



8 15" ACTIVE MOULDED SPEAKERS

In the torture test
On the test bed
And "as heard"

This type of speaker is enjoying a certain degree of success in the much coveted market for mobile sound systems. Moreover, some prestigious brands in the professional sector have recognized the opportunities and now are also proposing innovative, affordable products for this particular segment, with ever increasing performance.

It must be admitted that the format offered has a lot of attractive selling points, beginning with the spectacular reduction in weight and ergonomic features that are often well thought out. With the box in plastic, Class D amplification and neodymium magnets, the technological solutions used in the majority of the models tested mean that they seem as light as a feather and can be handled even by one person. Setting them up on the tripod can be achieved solo, without too much hassle, in one quick operation.

Another justification for their success is their level of performance. The power of the integrated amplifiers is constantly on the increase, opening the way to larger and larger audiences. These days there are many models which flirtatiously approach or even surpass 130dB SPL.

Finally, if you add the fact that the 15" speaker they contain is considered to go low enough to dispense with the additional subwoofer in many applications, it is easy to understand that this type of product is quite attractive for any sound specialist for disco evenings and conferences, who is looking to transport all his equipment, for both sound production and control, in a single minivan.

So, are these models really the all-singing, all-dancing solution for sound engineering, capable of solving all sound reproduction problems? It's not quite that easy! Even if DSP processing can, under certain conditions, permit the optimization of both the dynamics and the time and frequency responses in the most up-to-date systems, it's still a fact that the laws of electro-acoustics remain constant. The co-ordination of the directionality of a large 15" speaker with direct projection together with a tweeter unit working through a horn

with constant directionality at short-range is a challenge that is difficult to meet satisfactorily.

Finally, what did we think about the sound quality delivered by these speakers, which of course depends very much on the transducers used, and their dimensions, but also on the plastic materials employed in the manufacture of the boxes? For the 8 candidates tested, we set 4 preconditions. The first 3 are implicit in the title of our dossier: "moulded enclosure", "active", and fitted with a "15" speaker". With regard to the 4th criterion, we wanted to eliminate the models that were simply too cheap and which, in our view, do not provide adequate performance.

So the prices of our competitors start at a little over 600 euros and finish up at around 1800 euros. There's nothing miraculous about this: for 600 euros you cannot get the quality or performance of a professional speaker worth 3 times the price.

However, between these two extremes, our tests show that pop rock groups and dance hall DJs will nevertheless hit on several models capable of delivering sound to a vast auditorium with results that are more than satisfactory, offering all the advantages stated above.

DAS DR-115A



01 /the DAS 15M14 15 speaker using tried and tested technology.

OUR OPINION

WE LIKE:
THE CAREFUL MANUFACTURE

WE'RE NOT KEEN ON:
IN-ADEQUATE PERFORMANCE
OLD TECHNOLOGY
HIGH WEIGHT

INFO/ DISTRIBUTOR:

DISTRIBUTOR: AXENTE

GUARANTEE PERIOD:

SPEAKER BOX 5 YEARS/ELECTRONICS 2 YEARS

DEVELOPED IN: SPAIN

ASSEMBLED IN: SPAIN

AVERAGE PRICE INCLUDING TAXES:

897 €

DAS is a very active producer with factories in Valence and Barcelona and enters the ring with the DR115A, a speaker at the top of their range, which is already quite old but judiciously restyled a little less than 4 years ago.



2



3

**02 /Mineral wool behind the M34 compression driver
03 /Tweeter with, from left to right, rear casing, titanium diaphragm and phase plug at the heart of the ferrite magnetic unit.**

Only 4 years! We may as well be talking light years when we look at the aesthetic and technological developments demonstrated by the competition. Our comparison provides an opportunity to check whether this speaker still retains the selling points that attract customers in 2011, or if the Spanish manufacturer should consider a new facelift, or an even more radical recasting.

DESIGN

Curves in every direction – the grey anthracite shell has no rough points, either to the eye or to the touch. This exclusive design from the beginning of the 2000s has no room for straight line sections. No flat sides, even on the side face it rests on when it's used as a stage monitor. For this application there are 4 raised bumps that serve as sliders and are sufficient for ensuring it sits firmly at an angle of 40° to the ground. With regard to the general appearance of the shell, even if the design to some extent reveals its age, the moulding is well executed and the plastic material is of good quality. With respect to the ergonomic fittings for setting it up, the speaker is provided with M8 inserts allowing it either to be suspended or even fixed to a wall using an optional attachment plate. Of course, traditional installation on a pedestal has not been forgotten and, as is to be expected, the shell is fitted at the base with the inevitable 36mm recess, with tightening screw. However, be careful when you try this! Because it only has a single side handle and, with the considerable weight, setting up this speaker on a tripod may prove perilous as a solo operation.

THE TRANSDUCERS

The 15" loudspeaker made by DAS, and solidly fixed onto the front face with 8 Phillips screws into metal-inserts, is of simple, classical manufacture. Fitted

with a 6-spoke stamped metal basket, an impressive ferrite magnet with central ventilation well, a paper diaphragm with half-roll suspension in coated paper, this loudspeaker is equipped with a 3-inch coil with a nominal impedance of 4Ω yielding 350W RMS. The bass reflex loading uses two vents hidden behind the grille and situated on either side of the woofer, in the lower part of the shell. To try to reduce parasitic resonances, the internal walls have been designed with a network of transverse stiffeners and have been lined in the upper section with thick, dense mineral wool. The upper end of the sound spectrum is consigned to an in-house driver with a 1.34" titanium diaphragm. The throat of the driver is screwed to a constant directivity horn integrated in the moulding of the front half-shell. The nominal dispersion of the horn is 90° x 45°.

PROCESSING AND AMPLIFICATION

The control panel and connector panel contain all the basic functions to enable versatile and independent use of the speaker. This means that on the combo base the user has an XLR female/jack 6.35 on the input side with an XLR male pickup plug, an entry level micro/line switch, a switchable low frequency cut-off filter at 100Hz and the inevitable volume control. LEDs show the presence of the signal, overloads for each of the bands and one of them showing on the front of the box indicates the power supply. It is simple but adequate for the product's market position. With regard to the electronics, hi-tech enthusiasts will not find it easy to indulge their addiction. Analogue processing is limited to a single distribution filter, for which DAS supplies no details – see "Measurements" below. With regard to amplification, the designers have used a mixed technology with a classic 100W Class AB amplification for high frequencies and, for

PRODUCT SELECTION DOSSIER / 8 SPEAKERS

the low frequencies, the popular OEM Ice Power Class D unit from Bang and Olufsen, delivering 300W at 4Ω. With this equipment, the speaker is rated to deliver 130dB SPL at peak.

MEASUREMENTS

Amplitude-frequency response

In the speaker axis, the bandwidth is extensive, but the amplitude response lacks linearity. Admittedly, the low frequencies can easily be exploited up to 50Hz, but around 400Hz the medium-low frequencies take on too marked a character. With regard to medium-high frequencies, they dominate across a fairly broad band culminating in +6dB for 10KHz. Beyond that, the high frequencies fall away. The use of parametric filters would certainly enable some of these irregularities to be ironed out.

Phase-frequency response

The phase response is exemplary, and among the flattest I have ever been able to measure for this type of speaker. The time lag between drivers is very low, indicating good alignment. The curve shows that the distribution filter employs low gradients, probably only of the first order, since from 1.5 to 6KHz, more or less the crossover band width, the phase rotation is only 90°. This low gradient filter option facilitates a wider overlap between bands,

which under certain conditions greatly favours the linearity of the response within the axis.

Directivity

Readings for the response variations outside the axis in the horizontal plane show that directivity is not under control, both in the medium and the high frequency ranges, since the 6dB attenuation which determines the semi-aperture angle is reached in both registers from the 30° position. In the positive vertical plane (towards the horn) the hyper-directivity of the 15" speaker from 500Hz, together with the low gradients of the distribution filter, give rise to very considerable attenuation in the critical medium frequency area. The crossover frequency, probably around 3 KHz, is too high and does not permit a satisfactory link. In the negative vertical plane from 0 to -20°, the measured variations are acceptable and show an appropriate degree of control for the horn from 3 to 20 KHz, i.e. over the whole of its reproduction range.

LISTENING TEST

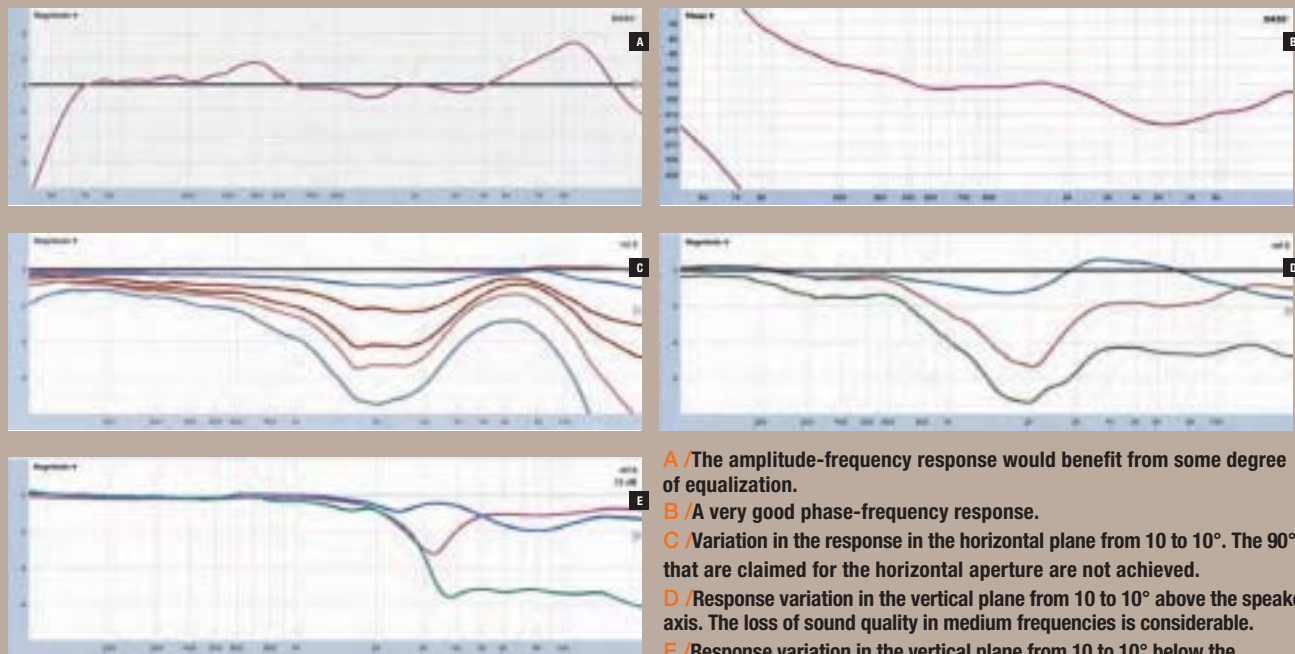
The actual performance results from the DAS are rather strange, so that we might ask whether such a physiologically important selection represents the company signature or follows from customer demand. The lower register is very round, with the

emphasis between 150 and 500, which, as the English trade expression has it, makes it quite "boomy". The middle and upper middle frequencies are present but are rather washed out, and really without much personality, but above all they are eaten away and masked by high frequencies that are simply too much. This "super-loudness" reproduction gives some tones that are rather faded and only consist of high-pitched sounds and a veiled sound.

