



# DRIVING

# THE

# M10

Alvin Gold looks at Meridian's  
Top-line active speaker

**A** QUICK LOOK at the M10 will show why Meridian are one of KEF's best OEM customers – it practically sprouts drive units, and from almost every available surface. Somewhat surprisingly, then, the M10 is a remarkably civilised looking product, especially with its cover in place. It is also beautifully designed (given that you like Daleks) and has genuinely first-class standards of finish, making extensive use of real wood veneers.

The M10 is an active loudspeaker, or what Meridian prefer to call 'interactive'. In other words, it has built-in dedicated power amplification and electronic crossovers, to which the only access is from the preamplifier chosen to go with it. It is a large, free-standing speaker that needs breathing space in the listening room, and is therefore quite an imposing package unless the room is large.

You have to be pretty serious to think of owning a pair of M10s: the going price is some £2,000/pair, though this does include power amplification, of course. The only items you would need to add to make a fully working record playing system, for example, are a preamp, a record deck, arm and cartridge.

## Design and construction

The design brief for the M10 called for a louder and deeper M2, but without loss of the latter's most important feature: its directivity pattern. In essence the idea was to produce an apparent, or virtual, acoustic source smaller than the cabinet itself. Thus the bass is handled by four small drivers, two on each side of the cabinet, working in opposition (and thereby effectively cancelling any tendency for the cabinet to rock in either plane). This arrangement is augmented by a passive bass radiator to the rear, which is tuned to 33Hz, the cut-off point of the design. The midrange is handled by two drivers arranged symmetrically around the tweeter. Finally, the tweeter has a built-in 87µs delay with respect to the mid drivers, which is intended to push the apparent source of treble back into the cabinet.

The motive power of the beast is hidden in the stands, and is accessed either by balanced or unbalanced inputs at line level, making the M10 suitable for studio use. Four amplifiers are employed: 35W for the tweeter, a 70W for the two midrange units, and two more (70W) for the four bass drivers. Two 180VA power supplies, one for

the bass amps and one for the others, provide the energy.

The elaborate crossover requirements have received special attention. The 200Hz bass/midrange acoustic double-Butterworth crossover (24dB/octave) is designed so that the pitch-defining frequencies are kept away from the large excursion bass drivers, and to ensure that the bass operates effectively as a sub-woofer. The main part of the cabinet is, in fact, a self-contained bass enclosure with double ¾in. ply (not chip) walls and extensive internal bracing, with panel damping and internal foam to control the cabinets. The bass and midrange units are KEF B110/1057s (the high power-handling version) with a PVC surround and a high temperature voice-coil. The passive unit is, of course, the KEF P139. The midrange/treble enclosure takes up the front few inches of cabinet depth, and is filled with long hair wool.

The mid/top crossover is at the unusually low frequency of 2kHz, using similar slopes to the bass/mid. The determining factor here was Meridian's belief that this is the natural point to roll-off the midrange if the driver is to behave properly. The trade-off, of course, is that the tweeter needs to go lower in frequency than usual, and this resulted in the choice of KEF's large-dome T52. The reasoning is that the last half-octave or so of treble is of less importance than the area around 2kHz. There is also a lot of empirical and experimental evidence to suggest that 2kHz is the lower limit of that area where phase relationships begin to become discernable.

Bass alignment is 6th order below resonance (33Hz), and the directivity of the enclosure is designed to approximate to the dispersion of characteristics of a person talking. It is also more or less symmetrical in both vertical and horizontal planes.

