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An enormous number of successful recordings have been produced on Tannoy Monitoring since the first introduction of the Tannoy Dual Concentric loudspeaker in the 1950s.

A decade has now passed since the introduction of the Super Red and upgraded Super Gold series of Tannoy Monitors. During this time they have earned an enviable reputation as the definitive standard for UK, European, Australian and North American recorded sound production monitoring.

But it is easy to bury the requirements of monitor loudspeakers in a mass of superfluous technical specifications and smooth sales features. The proof of successful engineering design is measured in the opinions of the users and ultimately their success in producing programme material that is commercially and artistically welcomed by the customer.

It is no coincidence that Tannoy has been instrumental in this process since commercial recordings first became available. Tannoy engineering philosophies have always been precise, no-nonsense, realistic and without gimmick features. We never add a feature unless it has direct benefit to the user.

The Dual Concentric design philosophy is world famous for its precise stereo imaging and for the case of finding sounds within a sound stage. The present range of studio monitors are of long production history. It is the feeling that with such a massive track record successive developments can be built on and corrected for acoustic anomalies in the time and frequency domains.

During the last 15 years great strides have been made in the analytical understanding of loudspeakers. In parallel, the explosion of computing power available to physicists, electronics, acoustics and mechanical engineers has resulted in loudspeaker design techniques advancing at a faster rate than ever before.

Tannoy's massive experience and its highly innovative and skilled design engineering team, has placed the company in a most enviable position. This is reflected for the 1990s in what is a truly exceptional—revolutionary rather than evolutionary—range of studio monitors.

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Be very careful when lifting the larger models as they are very heavy.
Particles of packing material can be removed from the cabinet and grille surfaces with a soft brush or proprietary clothing lint remover.

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Decide whether you want to set up using normal wiring or Bi-Wiring. If you choose Bi-Wiring you will need to arrange for two separate twin-core cables from each channel of the power amplifier to each speaker position. The benefits and philosophy behind the Bi-Wiring principle are outlined in the technical section of this manual — see Section 5.

In either case please use cable of at least 2.5 square millimetre (2.5 mm²) cross sectional area.

For normal operation just check that the Bi-Wire selector is in the normal position with the Tannoy logo on the selector block nearer the red and black terminals. Connect the power amplifier to the terminals marked HF (high frequency) observing the standard polarity conventions, red to red and black to black. This will ensure positive acoustic polarity provided the associated electronics is suitably configured.

For Bi-Wire operation slacken off the red and black terminals sufficiently to allow the Bi-Wire selector block to be pulled upwards to show the words 'Bi-Wire' and tighten one red terminal to hold it in place. Connect one of your twin core cables to the red and black terminals marked LF (low frequency) and the other twin core to the terminals marked HF. Please make sure that polarity is observed.

At the power amplifier, connect the two twin core cables together, positive to positive, negative to negative. This will give a fixed increase or decrease in the output of the HF unit by 1.5 dB over the range 2.5 kHz to 25 kHz. Slide the link mechanism between the blue terminals to give the response as shown on the connecting panel.

The speakers are now ready for use. Please read the technical specifications regarding power handling before use on amplifiers with a power output greater than 300 watts per channel (max 8 ohm (or 150 watts for System 6) — see Section 7.

If you feel that the high frequency level requires adjustment because of environmental or commercial circumstances then the HF link on the rear connecting panel may be set. This provides a fixed increase or decrease in the output of the HF unit by 1.5 dB over the range 2.5 kHz to 25 kHz. Slide the link mechanism between the blue terminals to give the response as shown on the connecting panel.

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We would like to give a word of warning on high sound levels, which can be dangerous over long periods of time. Hearing damage is caused by high sound levels sustained for long periods of time. Levels over 95 dB for 8 hours per day will eventually cause permanent hearing loss. Because Tannoy Monitors have very low levels of time, amplitude and frequency distortion it is not always obvious that the sound level is high while working with them.

For continuous exposure we recommend the occasional use of a noise dosimeter capable of integrating the sound level and the period of exposure according to noise control standards. This should be used just to check that noise exposure levels are always within safety limits.

The major factors which you should consider when planning a speaker installation using Tannoy Monitors (or anyone else's monitors) can be summarized:

- physical location and mechanical mounting or support structure for the speakers
- connections from power amplifier to speakers
- type of power amplifier, power rating and configuration
- duty rating of the speakers and consequently the depth of on-site servicing requirements.