You have the impression that everything was recorded by finely chiselled electret microphones! This response might be partially corrected by an equalizer, but in view of the selling price of these boxes, the total bill would end up being on the high side. As is often the case, the aperture is wide, but far from achieving the 90° claimed by all manufacturers, and the loss of sound quality can be perceived from +20°.

When listened to at nominal output and above, the DAS DR115A behaves well from a point of view of reliability, but not so well from a musical perspective. The choice of the settings by the engineers makes use of relaxation constants that are too quick, which chop the sound up, generating ugly "sound pumping".

MEASUREMENTS AND TESTS



- A /**The amplitude-frequency response would benefit from some degree of equalization.
- B /**A very good phase-frequency response.
- C /**Variation in the response in the horizontal plane from 10 to 10°. The 90° that are claimed for the horizontal aperture are not achieved.
- D /**Response variation in the vertical plane from 10 to 10° above the speaker axis. The loss of sound quality in medium frequencies is considerable.
- E /**Response variation in the vertical plane from 10 to 10° below the speaker axis.

dB TECHNOLOGIES

OPERA 605D



01 / The half shell with the drivers and its complex network of ribs

dB Technologies, an Italian company, is the trademark of AEB Industriale, the acronym for “Acoustic Engineering Bureau” in Bologna. After incorporation into the RCF consortium in 2005, it has succeeded in adapting the group’s industrial resources for its own designs, but without having to renounce its own original personality.



02 / Phase plug in plastic and the HF diaphragm.
03 / Electronics bearing the Digipro signature.



The Opera range of moulded speakers is a fine illustration of the “good vibes” at the heart of this industrial partnership. All the electro-acoustic solutions for the sound diffusers are the brainchild of AEB Industriale, whilst the DSP [Digital Signal Processing] and the amplification come from Digipro™, the electronics subsidiary of the group which, incidentally, also supplies the speakers for the ART series from RCF.

DESIGN

The aesthetic concept of the Opera 605D plays on contrasts: discreet and well-behaved in its sombre outer garb, audacious through its lines. Rounded shapes predominate in the lower section, the sides curve out to marry up more closely with the circumference of the 15” cone. In a perfect contrast of styles, the upper part integrates the triangular vents and the unusual asymmetrical horn into its tense, straight lines.

The anthracite-coloured dress of the 605D is produced from injection-moulded high-density polypropylene. Its high quality finish has a slightly granular appearance. The metallic grille protecting the boomer is 1.5mm thick and is covered on the reverse side with acoustic foam. For transporting and handling this speaker unit, the top and side faces of the diffuser are fitted with ergonomic, rubber-coated handles.

The base includes 4 non-slip pads and a standard fitting for a pedestal. The 605D, which can also be used as a stage monitor, has symmetrical sides angled at 43°. The interior of the shell has been designed with the aim of suppressing, in as far as possible, the resonances inherent in plastic cabinet work.

When we look at the pentagonal, rear half-shell, we see that it is provided across the middle with a sturdy transverse stiffening bar.

And, finally, its walls are covered with polyester wool.

THE TRANSDUCERS

The 15” loudspeaker carrying the AEB signature is a nice piece of work. Designed around a cast aluminium basket and a neodymium magnet, this boomer is extremely light. The magnetic circuit is compact and has 6 ventilation wells to remove the calories generated by the 3” coil. This delivers a constant output of 400W at a nominal impedance of 4Ω. The conical membrane which it drives is in corrugated paper with an accordion-type suspension. The bass-reflex loading is mainly achieved by the two large triangular vents situated on either side of the horn. Their form was especially researched so as to give a 50% reduction in air-generated noise.

dB Technologies has selected a compression driver with a 1” diameter throat, fed by a 1.4” neodymium magnet tweeter. The impedance coil of nominally 8Ω can work at 200W in continuous operation. The dome diaphragm is composed of a light, rigid mylar film. It communicates with the throat of the horn via an annular polypropylene phase plug installed right at the heart of the magnetic unit. Once loaded up by its wave guide, this little driver is capable of delivering a peak of 131dB SPL at full power. When the speaker unit is positioned on a tripod, the horizontal aperture of the horn varies between 65° at a distance and 80° up close. For sound diffusion direct towards the audience, the choice of this asymmetric horn proves to be an excellent solution with respect to dispersion control, since it optimizes the propagation of energy in accordance with the traditional distribution in the auditorium.

PROCESSING AND AMPLIFICATION

The connection panel is provided with more than adequate connection facilities, including one XLR female input, which is switchable between mike and line sensitivity, and 2 outputs parallel with the input which are available optionally on a base with an XLR male or TRS jack. On the DSP processing side, a

OUR OPINION

WE LIKE:

The asymmetrical directivity
The weight, so light
The price/performance ratio

WE'RE NOT KEEN ON:

The very low frequencies, rather restricted
Impossible to pivot the horn
In an onstage monitor situation

INFOS / DISTRIBUTOR

DISTRIBUTOR: Audiopole

GUARANTEE PERIOD: 2 years

Developed in: Italy

Assembled in: Italy

Average price including taxes:
819 Euros

PRODUCT SELECTION DOSSIER / 8 SPEAKERS

switch permits the inclusion of a physiological "loudness" filter. Finally, 3 indicator lights show respectively the presence of the signal, the operation of the limiter and the power supply: this last indicator is also doubled up on the speaker front using a very "designer" blue indicator lamp.

The Class D amplification has a feed with power factor correction. It develops respectively 200W RMS for the high frequency section and 400 for the low frequencies. The cooling system is silent, using natural convection. DSP processing employs 24-bit quantification at 48 kHz, and manages the filtering, equalization and the different protection circuits for the speaker unit. With regard to the distribution filter, the crossover frequency has been set at 1670Hz with 4th order gradients.

MEASUREMENTS

Amplitude-frequency response

In spite of belonging to the RCF group, dB Technologies uses its own electro-acoustic solutions in designing its sound diffusion systems. For a competent development engineer, it is fairly tempting and relatively easy to clone the response for an already successful speaker unit, although

this assumes that DSP resources allow it. The Digipro engineers have therefore provided the Opera 605D with the amplitude-frequency response of the ART-725. With this processing, the band width at + 3dB is 80Hz-20 kHz.

Phase frequency response

The phase response shows no abnormal features. The 360° rotation noted in the crossover band is natural and can be easily explained by the use of 4TH order filtration. The absence of incident in this part of the spectrum shows the good temporal alignment of the transducers. In the low frequencies, the phase delay is connected with the high-pass filter which protects the boomer below its cut-off frequency.

Directivity

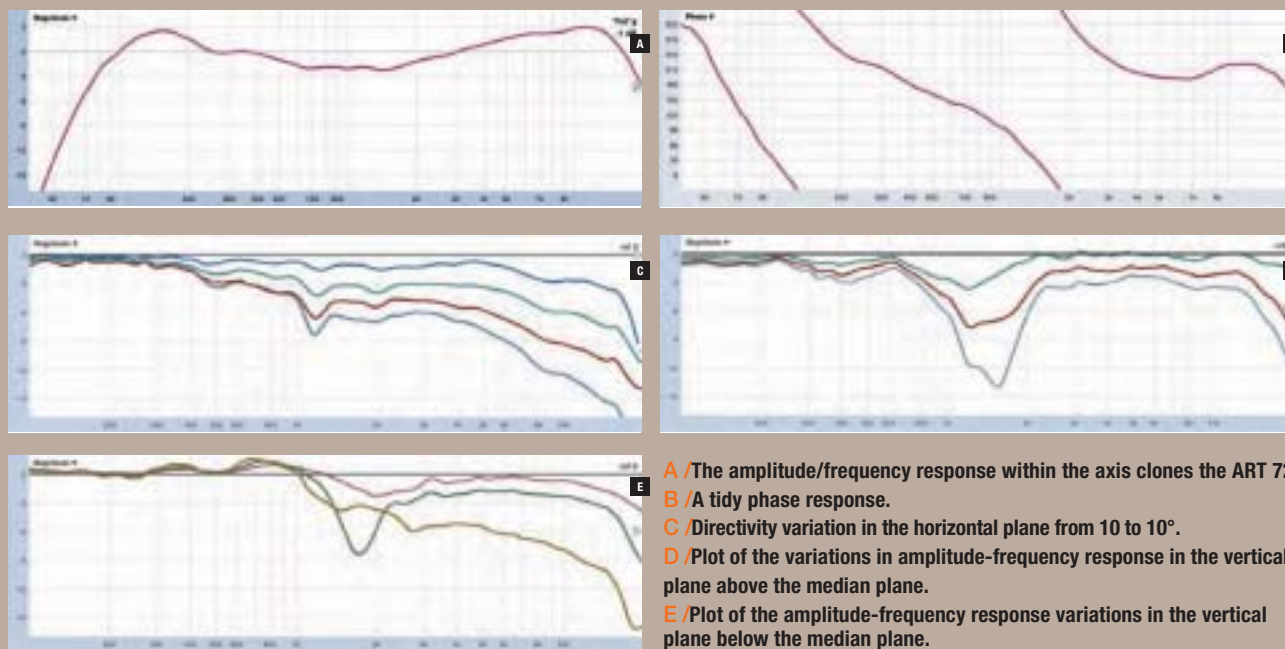
The plot of the response variations in the horizontal plane shows a directivity that is under control in the whole reproduction band of the horn. The attenuation above 8 kHz is natural and proportional to the listening angle. The performance curves do not present any significant anomalies, except for a slight pinching which is limited to a very narrow band, around 1.2 kHz. For the lower end of its reproduction range, the asymmetrical wave guide maintains a remarkable performance. With regard to vertical directivity, the pinching in the medium

frequency range is the direct result, on the one hand, of the hyper-directivity of the 15" speaker and, on the other, of the interference behaviour connected with the difference in the acoustic trajectories outside the axis between the two drivers. This kind of behaviour becomes a problem during use as an onstage monitor.