## Measurements

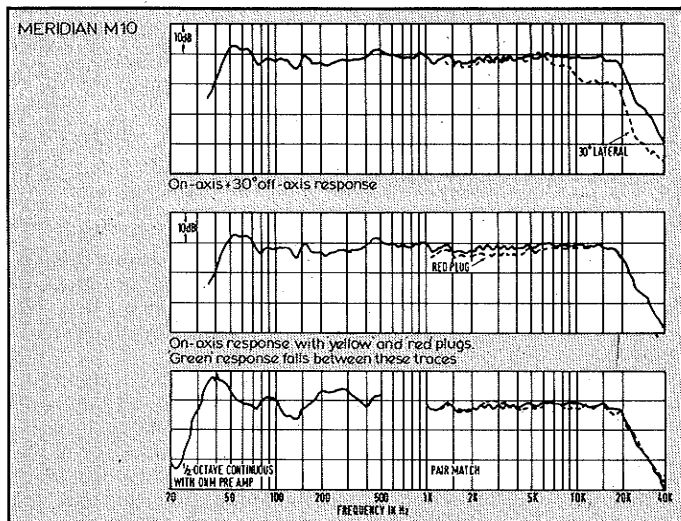
Most of the measurements presented here were done by Stan Curtis, using, in the main, B&K equipment. The exception is the in-room frequency response which I did myself, using Neutrik equipment.

Semi-anechoic measurements of maximum output are broadly in line with the claimed 110dB maximum music program output in a typical living room, and this certainly appears to correspond with reality – the M10s can go very loud indeed. Another observation, confirmed from the measurements, is the quite severe loss of HF on

a glancing axis due to the large, directional tweeter. No less than about 8dB loss of output above 12kHz was noted with the microphone positioned 30° off-axis.

The full-range frequency responses were made with the loudspeakers 2m above the ground level, and the microphone 1m above this; they show a well tailored and even response. Three response shaping 'plugs' are supplied, and the flattest response was achieved with the green version; this also gave the most satisfactory results in the room used for listening.

The final measurement is the in-room low frequency response. The aim here was to measure the LF response at a normal listening



position, with *both* speakers working at once. A 1/2-octave continuous sweep was run with the microphone placed 2.5m in front of a line between the two front panels, the speakers themselves being 1.8m from each other and 110cm from the rear wall, measured in each case from the tweeter position. The room itself is some 4.5 x 5m, the speakers being positioned along the shorter wall. Note that bass extends to well below 40Hz in this test (the -6dB point is just below 30Hz), the peaks and dips largely being accounted for by the effect of the major room dimensions, not the rear wall effect. The latter begins to make itself felt at 400Hz (see plot).

### System matching

It is no exaggeration to say that the M10 is more critically dependent upon the performance of the ancillaries used with it than any other loudspeaker system I can think of. And the choice there may be harder than you think. Other products – the Krell amplifier, or the Linn Isobarik loudspeaker, to give a closer example – also require the best possible systems to allow them to work optimally, but they still treat unsuitable ones relatively kindly. The M10s, on the other hand, literally murder the wrong preamp and turntable (or whatever source). An ill-chosen front end is easy enough to spot: the music reproduction acquires a relentless, forward 'grab you by the throat' kind of feel. In part this is because the M10 is a little that way inclined anyway and needs to be controlled.

The M10s were originally supplied with the latest version of the 101 preamp, a combination which quickly showed itself to be completely unsatisfactory. At the best of times I feel the 101 to have a hard, 'transistor' quality, and although a larger room, allowing the system more breathing space, might have helped, I suspect it would still not be enough.

The next try, and a much more successful one, was with the preamp of Meridian's new Modular Component Amplifier, which is now available without the power amps. This preamp is much sweeter than its predecessor and has a very tightly controlled sound, especially at the frequency extremes. This suits the M10 well, and the system settled down to produce a more transparent and relaxed musical performance.

I didn't stop there, though. I still had the nagging feeling that there was yet more to come, and was able to try a total of three other preamps: the Musical Fidelity ('The Preamp'), the DNM Primus and the Burmester 785 – I chose the latter because their advertisement claimed special suitability for the Meridian range.

