do not visualise four individuals gleefully playing a hundred instruments issuing from every direction. You perceive it more as a concept or a picture in sound. However, people who attend Floyd

concerts, as they well know, expect far more than merely to sit back and listen. There is the whole visual aspect to consider. Quite apart from the staggering lighting and special effects skilfully provided by the members of the crew, there is no getting away from the fact that the people have paid to see the group in action.

The spotlight is on David Gilmour. The group stand knee-deep in dry-ice 'fog'. A flashy intense solo zooms round the four speakers. 'It must be on tape,' whispers an onlooker behind the console. It is true that many effects are used from a Teac 4-track machine to complement the group's performance, but, we have found through experience, an additional panning of extra solo instruments can be stunningly effective, especially in the more psychedelic passages. However, spreading the various instruments and sounds to a conventional quad picture simply does not work in a live show.

Depending on the size of our auditorium and where we are seated relative to the quad output channels, we hear the sounds from each speaker at different times. In very large halls this time delay can be as much as half a second—enough to make anyone cringe as drums clatter everywhere and senses of rhythm both from the stage and the audience are somewhat shattered. The only way 'live' quad can be effective is if it is used in relatively small doses to add impact, and only in sections of music where an acoustic delay might complement the sound, rather than where it would be a blatant hindrance to the 'togetherness' of a rhythm section.

Even recorded quad at home presents difficulties of seating position. Ideally one should be sitting at a point where the diagonals of front and rear speakers meet. This part is, of course, very critical, much more so than for stereo listening. At a live performance, with speaker stacks hundreds of feet apart, the ideal listening area is equally important but not so critical. Unfortunately the man in the concert hall box office does not sell tickets only for the small space which gives the best quad directional properties; so we have to make our sounds effective not only for those seated in the centre area, but also for those unlucky enough to be seated within a few feet of one quad output stack. This provides another good reason for using a live quad system subtly, if only for the preservation of the ears of those ill-fated few!

It would be interesting to make a quad record that was basically stereo, but which used the quad medium as an occasional lift to the music in appropriate places. Perhaps it would be criticized for its simplicity against others, but to fresh ears it might have more impact than a record which always has something happening on all four channels, even if it were only ambience on the back speakers. It might create an experience far closer to a Pink Floyd concert—at which the first sudden appearance of quadrasonic sound on a guitar solo in *Obscured by Clouds* invariably brings the crowd to its feet. But there are going to be many ways of exploiting the four channels—these are often only limited at present by musical imagination. Eventually, perhaps people will learn to work within the medium and utilise its enormous resources even more.

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