LISTENING TEST

Like the RCF tested in this report, the Opera 605A is from Italy and is similar in terms of performance, although it costs around 30% less, a compelling sales point. The low frequencies are well reproduced, with an attractive extension towards the bass, good vivacity and a dry colouring. The only criticism would be a slight lack of medium-bass and absence of colour or even warmth. The medium and high frequencies are very well reproduced and, in addition, dispersion is well managed with a closely controlled level which ties in well with the 15" speaker. Once again, one would prefer a bit more personality to take it beyond a clinical and slightly sad reproduction. When heard at nominal power, the Opera 605A provides value for money, although if you then continue to push up the input signal, the way in which the built-in limiter cuts in reveals a control system that plays for safety rather than musicality, which spoils the fun, and means that you have to keep an eye on the VU meters.

MEASUREMENTS & TESTS



- A / The amplitude/frequency response within the axis clones the ART 725.
- B / A tidy phase response.
- C / Directivity variation in the horizontal plane from 10 to 10°.
- D / Plot of the variations in amplitude-frequency response in the vertical plane above the median plane.
- E / Plot of the amplitude-frequency response variations in the vertical plane below the median plane.

ELECTRO-VOICE ZXA5.



01 /The DVX 3050 boomer, whose ordinary-looking exterior conceals a very sophisticated speaker.

OUR OPINION

WE LIKE:

The exceptional power
Enormous dynamics
The professional manufacture
The quality of the cabinet construction and the drivers

WE'RE NOT KEEN ON:

High weight
The off-putting price

INFO / DISTRIBUTOR

Distributor: EVI France

Guarantee period: 3 years

Developed in: USA

Assembled in: Germany

Average price including taxes:
1930 Euro

Electro-Voice has been one of the pioneers of moulded speaker units because, as early as 1982, this legendary American company successfully launched its affordable S-series. 30 years later the SX100 and SX200, just as popular as ever, are now experiencing competition among aficionados of the brand in the form of the ZX series, from which we are testing the flagship product, the ZXA5.



02 /Anatomy of a compression driver from EV, showing from left to right: the casing/radiator supporting the pole pieces and the neodymium magnet, the dome diaphragm and the moving coil mounted on the conical phasing plug, with a 1" throat and threaded attachment section to the horn.



03 /The electronics of the ZXA5. Please note: the iPhone is not supplied with the amplifier!

We should say at the outset that this juiced-up speaker unit is unfortunately much more expensive, which means that Electro-Voice is aiming more at the professional sound engineering market than the market for local events or music performances.

DESIGN

The ZXA5 has class, an example of industrial aesthetics which has succeeded in a world where good taste and discretion are not the most widely encountered of virtues. Here, the front face of exemplary sobriety is totally occupied by a sturdy perforated grille in lacquered galvanized steel. This, with its concave form, is endowed at its mid-section with a discreet curve giving the trompe-l'oeil illusion of the waistline of a top model. The reverse side of the grille is covered in an opaque hydrophobic textile, which is acoustically transparent. The enclosure, in deep black, is manufactured from an excellent quality polymer. This hard and durable composite is entirely smooth in appearance, with not the least sign of roughness. The rear half-shell takes on an unusual asymmetrical profile, with one of its faces carefully angled for use as an inclined support. In this particular position, the projection angle of the diffuser can go from 45 to 55°, thanks to two removable extensions intelligently integrated into the base.

The ZXA5 only has a single carrying handle. This is not enough to enable one person safely to position the 23 kg heavy speaker unit on a tripod. With that in mind, Electro-Voice has of course provided the base of its diffuser with a 36mm housing with an azimuth setting screw. The enclosure is also provided with a number of lifting accessories, including 5 rapid

attachment plates and 8 M10 threaded inserts which are uniformly distributed over all the faces of the box. The interior is lined with thick, dense mineral wool.

TRANSDUCERS

The extended range boomer of the ZXA5 was designed using a simulation programme to provide finite element analysis of its dynamic performance. Using this technology, the structure of the motor and suspension were optimized to obtain an improved linearity in the displacement of the moving coil. The DVX3050 low frequency speaker, which was conceptualized in this manner, offers unrivalled performance, particularly through increased sound pressure and an appreciable reduction in distortion. The boomer is constructed around a forged steel frame which at its centre carries a generously proportioned magnetic circuit in ceramics (ferrite). The centre is pierced by a single ventilation well which provides forced cooling generated by the conical membrane in corrugated paper. This speaker with its nominal impedance of 8Ω will take 500W in continuous operation. The bass reflex loading is achieved by two triangular vents opening discreetly behind the protective grille at the base of the enclosure. The ND2 driver which deals with the high end of the spectrum has a 2" diameter titanium dome diaphragm. It is linked to the throat by means of a conical phasing plug. The high precision with which the latter has been machined enables extension of the band width right to the upper limit of the audio spectrum. The compression ratio is 4/1. The magnetic component is of neodymium and is built in as part of the tweeter case, which also functions as a radiator.

PRODUCT SELECTION DOSSIER / 8 SPEAKERS

This 8Ω motor is capable of delivering a peak of 132db SPL at full power. Loaded by the constant directivity horn with an aperture of 90° x 60°, it delivers consistent energy to an audience positioned within the dispersion angles.

PROCESSING AND AMPLIFICATION

Carefully mounted at the rear of the enclosure, the control and connection panel has a very professional appearance. In particular, the main section has a sturdy switch with an indicator and, above all, two Neutrik Powercon lockable connectors. With regard to the audio section, this is extremely simple and consists of a combo input connector, an XLR female output signal connector, a volume control and a micro switch for operating a high pass filter. The latter cuts off at 100 Hz, with a gradient of 24dB/octave and is intended for use with a supplementary subwoofer. The Class D amplification generates respectively 1000W for the LF and 250 for the HF. The cooling is by forced air ventilation. With regard to processing, the distribution filters use a classic Linkwitz-Riley 4th order filter with gradient crossover at 1500 Hz. For the safety of the transducers, the electronics on each of the amplification branches have a peak detection limiter and a thermal protection circuit.

MEASUREMENTS

Amplitude-frequency response

The amplitude-frequency curve measured near the speaker and within the enclosure axis is contained within a + 3dB range between 60 Hz and 16 kHz. The trace is relatively flat except at 12 kHz, where the presence of a slight bump could give the sound quite a brilliant character.

Phase frequency response

The phase response offers no surprises, with a response that is traditional, bearing in mind the type of filters used. At the crossover frequency the curve shows an inflected point, which would make one think that the high frequencies are delayed with respect to the low frequencies at the location of our measurement microphone.

Directivity

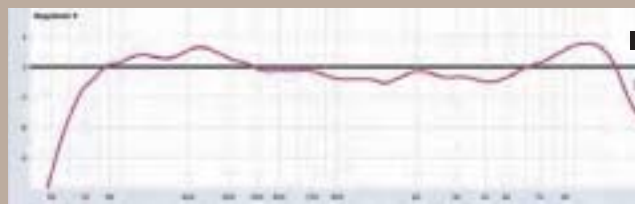
In the horizontal plane, directivity results are good up to 30° outside the axis. Beyond that, the curve in the medium and extremely high frequencies falls outside the permitted 0/-6dB range. In the vertical plane, the horn gives perfect control of directivity over its whole operating range. On the other hand, the medium frequencies are rapidly squeezed from 20° above the median axis of the enclosure. Lower down, which is frequently the case for normal reproduction for an audience, the directivity performance is altogether acceptable, with a natural attenuation of the high frequencies and a restrained amount of tone loss in the medium range.

LISTENING TEST

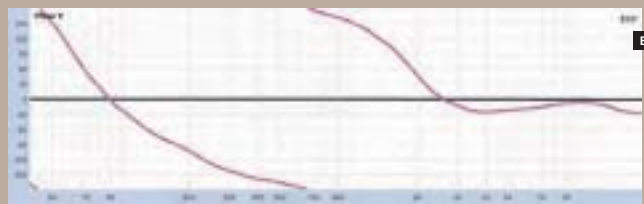
The ZXA5 is a seriously big brute, and gets down to work with masses of power, with thoroughbred loudspeakers and an output designed to carry long and loud. The low speaker hits like a 12", has the low register of a 15" and seems incapable of being caught out. The lower mid and the mid ranges suffer a little from the liveliness of the transducer used which, in its turn, seems disgustingly healthy. While sturdy at the two ends, it leaves a kind of hole in the centre, not necessarily in terms of the level, but mainly in terms of the density and presence of the sound, which makes itself heard in simple piano/voice pieces. The high frequencies "rattle the woodwork", probably a bit too much, and might need some adjustment when used at a range close to the public, even if the excess weight is in terms of colour and density.

Dispersion shows a good medium performance, without noticeable accidents. When listened to at high volume, the ZXA5 leaves the competition way behind, with an effective performance capable of reaching a large number of people. The volume seems to climb forever, without the limiter cutting in. A very fine product, which is certainly horribly expensive, needing more work on its acoustics and requiring a competent operator to get the best out of it, but still remaining very attractive in its professionalism.