To cut a long story short, the Musical Fidelity was not a great success. The M10 tended to sound over-sharp and 'over the top' in this combination – not a result typical of this preamp in other combinations, I should add. The DNM, though, was a great success. In many ways this system sounded the most unforced and musically transparent of all, though it didn't have quite the smooth, sweet, uncoloured feel of the Meridian. The more expensive battery-

powered DNM ought to be better still, but I was unable to find out during the review period.

The Burmester was the real revelation, though. I have to say that neither the m-m nor m-c inputs seemed wholly comfortable with the unusually high output (for a low o/p m-c) of the Koetsu Black cartridge I was using, and I was not able to eradicate completely a rather harsh-sounding, low level hum problem in the few days I had the preamp, though from conversations with the importer and Martin Colloms I am satisfied that it can be resolved. Despite these problems, though, the combination had all the qualities of a marriage made in heaven. For the only time during my period with the M10s I had no impression that there was a preamp in the circuit; the music just flowed naturally and the whole system was relaxed and comfortable, yet as sharp as a razor in terms of musical resolution.

I've said little about the front ends so far. I used a Linn/Ittok/Koetsu Black, which proved entirely suitable (brief experiments with the Rega RB300 suggested that in some ways, this combination works, better still). Whilst the Linn is not *de rigeur*, any alternative should be in the same class, performance-wise. I also used Compact Disc extensively – recent Sony and Marantz players – the Meridian extracting both the best (the LF cleanness and depth, the apparent resolution) and the worst (the often relentless, unresponsive way music goes loud and soft) from the medium.

Finally, note that for best results the M10s should be switched on at least an hour before use, and preferably left on permanently, being pre-conditioned with a few minutes' music if possible. They can be spaced well apart and need about 350-500cm of clear space behind them to sound at their best; the tweeter should point at the listener. Oh, and remove the grill cover! A racehorse of a hi-fi product indeed!

### The proof of the pudding

I make no excuse for spending so much space discussing system matching problems: with the M10 this is the key to musical Nirvana. Having got it right, though, the positive aspects of the product easily outweigh the negative, and music reproduction takes on a vivid, alive feel that very few other speakers can match. The M10s don't display the sleek euphony, the 'comfortable as an old glove' feel of some equivalently priced systems using smaller loudspeakers, but its ultimate capabilities are, in fact, much greater than you might expect.

A few words are in order about bass reproduction in general, since this provides part of the key to understanding what the M10 is all about. It has a subjective bass-resolving ability that goes down perhaps an octave below most of its competitors. This does not mean that other large loudspeakers don't have equivalently deep bass *in extremis*; rather that no other UK-made models I can think of, apart from the Linn Isobarik in PMS or DMS form, have the real, usable controlled bass of the M10 in a typical living room environment.

But it's worth remembering what it is we're trying to reproduce in the octave below, say, 60Hz. A lot of fundamentals from a variety of instruments fall within that region, of course, but in their absence the brain can, I believe, quite easily fill in what's missing by extrapolation because the upper harmonics have a linearly predictable relationship to the fundamental. As a result, little real information is lost. In support of this hypothesis I would add the following points: first, lack of very low bass adds a crispness to low frequency reproduction which aids intelligibility; second, most system/room combinations are particularly weak in reproducing clean, tight and tuneful bass. Leaving out the bottom octave eases the job and can help the system as a whole to sound better than it otherwise might. If you like, it does a more limited job more effectively.

All this, though, begs the question of what we want that bottom octave for in the first place. Indeed I asked that question of myself when I first heard the M10s some months ago, and the answer was not hard to find. Quite clearly the sort of information I was now hearing off records, which I had not been hearing so clearly before, was the kind of ambience signal clues that define the recording venue's acoustic characteristic or 'fingerprint'. For once, the almost tangible electric hush that surrounds a really telling musical performance is made accessible. These sounds do not enjoy the same kind of recognisable harmonic structure as musical information, so are not readily suggested by limited bandwidth speakers. This explanation is somewhat generalised, of course, but the fact remains that one of the M10's outstanding features is that it lays bare a whole layer or category of such information that is not ordinarily audible.

