

And not forgetting...

Following on from the last issue's look at foldback and cue systems, we focus on the remaining components in the musician/studio interface. **KEITH SPENCER-ALLEN** ventures out on to the studio floor.

ASIDE FROM ALL THE OTHER changes that have taken place in studio recording, much of what is found on the studio floor – where the musicians perform – has remained fairly constant for the last 20 years. The hardware of mic and boom stands has been refined a little; DI boxes are a little more sophisticated with the continued enhancement of active designs; and microphone accessories are more likely to be neat commercial products rather than studio-made originals. This is one area that high technology has yet to influence.



What has changed is the sense of scale. Most recording operations are smaller. Few studios need 60-70 mic boom stands any more. Freed from the need to think in terms of quantity there is perhaps more scope for looking at specialised function.

There are actually only a few manufacturers of professional quality microphone stands in the world but a number of companies rebrand products for their accessory lists and this can give a misleading impression of choice.

In general, microphone stands are to be found in three different market areas – live, studio, and an economy range for light duty use. While the last of these is self explanatory, the major difference between live and studio stands is that live stands may have fewer points of adjustment and so are quicker to use, they may be lighter and more easily folded away, and they can require a different mix of models with more upright stands and solid bases, for example. The Economy ranges will double for both areas but will lack some of the variety, accessories and possibly be less robust. With quantity not being an economic driving force in mic stand choice, and the fact that the microphone on the end of the boom may easily cost 40-times the price of an average stand, cutting corners could be a false saving.



Most modern stands have three legs and are in practice far more stable than the four leg types that have now virtually disappeared. Most studio applications require a boom stand with a height adjustable between 1-1.5m with a fixed boom arm of between 70-85cm long. It is also useful to have a few stands with telescopic boom arms for use in tight areas – these offer a range of extension that is around half a fixed boom length to just under full length. Other useful variations are stands with upright heights above and



below the 'standard' size. König & Meyer offers a variety of low stands with a height of 30cm and a choice of fixed or telescopic booms making them ideal for miking a bass drum or a speaker cabinet.

The 'standard' stand very quickly becomes less stable when raised to full height while holding a heavier microphone on the boom. Beyerdynamic has an overhead mic stand in its ProLine series that has extra height and a longer boom intended for occasions where you want hang down at vocal height.

Stands that offer real height require large bases and counterbalancing weights and are available from companies such as K&M. Should you have to

consider supporting a multimic surround array that needs to be high and on an extended boom, it may be necessary to turn to a



They can't hear your screen

Really an article in itself, there are limits to what can be expected from acoustic screens. At best they offer a degree of acoustic separation while creating a very local acoustic character. Proper studios screens, not office baffles, can be quite effective in reducing the transmission of frequencies from about 800Hz and above but this depends on the size of the studio, the size of the screen, the screen construction, the height of the ceiling over the top of the screen, and the ceiling treatment.

In multimic recording, acoustic spill is often specifically noticeable due to acoustic delay or ambience on the spill caused by the distance of the offending mics from the louder sound source. Even a quite low level of snare or high-hat spill into mics 20 feet away can have an impact on the final drum sound. Even a small reduction in the level of spill may remove this effect and you can achieve this with well placed screens.

While the nature of the room will suggest whether it is best to use screens to contain a loud instrument or screen-off a quieter one, I have a preference for screens with a hard reflective side opposite an absorbent one. In many circumstances sound can be reflected into absorbent areas of the room by angled hard surfaces, rather than attempting to 'stop' sound.

more robust lighting stand and a custom adapted boom, for safety's sake.

One feature some companies offer is that of 'silent adjustment' – a coating on the boom arm reduces friction sounds when altering its position. While you wouldn't normally do this during recording it could spare your monitoring when adjusting an unmuted mic at other times.

One consideration when choosing a stand is the availability of spares. Many stand adjusters work by friction joint or screw fittings and eventually lose their ability to tighten or even get lost.

While most stand manufacturers appear to use a 3/8-inch thread for mic holder attachment, there is less agreement on the thread type that seems to be used on mic holders. It is essential that you acquire a large selection of thread adapters capable of connecting every permutation of 3/8, 1/2 and 5/8-inch diameter threads.

Most microphones are supplied with holders designed specifically for them. On most occasions it is best to stick with these because they should hold the microphone securely – this is particularly true of the larger heavier mics. However, the average microphone holder does little to isolate the microphone from vibrations travelling up the microphone stand. As the LF response of mics improves and there is less masking noise in the recording signal chain, low frequency noise transmission can be a problem. OK, there are always console high pass filters but impact noise, such as drums, can have higher frequency components that would require more extensive EQ work.

Almost all microphone manufacturers now have at least one suspension mount for a narrow and a wide bodied mic. While the techniques that they use to isolate the mic involve some use of rubber or elastic as a cradle within a rigid frame, I have no figures to substantiate which is the more effective. However, what is certain is that they are all better than none at all.