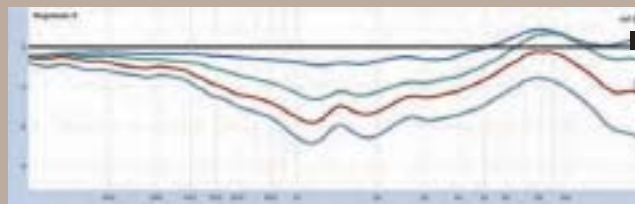
MEASURES AND TESTS



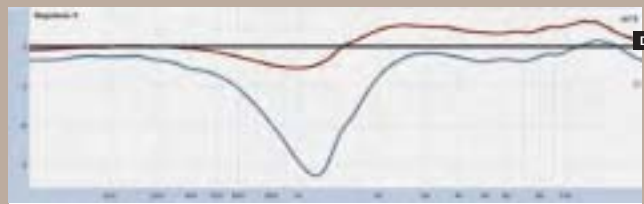
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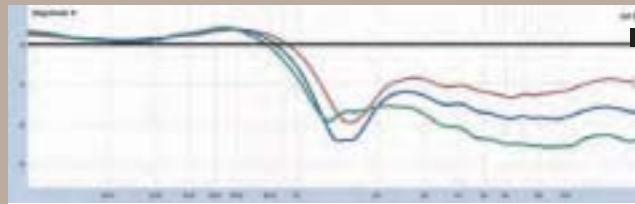
B



C



D



E

- A / Extended band width.
- B / Trace of the phase frequency response in the speaker median axis.
- C / Response variation in the horizontal plane from 10 to 10°.
- D / Response variation in the vertical plane above the median plane.
- E / Response variation in the median plane below the median plane.

FBT PROMAXX 14A



01 /The woofer, a transalpine industrial partnership between B&C and FBT.

OUR OPINION

WE LIKE:

The sound
The performance
The technology

WE'RE NOT KEEN ON:

No regrets?

INFO / DISTRIBUTOR

Distributor: Major Audio

Guarantee period: 1 year

Developed in: Italy

Assembled in: Italy

Average price including tax:
1160 Euros

FBT, as a well-known manufacturer of sound reproduction equipment, will soon celebrate half a century of existence. This fast-growing company, established in the heart of Italy, has brought out from its ultra-modern production lines speaker units aimed both at the professional market and at well-heeled DJs and musicians.



02 /The casing and the diaphragm of the DE620 compression driver from B&C.



03 /From left to right: the switched mode power supply, the class D amplifiers and the DSP circuit.

The FBT ProMaxX 14A presented here is a multipurpose speaker system. Full of highly distilled technology, its DSP has 8 factory-programmed configuration memories which enable it to adapt instantaneously to the operating mode and the acoustic characteristics of the venue.

DESIGN

At first sight, the ProMaxX seems to start with a serious handicap, mainly in terms of size, since its exclusive but "small" 32cm (14") woofer would not allow it to take part in this comparative study devoted to 15" loudspeakers. The editorial staff at Sono Mag are not known for granting favours, but one has to admit that, if it had not been upgraded and not lacked competitors in its own size range, this speaker could not have been entered into the competition. In fact, by allowing it to get into the ring with the "heavyweights", our editors have applied a sort of positive discrimination. However, this shouldn't disadvantage any of the regular candidates in this dossier, since the reduced size of the woofer is more likely to penalize the band width performance of the outsider.

But it is not only the unusual size of its speaker which separates this FBT unit from the rest. Its bi-radial horn profile with the curved flank is a surprising shape, which gives the speaker a very unusual, avant-garde look; and that is in spite of the rather humdrum greyish colour of the injection-moulded polypropylene shell.

With regard to the ergonomics, this speaker unit has been well designed, having on the one hand the absolutely essential housing for the standard pedestal, but also M10 anchoring points for suspending it on an optional fixing bracket. The asymmetrical rear half-shell has monitor tapers which

enable it to be used on stage at angles of 12, 40 or 55°. The shell is of suitable thickness, and its internal walls are provided with transverse stiffeners integrated into the moulding.

THE TRANSDUCERS

The woofer is built around a 6-spoke basket in pressed metal, holding the neodymium magnet at its heart. Supplied OEM by B&C, the yoke is pierced around its periphery by ventilation wells for removing the energy generated by the 3" (75mm) diameter coil, with a nominal impedance of 4Ω. The 320mm conical membrane in rigid paper pulp is entirely smooth. Its accordion-type circumferential suspension is made of coated fabric. The bass-reflex acoustic loading makes use of 4 large-sized laminar vents opening longitudinally and transversally at the 4 corners of the diffuser. The high frequencies are handled by a 1.4" B&C compression drive of the latest generation, fitted with a titanium dome diaphragm. The neodymium magnet unit is mounted on a copper capsule which, according to the manufacturer, improves its behaviour at high frequencies. The 2.5" (65mm) aluminium wire coil with a nominal impedance of 8Ω will take 160W in continuous operation. The performance figures stated for this tweeter are impressive, since its sensitivity of 107dB means that it can deliver 135dB peak at full power with a pre-filtration band width covering the whole register from 1 kHz-18kHz. Once it is coupled to the horn, this generous driver is capable of generating consistent energy for an auditorium spread out over a 90° horizontal aperture and with a 60° vertical aperture.

PROCESSING AND AMPLIFICATION

At the back of the enclosure, the connection and control panel gathers together the input/output

connections on the XLR base, along with various controls, in particular for setting the volume, audio earth leakage circuit breaker the incorporation of a bass cut-out filter and, which is less usual for this type of speaker unit, selection of configuration memories for the DSP. The indicator lamps have not been forgotten, and there are 3 LEDs to show on/off, the presence of the audio signal and the commencement of operation of the limiter or of the unit's protection system. The Class D amplification is very carefully designed and generates respectively 600W for the low frequencies and 300 for the high frequencies. The crossover frequency for the distribution filter has been fixed at 1300 Hz by the designers. The gradient of the filter curve is not stated in the documentation supplied.

MEASUREMENTS

Amplitude frequency response

Within the axis, the amplitude response was measured using the first preset, entitled "original", which in the French information sheet is described as "corresponding to the typical sound of FBT speakers". The curve does not reveal any irregularity, but offers a kind of physiological compensation, slightly favouring the two ends of the audio spectrum.

Within a range of 60 Hz – 20 kHz the amplitude

response stays within a bracket of + 3dB. This is very good.

Phase frequency response

The phase response is perfect, with a flat curve across the whole of the reproduction range of the horn. What arouses my curiosity is the very linear curve which only commences beyond the overlap frequency. In its documentation, FBT has not given anything away about the filtering technology used, but you can bet that the proprietary algorithms used are based on finite impulse response filters.

Directivity

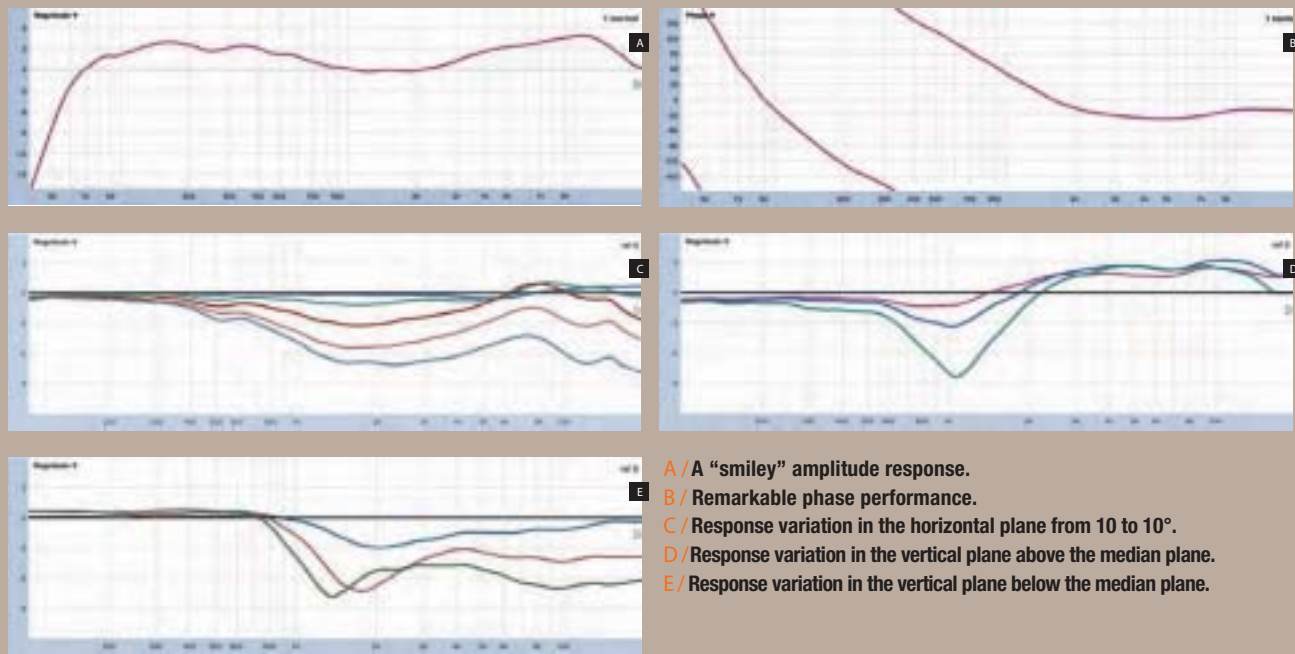
The trace of the response variations in the horizontal plane shows directivity performance which keeps within the aperture characteristics advertised. This is so rare in this comparison that we should underline the fact. The choice of the 14" speaker and the crossover frequency used are certainly not without significance for this excellent performance level. In the vertical plane, the graph for the variations also shows good directivity control. Maybe one should just note that at 30° above the median axis, the response at the crossover frequency falls very slightly outside the bracket authorized by the manufacturer's characteristics. This directivity behaviour is inevitable, due to the interferences inherent in the differences in the acoustic trajectories between the drivers.

LISTENING TEST

The ProMaxX 14A, which is pretty compact and provided with a 14" speaker in place of the 15" units fitted to the other speakers in this survey, turns out to be a very agreeable surprise. Everything breathes, sways and hits us firm and hard, especially when you look at the vital statistics of this nice little "Italian job", fitted out by B&C. The low frequencies have the luxury of competing on equal terms with JBL and EV, round and precise, adventurous towards the bass end, and linking up well with the 2.5" compression driver, it is a model of its kind. Overlap between the bass and high frequencies produces a very good medium range without aggressiveness, and the same applies to the high frequencies which, in spite of a fairly obvious hump in the curve, do not appear to be overdone.