Bass reproduction, then, is at least part of what the M10 is all about. Its abilities in this respect are extraordinary. It has a combination of lean, taut and tuneful, yet powerful music-making in this region that allows the drumming on old rock albums (where the instrument isn't recorded taped up in an acoustically dead 'booth'), or the rasping cellos and basses on old Klemperer and Barbirolli Beethoven and Mahler recordings, to shine through. The M10

...olution possible with a properly

...quite satisfactory at typically -70  
...full level. This marginal shortfall is  
...nt state of D/A converters, since lab  
...nce approaching -100dB for this I/M  
...ducts resulting from single high  
...to -80dB range, above a 14kHz input  
...CM chain. However, via signal sythesis,  
...D/A convertor is already capable of  
...ell. We can thus anticipate further  
...over the already high standard of PCM  
...e coming years.  
...linearity looks very good, with only 0.5dB  
...bit, the A-weighted S/N ratio was fine at  
...88dB CCIR ARM with a 1kHz reference  
...reference standard). The '701 does not phase  
...above the audible range were typically better  
...ough some breakthrough at around 60kHz was  
...3; perhaps this should be dealt with. (See fig.3  
...th for spuriae, and note the 1kHz marker  
...dB. Scale 10dB/major vertical div, 10kHz/

...squarewave response (fig.4) was typical in view of the  
...I gave no cause for concern. Sensitivity was not

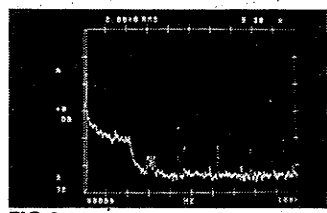
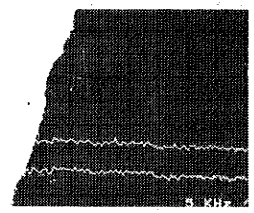


FIG.3

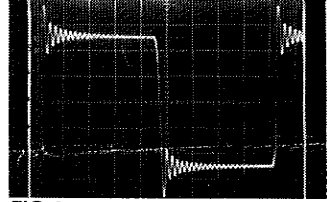


FIG.4

14/16 bit low level (-100dB) discrimination (16 above, below).  
Fig.3: Digital spuriae, 100kHz bandwidth, 1kHz marker at -100dB.  
Fig.4: 500Hz squarewave response (-6dB level).

...particularly high at 370mV for full level, and output was 6dB higher than line reference at 1.4V. Line attenuators may therefore be required on replay with some of the more sensitive amplifiers. It offered a low output impedance, and will drive long cables.

**Conclusion**

In my view Sony have marginally improved upon the well accepted performance standard of the PCM-F1. In fact, for domestic use the

doesn't make excuses, though, when the mastering has robbed the tapes of deep bass altogether - it tells the truth in no uncertain terms.

But bass is only a part of music-making, and far from the central part at that. The M10 is extraordinarily detailed - as clear as best optical glass - and it responds with a willingness and vitality to recorded dynamic shadings that may well cause offence to neighbours. If there's something wrong with the way a record, CD, tape or radio broadcast was produced, you'll know all about it: the M10s are transparent and to no uncertain extent. But this spotlighting of the source works to the user's ultimate benefit. Most loudspeakers sound undercharacterised after the M10, if not downright anaemic.

The list of abilities extends to the stereo image the speakers create, though not perhaps to the degree I had anticipated. The sound-stage was, in fact, well defined in both width and depth, but I suspect that a larger space may have been needed to allow the image to 'gel' and focus wholly convincingly.

The only real criticism of the M10 that remains is of the tweeter. Meridian have, I think, made the best of what they had, but there is no doubt in my mind that the top-end sounds a little raw, and that it lacks perceived extension - 'sparkle' if you like. I was also unhappy about the fact that the speakers have such an obvious 'sweet spot' on-axis with the tweeter. Treble apart, though, the M10 produces a more or less homogeneous soundfield over a large listening area.