No matter how good the suspension is you still have to deal with the mic cable and its ability to transmit noise, and unfortunately it may be even better at this than the mic stand. A large cable loop between the mic and the first point of connection to the stand helps. Then there's the old film sound trick of putting a knot in the cable just before the mic – it provides a way for the vibrational energy in the cable

Stand up

Even if you are not expecting regular string quartets or orchestras, a few music stands are essential for holding lyrics or chord charts. They tend to fall (*Ooops! Ed*) into one of two types – the ultra lightweight fold-up design or the more robust permanent type. The former are fine for seated musicians but they become less steady when raised, such that a headphone cable or a careless foot can send them crashing onto a delicate instrument.

A heavy duty stand for vocal use is a good investment. They should support the weight of headphones hung on the corner and have a base that isn't going to interfere with more energetic vocal styles. One model that has found particular popularity in recording situations, despite costing around five times the basic type, is the RAT Opera stand. Apart from being robust and stable, the holding tray is open so it remains acoustically invisible to a close microphone. An optional lamp can fit over the tray for close illumination and, because music stands become home to coffee cups, lit cigarettes and chewing gum, RAT also offers all parts as spares.

The illumination issue is important if you're recording sight-reading musicians. So many studios have great mood lighting but find it difficult to provide a uniform high level of illumination. The music stand light adds cost but is probably cheaper and more versatile than a permanent installation of lighting of sufficient intensity for reading music.



to be made to do work and so dissipate before reaching the mic.

The studio used to be where the world of electrical musical instruments rubbed uncomfortably against the established standards of professional audio recording equipment – the unbalanced high impedance versus the balanced low impedance. This electronic apartheid ended during the 1960s, about the time that the studio was decreed to be 'just another musical instrument', and when the creative and practical reasons for taking direct outputs from electric guitars rather than miking the amplifier, became important.

An electric guitar was an unbalanced high impedance output while the mixing console was expecting a low impedance balanced input signal. The solution was the use of a matching transformer between the instrument output and the console mic input. In most cases the 'Direct Injected' musical instrument approaches the level expected from a condenser mic but can be more demanding in terms of dynamics and low frequency content.

The average transformer DI box has a high impedance unbalanced input and low impedance

balanced output plus a 'thru' output for feeding the instrument amplifier. There may also be a 'ground lift' switch to separate the signal earths.

While the most common practice is to take the direct output of the instrument, it is also possible to take speaker level signals and benefit from the sound character of the instrument amplifier pre-speaker. While this can be accomplished by a network of suitable resistors, more sophisticated passive transformer DI boxes can offer input attenuation for speaker level feeds.

While brands such as EMO and DIB offer 19-inch rackmount units with up to 8 passive DI channels for multiple interface requirements, the most practical unit in music recording applications will be the 'robust box'. The suitability of the unit in question must be viewed according to the expected rough and tumble of use.

While passive DI boxes benefit from simplicity and no battery, they may not present the preferred load impedance to the musical instrument and hence the output sound may be influenced. The alternative is the active DI box, which can more closely match the load expected by the instrument.

The simplest active DI units don't differ significantly from their passive equivalents in terms of features, with models such as BSS's AR133, Behringer's Ultra DI, and MTR's DI-3 offering a choice of battery or phantom powering, various levels of input attenuation, and slightly different output options. However, they do cover a wide range of pricing.

MTR and Behringer also offer rackmount 6- and 4-way systems. The MTR DI-6M also has a simple mixer

facility that allows the individual outputs to be mixed to a single balanced output if required. The Behringer Ultra-DI Pro takes several steps closer to being a preamplifier with the inclusion of gain, low pass filter, phase reverse switch and LED metering.

A possible problem solver for those difficult and complex sessions might be Smart Research's Smart Guitar DI system. Tackling more than simple DI work, it was initially developed for guitarists who

wanted to play in the control room but use an amp that may be several hundred feet away. It consists of two sections – a Transmit box with a high impedance input and a line driver, and a Receive box with a DI/splitter giving two isolated outputs, plus a speaker simulator input to take the speaker output of an amplifier. A deluxe version gives up to eight isolated outputs but both boxes can also be used as independent DI units. ■

DI extras

- It's a common technique to mix the direct output of an electric instrument and its miked amplifier to create a blend of the two. Before combining the two signals check the phase (polarity) relationship between them because it is common to find that they are opposite and partially cancel each other. The easiest method is to route the DI and amp signals to the same bus and set one of the inputs to an average level and then fade up the other. If the total level increases, they are in the same phase relationship. If it decreases, reverse the phase button on one of the inputs.
- Mixing a DI and amp signal can also be a way of controlling dynamics without making it sound like it. The DI signal can be compressed as required while the amplifier signal can be compressed less or not at all. The ear is drawn to the dynamics of the amplifier signal even though it may be of a much lower level, masking the compression on the DI input.
- DI signals tend to have fast attack and may sound too 'clicky'. Depending on the distance of the microphone from the amplifier, the DI signal will lead the amplifier mic signal slightly but the use of a minuscule delay on the DI input will hide that click under the amplified signal.
- The performance of a passive DI box is determined by the quality of the transformer used. While avoiding a discussion on the audible differences between different brands, it is certainly true that budget units may have performance shortcomings. These may be most obvious on bass guitar, which on a DI feed and in the right hands can be one of the most dynamic of instruments. Engineer Bruce Swedien, used to have a large floor standing transformer which he felt necessary to handle the extraordinary output peaks that certain slap/funk bass players could generate.