Dispersion is on the good side of average, but of course there's no question of talking about 90°. The built-in DSP not only delivers a number of sound colours but also optimizes output in the lower registers and acts as a sound engineer within the envelope curves, by absorbing the excesses with a certain musicality and, well done FBT!, by keeping some semblance of balance in the spectrum reproduced, and even offering a certain amount of dynamics. The maximum level reached is amazing compared with the modest proportions of the box. A super product and worth its price.

MEASUREMENTS & TESTS



A / A "smiley" amplitude response.
 B / Remarkable phase performance.
 C / Response variation in the horizontal plane from 10 to 10°.
 D / Response variation in the vertical plane above the median plane.
 E / Response variation in the vertical plane below the median plane.

JBL EON 515 XT

JBL deserves, more than ever, its title as the world leader in professional sound reproduction. After selling over a million units from its EON range worldwide, this prestigious Californian brand holds a record which its most ambitious competitors will have difficulty in approaching.



02 / The 2114H tweeter attached to the asymmetrical horn of the 115XT.
03 / The electronics bear the Crown signature, Harman's group policy will accept nothing less.



01 / 265F woofer

To drive home their advantage and perpetuate the EON success story, JBL has no hesitation in continuing to develop its range on a regular basis. Its flagship speaker, the 515, has now been given the suffix "XT", but the most interesting changes are above all that its ergonomics, and chiefly its performance have been considerably improved.

socket for a tripod, complete with stabilizing screw, and 6 M10 inserts for suspending the diffuser horizontally or vertically.

At the rear, 2 wall sections inclined at 40° permit an ideal positioning of the speaker as an onstage monitor.

DESIGN

The JBL designers wanted to give their very latest version of Eon a classic image, at once dark and discreet. The enclosure, in high-pressure injected polypropylene, is an intense and lustrous black. The composite material has a smoothness of finish which simply breathes quality. The front of the box has two profiled vents and an immense metallic grille, which is finely perforated and is lined on the back with an opaque acoustic fabric. Behind this improvised "mashrabiya" screen, it is impossible to catch sight of the horn geometry. Therefore, for aligning the enclosure, the user will have to rely on his ears which, for my part, I regard as an acceptable compromise in such a convincing design. Even the symbol at the base of the grille has had to dispense with the graphic chart in the brand, by abandoning its traditional orange background in favour of the monochrome charcoal of the front face.

THE TRANSDUCERS

The 265F boomer, made in China, demonstrates all the creativity in JBL's R&D department in an embodiment unique to the field. This loudspeaker is constructed around a slender basket in the form of a 1-piece aluminium casting, which also serves as a radiator. The 15" conical membrane in moulded paper is "energized" by 2 differentially-mounted coils (differential drive). These two coils, with very low impedance, have an unusually small diameter of 2 inches. They float in the air gap of a tiny neodymium magnet, at the centre of which is situated the loudspeaker's coupling system. In spite of its modest size, this low frequency driver is well able to cope with the half-kW RMS from the power amplifier without any problems.

The upper end of the sound spectrum is entrusted to the in-house 2414H compression driver with a 1-inch throat. This small transducer, which also has a neodymium magnet, is also fitted to certain speaker units in the higher quality ranges of the brand, such as the VRX and PRX series. The annular polymer diaphragm is 1.4 inches in diameter. The coil has a nominal impedance of 8Ω and can cope with a power of 100 RMS.

The rear half shell, which soberly continues the design from the front, basically puts the priority on ergonomics. The fittings it has available to facilitate transport and installation are very complete. In particular, there are 3 rubber grip handles, a 36mm

OUR OPINION

WE LIKE

The design and the finish, superb!
The high technology transducers
The very practical Integrated mixer

WE DON'T LIKE

The absence of DSP handling

INFO / DISTRIBUTOR

DISTRIBUTOR: SCV Audio

GUARANTEE PERIOD: 2 years

DEVELOPED IN: USA

ASSEMBLED IN: China

AVERAGE PRICE INCLUDING TAX: 930 €

PRODUCT SELECTION DOSSIER / 8 SPEAKERS

can cope with a power of 100 RMS. The output from the compression driver is handled by an asymmetrical horn with nominal apertures at, respectively, 100° in the horizontal plane and 60° in the vertical plane.

PROCESSING AND AMPLIFICATION

The connection and control panel, which is carefully built into the rear side of the enclosure, includes a small intelligent 3-channel mixer console. The first 2 inputs with jack connectors take the line signals, whilst the third using a XLR/jack combination can be adjusted in sensitivity via the mic/line control. This input also possesses a male XLR connector which, if necessary, allows the connection of a second speaker unit in parallel. The overall tonality in the low and high frequencies can be modified to suit the user's taste with 2 Baxandall filters. The Class D amplification develops 525W for the low frequency band and 100W for the high frequencies, respectively. The crossover frequency for the distribution filters has been set at 1 700 Hz. The gradients are of the 4th order. A peak detection limiter placed upstream of the bass amplifier takes care of protection for the woofer. Its operation is indicated by an overload LED.

MEASUREMENTS

Amplitude-frequency response

Within the 70 Hz-20 kHz band, the d=frequency amplification curve operates within a + 3dB range and presents a response which is somewhat characterized by "loudness". If the result is satisfying overall, one might nevertheless express some disappointment that the absence of a DSP resource does not permit linearization of the medium-low frequencies, either by filling the gap at 250 Hz or by getting rid of the hump at 400 Hz.

Phase-frequency response

The phase response is quite good, with a perfectly flat curve in the high ranges, which then undergoes a first rotation through 360° in the crossover band. The delay occurring in the low-frequency area is constant and natural, bearing in mind the high-pass filter used for protecting the woofer.

Directivity

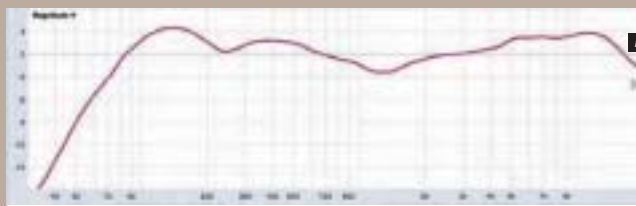
The trace of response variations in the horizontal plane shows quite good behaviour in horizontal directivity, even if it suffers from a few problems compared with the advertised aperture characteristics at 40° outside the axis. In the vertical plane the variation trace shows that the asymmetrical horn has good control over directivity. Once again in this case, a slight

narrowing can be noted in the overlap zone, but the 0/-6 is nevertheless achieved in general over the audio band as a whole.

LISTENING TEST

As the descendant of a family which is widely sold and appreciated throughout the world, the EON 515XT did not quite fulfil our hopes, even forgetting for a moment what has made the impact of this legendary brand: its musicality. The bass tones are well reproduced with plenty of body, dynamics and extension, but without really delivering that characteristic JBL punch. The medium ranges seem rather veiled, an impression which is confirmed by the higher medium frequencies where sometimes, in addition, a touch of colour occasionally comes and blurs reproduction. With voices, this is immediately noticeable. Finally, the high frequencies are efficiently reproduced, but without really delivering the "plus factors" of this brand, and also without offering an element of neutrality which is sometimes practical. Overall reproduction is pleasant, but lacking in clarity and accuracy. Dispersion is regular, but with a pretty steep gradient outside the vertical axis. When heard right at the limits of its performance the EON 515XT copes with ill treatment without problems, delivering a sound that is consistent, even if it is clearly limited and less lively in the higher frequencies than other speaker units in the comparison.

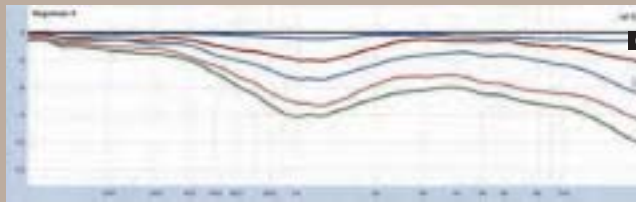
MEASUREMENTS AND TESTS



A



B



C



D



E

- A/ A smiling amplitude response.
- B/ A fairly conventional phase performance, considering the filters used.
- C/ Response variation in the horizontal plane from 10 to 10°.
- D/ Response variation in the vertical plane above the median plane.
- E/ Response variation in the vertical plane below the median plane.

MASTER AUDIO NT15A500.



01 / The woofer.

OUR OPINION

WE LIKE

Perhaps the price, but for this quality it is still much too expensive

WE DON'T LIKE

The directivity, which is absolutely not under control

The lack of tonal balance

The quality of finish, which is not worthy of the products in this comparison

INFO / DISTRIBUTOR

DISTRIBUTOR: Master audio

GUARANTEE PERIOD: 3 years

Developed in: Spain

Assembled in: Spain

Average price including taxes: 749 Euros

People don't just build dreamy castles in the air. They also build sound reproduction equipment. Master Audio is a manufacturer of amplifiers and diffusers from Catalonia and, although making 70% of its turnover through export, remains very little known north of the Pyrenees.



02 / The tweeter.

03 / Class AB for high frequencies, Class D for low frequencies.



The NT15A 500 moulded speaker unit tested here is part of a range which, in price and performance, is directed rather at the general public than at the more demanding market for professional sound reproduction.

DESIGN

At first sight, the thing which distinguishes the MT15A 500 from its fellows is the use of an elliptical wave guide, which is rather unusual for this type of model. I will be commenting on the consequences of this choice on the electro-acoustic performance of the speaker in the Measures section, but from a design point of view one must admit that, by choosing this option, its designers have demonstrated a certain originality. The front face is a model of integration, with its 2 large triangular vents that fill the spaces available between the boomer grille and the mouth of the horn.

With regard to ergonomics, this speaker is well provided with 4 M10 inserts for suspension, a 35mm housing with tightening screw to take a tripod stand and 2 carefully positioned handles to facilitate handling. The rear shell is in the form of an asymmetrical pentahedron. One of its faces is angled at 45° to permit use as a stage monitor, and at the same time is hollowed out to receive the control and connection panel. With regard to its general appearance, even though the unit is ergonomically well designed, the woofer grille and the ebony polypropylene shell are too thin and lack rigidity. The finish on the moulding is rather rudimentary, with lumpy surfaces and the edges between the shells have not been de-burred.

The inside walls of the casing merely receive a thin lining of mineral wool material as the only means of damping.