**Conclusion**

The M10 is not the kind of speaker that can be recommended unequivocally for all circumstances. It rightly belongs in a largish

'701es is a more logical proposition, and offers a 25% cost saving as well. It becomes the reference amateur and semi-professional PCM recording encoder, and survives comparison in solid state terms with some of the best hi-fi electronics currently in production. That it can do this as well as store audio on low cost tape via an ordinary VCR is a remarkable achievement.

Until digital compact cassette units are properly developed, the PCM-F1 and '701es will rule the roost in this narrow field, except where tape splice editing is essential, and for this a good open-reel deck is still required.

PCM recordings made with this encoder continue to illustrate just how poor the subjective quality of commercial digital recording currently really is. [I quite agree - see 'CD Monitor' on p.91 - Ed.]

**Sony PCM701es**

Frequency response @ -10dB (see graph)		15Hz - 19kHz, 0.15dB -3dB @ 1.3Hz & 20.8kHz -90dB @ 24kHz						
Total Harmonic Distortion @ 0dB dB down		14-bit	16-bit	2nd	3rd	4th	5th	etc
@ -80dB dB down		14-bit	16-bit	-20	-16	-20	-25	<-30
see spectrogram for low-level distortion								
Two-tone intermod 19/20kHz (16-bit)		@ 0dB, peak level	@ -15dB	@ -20dB	-60dB	-70dB	-75dB	(1kHz diff spuriae better than -75dB)
Linearity (by narrow band spectrum analysis)		input	output	0 - 20	-40	-60	-80	-90dB
Signal/noise		14-bit	16-bit	-92dB unwt'd	-94dB unwt'd	-80dB CCIR wtd	-88dB CCIR wtd	
NB: the CCIR readings are ARM for a 1kHz ref. For IHF A-wtd reading add approx 6dB. Eg. 16-bit A-wtd noise is -94dB. Note also that the rec/mute monitor has 8-10dB worse S/N.								
Phase		In contrast to the PCM-F1 the 701 is non-inverting						
Crosstalk		<-77dB, 20Hz:20kHz						
Spurious responses dB for 20kHz, 0dB metered		4kHz	8kHz	16kHz	24kHz			
for 18kHz, 0dB metered		-65	-70	-	-37			
for 16kHz, 0dB metered		-75	-	-	-			
for 14kHz, 0dB metered		-	-	-77	-			
for 12kHz, 0dB metered		(above audible range)						
Digital breakthrough (see spectrogram)		Some ripple @ 60MHz around -50 to -60dB Up to 100kHz, spuriae <-115dB						
Squarewave		Photo shows response @ -6dB rel level, 500Hz quite typical for the system						
Sensitivity		370mV for 0dB						
Output		1.4V (100 ohm output impedance unaffected down to 1k loading)						

room that allows it space to breathe, and needs to be used on the end of a genuinely first-class system. Its advantages are otherwise likely to rebound on system performance. I am reminded of the saying 'the wider the window . . .'. In any case, the M10 should only be considered on the basis of a thorough home demonstration with the final system components in place. The same manufacturer's modular preamp represents, in my opinion, the minimum desirable standard. All this aside, I see the M10 as potentially one of the most able loudspeaker packages available, if not the end of the road for this line of technology.

**Meridian M10**

Measured with 101B preamplifier	
Sensitivity:	estimated at 103dB SPL @ 1m, for 100mV into Aux socket
Maximum output	(for visible distortion seen on microphone output) 50Hz 1kHz 10kHz 98dBA 103dBA 98dBA
(measured semi-anechoically, 2m above ground, mic 1m higher again on tweeter axis; tone-burst signal 1/2s on, 1/2s off)	
Harmonic distortion	92dBA 98dBA 101dBA 103dBA 106dBA
40Hz	1.3% 1.2% 1.5% 2.0% 4.3%
1kHz	0.6% 0.7% 1.0% - -