THE TRANSDUCERS

The AMA 15-1 woofer from Master Audio is a very lightweight design, built around a 6-spoke basket in cast aluminium. At its centre is incorporated a compact neodymium magnetic circuit, the circumference of which carries a radiator with fins arranged in star formation. These have the job of evacuating the heat produced by the 4Ω coil. The conical membrane, which is very rigid, in moulded paper, is attached to the basket by an accordion suspension in coated fabric.

The electrical connections are via 2 spring terminals. The compression chamber has quite a large volume; it is very probably a bass-reflex design.

Master Audio has chosen to mix technologies since, in contrast to the woofer, the tweeter has an impressive magnetic circuit in ferrite. This single component of the HF driver alone weighs more than the bass speaker in its entirety! The 1.5" (34mm) dome membrane is made of titanium and communicates with the horn throat via the compression chamber. The latter includes an annular phase transmission component in plastic/stainless-steel composite material. At the exit of the chamber, dust-tightness is ensured by a circular filter in fine metallic trelliswork which, on our model, was partly blocked by glue deposits.

PROCESSING AND AMPLIFICATION

The control and connection panel is very much reduced, even simplistic. Directly by the side of the traditional IEC mains connector, the on/off switch with its built-in indicator bulb seems like a relic from another age.

PRODUCT SELECTION DOSSIER / 8 SPEAKERS

As far as the audio side is concerned, this is reduced to one volume control knob and two XLR connectors, one for input and the other for a parallel output. The input sensitivity is +6 dBu for an impedance of 10 kΩ. Two indicator lights, one per range, indicate the operation of the limiters. The electronics are situated on two quite different printed circuits. The first, which is principally dedicated to the 60W Class AB amplification of the high frequency band, also supports the input stage and the distribution filters. These are stated as being 24dB/octave, but without their crossover frequency being defined. On the rear side of the printed circuit, one can see 4 adjustable controls intended for adjustment of the thresholds for the limiters and illumination of the LEDs. The second printed circuit is more familiar to me. It is much more compact and carries a 500W Class D amplifier supplied as an OEM unit by B&O. In spite of this quite respectable power, the speaker unit is advertised as producing only 124dB SPL (peak) at one meter, which in fact represents a modest performance compared with the competition.

MEASUREMENTS

Response curves within the axis

One initial observation stands out on reading the amplitude frequency curve: the response is out

of balance. The high frequency driver is lacking 3 to 6dB in sensitivity, compared with the performance of the 15" speaker, and lacks linearity. As for the woofer, it has a better controlled response, but its bandwidth cuts out too soon in the low frequencies. This is disappointing for a speaker of this size. However, looking at the phase response, the designers do not seem to have restrained it with a high level subsonic filter. In the mid band, one sees that the phase curve inverts its slope at around 180°. The coupling between the tweeter and the woofer has not been optimized.

Directivity

Due to the choice of an elliptical horn and an HF driver with very average performance, directivity control only operates across a very limited range (between 4 and 8 kHz). The coupling, as far as I can see, has probably been designed at too high a point to obtain a homogenous response in horizontal dispersion. However, could the designers really have done otherwise, with the HF driver and its non-exponential horn loading being, of course, incapable of descending any lower? In Figure 3, from 40° the curve goes outside the 0/-6dB bracket and in a very critical manner between 2 to 4 kHz. The 110° aperture advertised by the manufacturer is absolutely unrealistic.

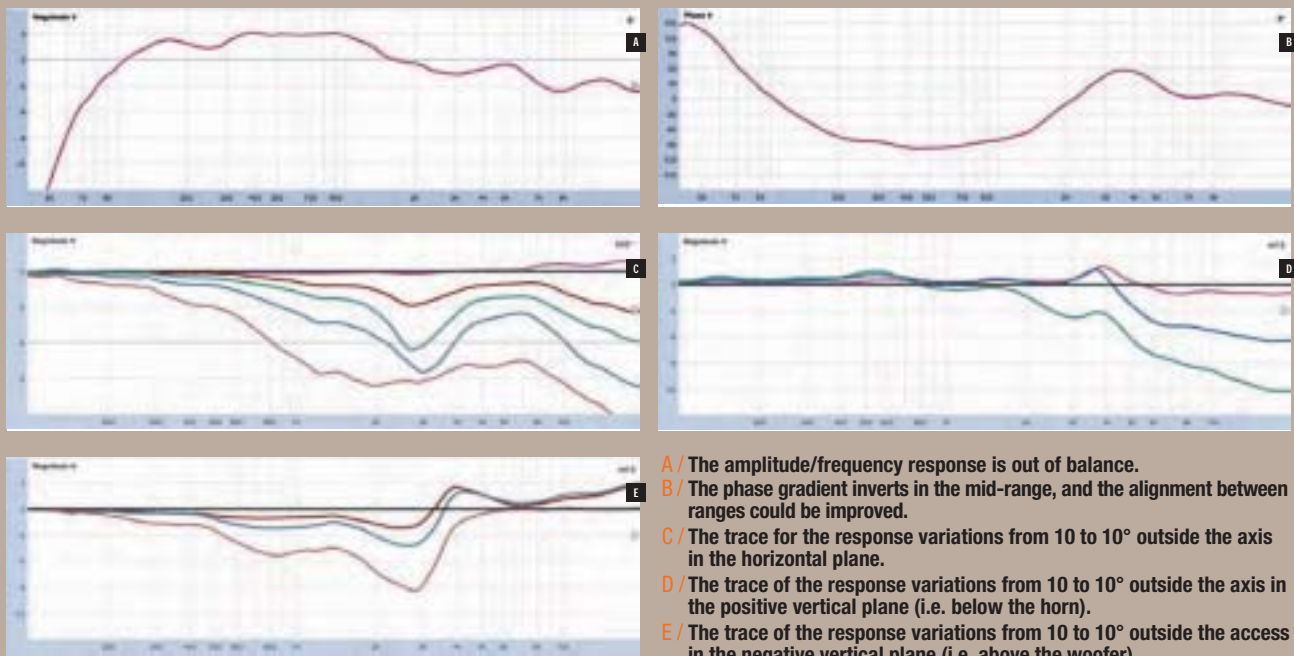
In the vertical plane the aperture remains within 40°, which is again far from the 70° promised by the manufacturer.

LISTENING TEST

The fact that its price is among the lowest in the dossier does not explain and, above all, cannot justify such half-hearted reproduction. The lack of balance between the bass and treble ends of the spectrum, the directivity that is unworthy of a 2011 design, the last octave that is hardly reproduced in spite of the 15" speaker which, to top it all, is supposed to be of star quality - everything conspires to turn the NT15A 500 into a sad non-event.

To the ear, the low register is dry, thin and, in spite of its low extension, does not pack much of a punch. The mid bass is present, perhaps too much so, just like the mid-range which, in addition, suffers from a large amount of colouration and directivity. On the other hand, the high-medium range dives down, assisted by a very unusual interaction between the membrane and the driver. The treble is present, and is not bad, not actually weak but simply masked and not really brought out enough. The whole thing looks very skimpy and even at high volume does not seem to produce sound with sufficient power to compensate for its faults. Finally, coverage is only normal at + 15°, and beyond that reproduction becomes even more unacceptable, due pure and simply to the disappearance of the useful signal.

MEASUREMENTS AND TESTS



PEAVEY PR15D



01 / The woofer of the PR15D is really light in weight.

OUR OPINION

WE LIKE

The price
The volume/weight ratio

WE DON'T LIKE

The mediocre performance
Directivity control

INFO / DISTRIBUTOR

DISTRIBUTOR: Peavey

GUARANTEE PERIOD: 5 years

DEVELOP IN: USA

ASSEMBLED IN: China

AVERAGE PRICE INCL. TAX: 648 Euro

The core target for Peavey is primarily the vast market for amateur musicians and also DJs, the main sales argument for these entry-level products being the very aggressive pricing policy. The PR15D is no exception to the rule. And to prove it, this speaker unit which is dimensionally the most impressive in our comparison is nevertheless the cheapest. These Americans are just too good! But how do they do it!



2



3

02 / The very classic RX14 compression driver.

03 / The amplifier, all CLASS D.

Firstly, by making important savings under the R&D heading, while profiting as much as possible from the production chain...

DESIGN

This is why, at the risk of confusing the consumer in his selection, the PR15D has the same shell as the Impulse 1015, a passive speaker unit with fairly adequate performance, but in a superior quality range.

This box, which is common to the two ranges, is of anthracite-coloured injected polypropylene, with a nominal thickness of 6.35 mm. The shape is strictly trapezoidal, without any specific inclined surface for possible utilization as a stage monitor. In spite of this omission, it has quite a complete set of equipment with a mounting recess for a tripod, together with an azimuth fixing screw. In spite of its considerable volume, the enclosure weighs less than 17kg. Its featherlike weight and 2 ergonomic handles fitted in the sides enable the PR15D to be easily fixed onto a tripod stand, even by one person on his own. The box looks tough, but it's a pity that in contrast to the finish observed on the Impulse the inside of the shell has not been provided with stiffeners or damping fabric.

TRANSDUCERS

The 38cm speaker is built around an 8-spoke basket in pressed metal. The paper membrane is fitted with a circumferential accordion suspension in coated fabric. The heart of the driver, which is quite compact, consists of a neodymium magnet with 6 ventilation wells and one decompression vent. Compared with the size of the membrane, the 2.375 inch (6cm) coil is of reduced diameter. Its impedance is 8Ω. The

whole unit is extremely light, but not very powerful. Rear loading is of the bass-reflex type and makes use of 4 triangular vents, each coming out at one corner of the protective grille. The resonant frequency is 55Hz. Here, Peavey is using its traditional little RX14 compression driver with a ferrite magnetic circuit.

Its very light 1.4 inch titanium dome diaphragm carries at its circumference an 8Ω Kapton coil with ferro fluid cooling. The compression driver terminates in a 0.9 inch diameter throat, which is connected to the entrance of the horn via an intermediate metal plate. The horn has constant directivity. Its aperture angles are respectively 90° horizontal and 40° vertical. The power carried permanently by the HF driver is only 30W, but with a sensitivity advertised at 104dB/1W/1m; once it has been linked up to the horn, this is more or less adequate considering the modest performance of the woofer.

ELECTRONICS

On the back of the speaker, the control and connection panels are arranged in two quite distinct sections on either side of the cooling radiator. The lower part is reserved for the mains supply with an IEC connector and an on/off switch with indicator light. The upper panel has all the audio side, with the main input as a combo connector provided with an earthing eliminator. The entry level can be adjusted both via a volume control and by using a 30dB attenuator allowing the use of a mic or line level. The link-out uses a 6.35mm jack and is provided after the volume control. Finally, there is a direct input, also in the form of a 6.35mm jack, which short circuits the pre-amplification section of the speaker unit.

PRODUCT SELECTION DOSSIER / 8 SPEAKERS

There are two 2-colour LEDs, one showing the entry sensitivity selected and the other showing operation of the DDTM limiter. The latter indicator lamp is very appropriately repeated on the front face of the enclosure.

The electronics are set out on 5 high-quality printed circuits. The Class D amplifier provides the necessary power of 150W for the woofer and 50W for the tweeter. These rather modest power ratings do not allow the PR15D to achieve sound pressure performances in excess of 120dB SPL. With regard to processing, the distribution filter uses 3rd order gradients with a crossover frequency set at 2 kHz, i.e. at the limit of the bass register recommended for the RX14 compression driver. Peavey uses parametric corrections at the extremities of the audio range, on the one hand, for compensating the natural behaviour of the constant directivity horn at high frequencies, and on the other hand, for extending the response of the woofer in the low frequency range before its proper cut-off frequency.

MEASUREMENTS

On-axis responses

The amplitude-frequency response is within a bracket of + 3dB from 55 Hz to 20 kHz. The accentuation noted at 6 kHz is traditional for a measurement made inside the spot for a

constant directivity horn. Beyond this frequency, the gradient at -6 dB/octave ought to have extended right to the end of the audio range, if this natural behaviour had not been counteracted by a judicious correction made to the last octave.

The phase response, bearing in mind the 3rd order filters employed, shows a good temporal alignment of the transducers. The multiple rotations in the bass register are essentially the consequence of the subsonic filter.

Off-axis responses

For a two-way speaker unit with a 15" speaker and a large aperture horn, the choice of a 1" compression driver is indefensible. The performance of the PR15D provides no exception to the rule, and the graph of the variations, particularly in the horizontal plane, confirms that from 30° outside the axis the directivity performance advertised by the manufacturer has not been respected; and this is in spite of the fact that the control of the horn over its whole operating range is appropriate. In the vertical plane, below the median plane of the speaker unit, which is where the audience is usually located, the variations trace shows an appropriate directivity, as is witnessed by the blue curve (at -20°) which remains within a bracket of 0/3dB. Above the median plane,

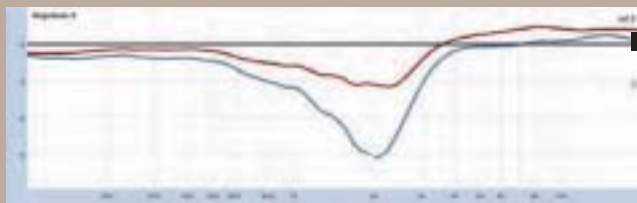
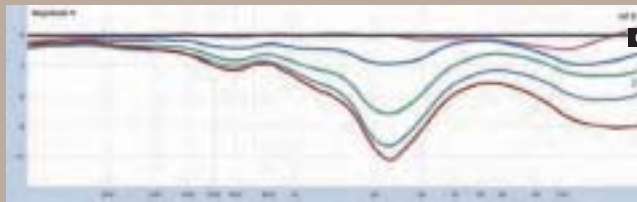
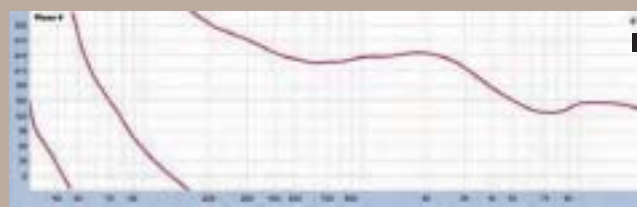
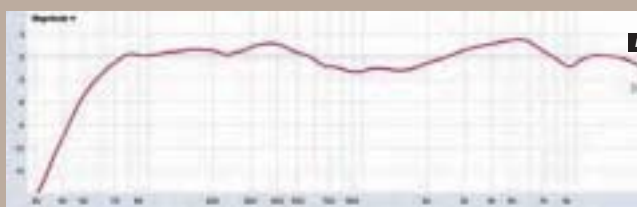
which is not a very usual listening position for a unit used exclusively on front, the narrowing in the mid-range once again sets in very quickly.

LISTENING TEST

Although full of courage and generosity, the reproduction of the PR15D cannot entirely escape criticism, in spite of its low-end selling price.

The bass register descends well, with a fine roundness, but is rather soft and lacks precision. The coupling with the compression driver produces some accidental noise around 2 kHz, and a hump in the 6 kHz frequencies generates hardness, especially for the sibilants. This rather chaotic behaviour in the mid and treble sections is completed by a slight lack of sound pressure in this range, even if the measurements do not seem to show up this "hole". However, the high-end treble is present, and at high volume it seems to come out much better. In fact, at high volumes the PR15D comes off pretty well, in spite of the very reduced power of the two packs compared with the other models, and the limiter takes care of the texture by progressively reducing the level in the bass register before doing the same at the high end of the spectrum, all of which works quite musically. The aperture is correct and the fall-off at the sides is regular, even though quite rapid. Good for practical applications, especially for DJs and programmes of "mastered" music.

MEASUREMENTS AND TESTS



- A / Amplitude-frequency response within the axis, the bandwidth is very extended.
- B / The phase frequency response is very satisfactory.
- C / Amplitude response variation from 10 to 10° in the horizontal plane.
- D / Amplitude response variation from 10 to 10° in the vertical plane below median axis.
- E / Amplitude response variation from 10 to 10° in the median plane above the median axis.

RCF ART 725-A



01 / The RCF's anonymous woofer.
There is no label to remind us that this is in fact a component from the brand itself.

OUR OPINION

WE LIKE

The dynamic performance
The excellent directivity control

WE DON'T LIKE

The rather restricted bandwidth in the extreme low register

INFO / DISTRIBUTOR

DISTRIBUTOR: RCF France

GUARANTEE PERIOD: 3 ans

DEVELOPED IN: Italy

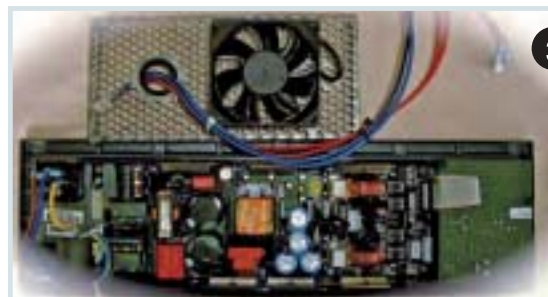
ASSEMBLED IN: Italy

AVERAGE PRICE INCLUDING TAX: 1240 Euros

In 2008 the Italian manufacturer RCF created the ART 7 series and showed both that, when it comes to mobile sound reproduction, lightness and power are not necessarily incompatible, and also that a moulded enclosure can offer aesthetics which are radically different from the competition without necessarily sacrificing any of the acoustic or ergonomic qualities of the product.



2



3

02 / The 2.5" ventilated suspension diaphragm, the key component in the top-of-range HF driver.

03 / The Digipro 1000S amplifier with forced ventilation.

In a monochromatic landscape, full of consensual curves, the ART 725-A seeks to assert the originality of its style, composed of taut lines, sharp edges and clear-toned aluminium inserts recessed into a dark background.

DESIGN

The first thing that attracts one's attention is the front of the unit. And to be more precise, the form of its horn, brutally interrupted by the immense profiled vents of the bass-reflex loading. In complete contrast, the grille of the woofer in its initial section extends the abrupt design of the wave guide so as to describe a perfect semicircle at its base. The rear half-shell is pentagonal. Its lateral walls are angled at 40° so that the enclosure can be used as a stage monitor.

The rear face incorporates on either side of the cast aluminium radiator the control and connection panels for mains and audio.

The ergonomic accessories are fairly comprehensive, starting with the 3 handles that enable the speaker to be moved and easily positioned on a tripod. The 36mm recess provided for the purpose is unfortunately not provided with a tightening screw. 2 M10 inserts are provided for attaching the ART 725-A on an optional attachment plate. Inside, by way of stiffening, the shell gets a transverse plank in plywood, and the only dampening material is a strip of polyester fibre on its side walls.

THE TRANSDUCERS

The woofer is constructed around a simple 6-spoke, pressed metal basket, the central section of which seems to be over-dimensioned

compared with the size of the magnet that it supports, which is nevertheless rather small. The magnetic circuit in neodymium has 6 ventilation wells, in order to dissipate the energy absorbed by the 3.5" (89mm) diameter coil with 4Ω nominal impedance. The conical membrane in paper pulp is rigid. Its circumferential, half-roll suspension is made of coated fabric. With regard to the top end of the sound spectrum, the job is given to an in-house compression driver fitted with an imposing 2.5" (63.5mm) titanium dome diaphragm with a ventilated suspension.

The aluminium wire coil is 2.5" in diameter. The neodymium magnet is large in size and super-powerful. All the components of this driver have a high-quality finish. The compression driver, supported by a special metal plate, leads out into the throat of the constant directivity horn which has the job of reproducing the 1200 Hz-20kHz range within 90° in the horizontal aperture and 60° in the vertical aperture. This would normally be adequate to let the medium and high registers ring out loud and clear in a large auditorium.

PROCESSING AND AMPLIFICATION

The control and connection panel is very simple, with one combo entry connector, type XLR female/TRS jack, and an XLR male signal output, a volume control and 4 electro-luminescent diodes to indicate on/off, the presence of the audio signal, activation of the limiter, and the last one labelled "status" for giving a warning in case of overheating. Finally, there is a "flat/process" switch enabling the activation

PRODUCT SELECTION DOSSIER / 8 SPEAKERS

of a physiological filter which has the job of accentuating the extreme ranges of the audio spectrum. Class D amplification, very well thought out, was placed in the hands of Digipro, a subsidiary of the RCF Group, which supplied its 1000S OEM module for the occasion. This delivers 500W to the 4Ω woofer and 25W to the 8Ω compression driver, respectively. At full power, the ART 725-A is capable of delivering 131dB SPL peak.

MEASUREMENTS

Amplitude-frequency response

Within the axis, the amplitude frequency response favours the bass (+3dB at 100 Hz) and the treble (+1.7dB at 12 kHz) whilst burying the mid range (-2.7dB at 2.5 kHz). The designers of this speaker unit deliberately chose to play the “seduction card”, thanks to the DSP equalization resources. At the outset, they have achieved a flattering curve which, thanks to this device, enables the bandwidth to be held within a bracket of +6dB for the bandwidth from 60 Hz to 20 kHz. Engagement of the physiological filter only serves to accentuate this bewitching “smile”.

Phase frequency response

The phase response is well controlled with a very flat phase over the whole of the horn’s reproduction range. Then comes a sudden

rotation at 360°, in the narrow overlap range of the distribution filters, which is a result of the high order gradients used. Lower down, the delay in the bass register becomes more accentuated with the use of a high pass filter intended to protect the woofer below its own cut-off frequency.

Directivity

The trace of response variations in the horizontal plane shows a remarkable directivity performance. Of its type, it’s certainly the best thing they could do, with a 2-voice box fitted out with a 15” loudspeaker. The choice of a relatively low cut-off frequency, possibly thanks to the use of a high performance compression driver, avoids the general collapse which has been observed for the response in the mid band. In the vertical plane, the variations trace also shows good directivity behaviour. The slight divergences noted in the mid-range relate only to the narrow coupling between the transducers.

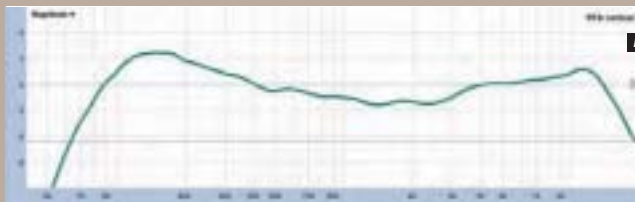
LISTENING TEST

Impressive, and well-known from now on, the RCF ART 725-A delivered high-quality reproduction without any noticeable accidents which, considering its price at the upper end of

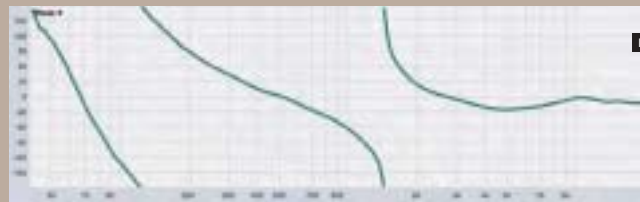
the spread, is an absolute necessity. The bass register is attractive, round, with a certain amount of attack and demonstrating an attractive personality and extension. The bass medium and the mid-range are lacking a smidgen of oomph and level at normal volume, a situation which gets back into balance without any hardness once you really turn on the power. The medium-high and high ranges are perfectly reproduced with an element of personality which rings out agreeably and with a slight physiological hump which well complements the one in the bass register. This touch of personality is welcome because it somewhat brightens up the more than exemplary neutrality, which gives this speaker unit its versatility, one of its strong points. Dispersion is satisfactory, with the usual more or less regular fall-off once you depart from the preferred axis of the compression driver.

When pushed back onto its mounting plates, the RCF ART 725-A delivers a considerable sound level without any risk of breakages, while the quite musically-orientated limiters cut in first on the bass amplifier, before the treble does the same. This time lag between the two limiters means that those “guerrillas” who never even look at a VU meter are going to have quite a lot of high frequencies in their output...

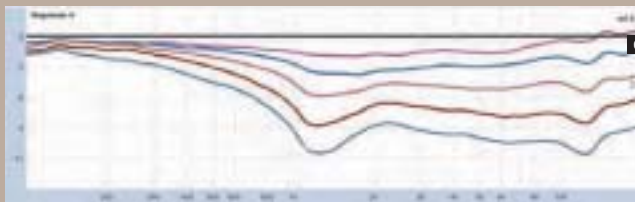
MEASUREMENTS AND TESTS



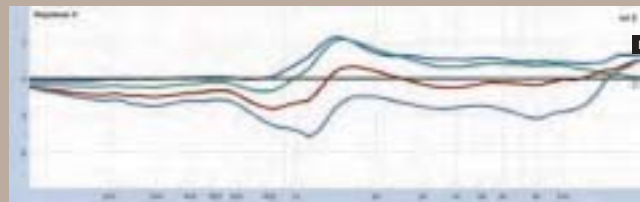
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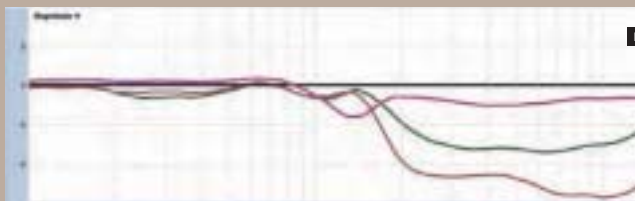
B



C



D



E

A / A “smiling” response, even in the “flat” mode.

B / The phase is well under control.

C / Response variation in the horizontal plane from 10 to 10°.

D / Response variation in the vertical plane above the median plane.

E / Response variation in the vertical plane below the median plane.

CONCLUSION

In an exercise that has become almost a habit, but which continues to be much appreciated within the Sono editorial team, this new comparative study of speaker units has delivered its share of present surprises, disappointments and interesting findings. On this last point, we find that it is not everybody who can couple a compression driver with a 15 inch woofer. What is the point of advertising a box with a 900 aperture, when at 200 it loses its colour like a red t-shirt washed at 90 degrees? We were just as surprised by the performance of limiters installed against all good sense and which chop the signal to bits. Some manufacturers have also clearly forgotten the meaning of good cabinet-making, sealing or rigidity, thus spoiling the work of speakers, which would no doubt be capable of more. And finally the prices. China or no China, we often found the prices too high for the power and other advantages offered. The accumulated margins of the manufacturer, the distributor and the retailer push the prices of these speakers up to heights which may well mean that they stay in their packages – which are sometimes not padded enough. Looking in detail, and going from bottom to top, Master Audio should take another look at its blueprint, as the reproduction is not worth the investment, and loses marks above all when you realise that this company has been in business for 38 years. Peavey has the ability and the knowhow to do better, because at 1300 euros a pair, it would be easy to set up a passive configuration that would be at least equivalent. DAS produces speaker units which are professional and well designed. But why do the “affordable” series not sound as well as they could, and why are they fitted out with those pre-set accentuations? It’s a mystery. dBTechnologies comes off well and gives us a serious speaker, with an

interesting degree of neutrality, even if it seems rather flat compared with the others. JBL, which has accustomed us to greater musicality and rigour in sound reproduction, seems to be taking time out with this new model. The EON 515 XT functions well, has no major faults, but is not seductive, and in the end doesn’t get onto the podium. Spare the rod and spoil the child! So now we are left with the three leaders, consisting of two Italians and one American – which doesn’t necessarily mean that this will become a habit. **If we take into account price as well as performance, the real winner is the FBT, which gets top marks for quality, power and musicality, without taking up too much space or weighing too much – the neodymium, Class D and the plastic all make their mark.** The RCF is too expensive, but apart from this failing, the rest is fine. It has sound, power and musicality, and if you can get a good deal on this model (which after all is quite old) buy it and consider yourself lucky. So we’re left with Electro-Voice. If you are looking for professional speakers to provide front fill and amplified sound, or if you really want the best in terms of dynamics and sound level, the ZXA5 is made for you. Admittedly, they cost over 50% more than the most expensive of the speakers in this comparison, but they deliver more, and over a greater distance, so if you think you can master their passion and their top SPL level, reach for your cheque book. And for everybody – listen well - their limiter isn’t worth a bean and the SAV is always rather faulty.

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		DAS DR-115A	dB TECHNOLOGIES OPERA 605D	ELECTRO-VOICE ZXA5	FBT ProMaxX 14	JBL Eon 515XT	MASTER AUDIO NT15A500	PEAVEY PR15D	RCF ART 725-A	
P	E	XLR F	XLR F	Combo XLR/jack	XLR F	XLR F/2 jacks TRS	XLR F	XLR F/jack 6,35	Combo XLR/jack	
P	E	XLR M	XLR M	XLR M	XLR M	XLR M	XLR M	Jack 6,35	XLR M	
PEA	A	P E E	130 dB SPL	130 dB SPL	133 dB SPL	135 dB SPL	132 dB SPL	126 dB SPL	120 dB SPL	131 dB SPL
P	E	300 (D)/100 (AB)	400/200	1000/250	600/300	525/100	500/60	150/50	500/250	
E	E E	-	1670 Hz	1,5 kHz	1,3 kHz	1,7 kHz	3 kHz	2 kHz	1,2 kHz	
PE		90° x 45°	80°/60° x 60°	-	90° x 60°	100° x 60°	110° x 70°	90° x 40°	90° x 60°	
A	3	-	68 Hz - 19 kHz	58 Hz - 18 kHz	45 Hz - 20 kHz (- 6 dB)	42 Hz - 18 kHz	-	47 Hz - 20 kHz	70 Hz - 18 kHz	
A		45 Hz - 20 kHz	59 Hz - 20 kHz	50 Hz - 20 kHz	-	39 Hz - 20 kHz	50 Hz - 20 kHz	-	50 Hz - 20 kHz	
A	E	1,34"	1,75"	2"	1,4"	1,5"	1,5" titane	1,4"	2"	
P	E	-	-	100 Hz	-	-	NA	NA	-	
P	G A E	-	-	NA	Programme DSP	Baxandall ± 6 dB	NA	-	Boost	
A	G	Polypropylene	Polypropylene	Polypropylene	Polypropylene	Polypropylene	Polypropylene	Polypropylene	ABS	
A	E	IEC	IEC	Powercon	IEC	IEC	IEC	IEC	IEC	
E	mm	710 x 460 x 420	655 x 432 x 353	692 x 446 x 411	644 x 402 x 345	673 x 406 x 368	700 x 445 x 406	-	-	
E G		22,1 kg	12,9 kg	22,9 kg	16,5 kg	14,8 kg	20,7 kg	16,4 kg	19,4 kg	
		Axente	Audiopole	EVI France	Major Audio	SCV Audio	Master Audio	Peavey France	RCF France	
P	E G A	EP GA	897 €	819 €	1930 €	1160 €	930 €	749 €	648 €	1240 €

Data from Manufacturer