Mounting of loudspeakers provides the single largest influence in performance. For best results the Tannoy Monitors must be mounted on a rigid structure, supported on four pads making contact with the laminated panel.

The nature of the support will safely change the sound quality. Using a sharp point contact (very high pressure over a small area) will reduce the interaction of the low frequencies with difficult room acoustics over the 50 to 150 Hz frequency band and will give a generally brighter sound presentation.

Using soft pads, of say rubber or Sorbothane, will produce a warmer sound change in the 100 to 200 Hz area and a slightly more subdued treble quality. We recommend using pads of Bostik Blu-TackTM of about 10 mm in diameter for optimum results.

Front mounting can be wall (on/off) mounted but make sure that the front panel is slightly proud of the wall surface by 10 to 15 mm. They must not recessed into a wall cavity because of diffraction effects which will smear the time response. With this method of mounting the comments made above regarding the support of the speaker on points or pads still apply.

Two options available when connecting the speakers to the power amplifier:

use ONE normal twin cable with the Bi-Wire selector on the rear panel set to NORMAL.

Initially we would like to give a word of warning on high sound levels, which those speakers are capable of generating over sustained periods of time. Hearing damage is caused by high sound levels sustained for long periods of time. Levels over 95 dB for 8 hours per day will eventually cause permanent hearing loss. Because Tannoy Monitors have very low levels of time, amplitude and frequency distortion it is not always obvious that the sound level is high while working with them.

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Location and the Loudspeakers

Location and Support for the Loudspeakers

Connecting the Loudspeakers

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Bi-Wire operation gives significantly better sound quality for a modest outlay in extra speaker cables. Bi-Wiring allows high frequency and low frequency identical crossovers to be split between two cables and therefore complete potential differences across the cables (due to resistive losses and reactive components) do not interact.

Remember that with dynamic range of 80 dB to 100 dB in the recording process the high frequency crossovers necessary for correct reproduction of a sound waveform may be around 60 dB or more down from the low frequency crossovers. At these levels the potential difference across the LF cable may easily swamp the HF signal in the region at crossover unless Bi-Wiring is used.

The Bi-Wiring principle also continues the wiring philosophy within the crossover of all Tannoy speakers in that all earthing points should be one wire to the source terminal to prevent common earth paths.

The type of cable used to connect the speakers to the power amplifier will marginally affect the sound whether it is normal or Bi-Wire mode. There will be more differences between cables of less than 2.5 mm² area in the normal mode and so we recommend cables equal to or greater than 2.5 mm² together with Bi-Wire operation for best results.

It is worth experimenting with very pure oxygen-free or large crystal cables as these can resolve fine detail which would otherwise be missed. If these types of cable are used then the cross-sectional area specification referred to above need not apply rigidly.

Tannoy does not recommend the use of certain plated or coated cables since their high capacitance can lead to instability and oscillation in some power amplifiers together with some loss of high frequency definition.

The Tannoy Monitor range will accommodate connection by 4 mm banana or speakon connectors.

When connecting the speakers it is essential that consistent polarity is observed. The red terminal on the loudspeaker must be connected to the red or positive terminal on the power amplifier, and the black terminal on the loudspeaker connected to the black, negative or ground terminal of the power amplifier.

The power amplifier should be reasonably well matched in power to the power rating of the speakers. Tannoy Monitors are very efficient and it can be tempting to use a small power amplifier. However if the power amplifier is not capable of fine detail and dynamics the power amplifier should have sufficient voltage swing which usually means a higher power output specification of say greater than 150 watt.

The power specification of the speakers has been measured on a continuous basis using well documented industry principles. The recommended use of a high power amplifier for sound quality reasons assumes that the speaker will not be subjected to the full clipped output of the amplifier over a sustained period of time. As with all monitor speakers most of the power from the

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Power Amplifiers

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completely separated from each other.

It is chosen then it is absolutely essential that the power amplifiers supply the same specification. Although the HF section of the loudspeakers need more power energy at the LF section, it needs just as much voltage energy to deliver its dynamic range. Additionally it is essential that the phase relationships across the audio band are preserved and therefore if bi-amp driving is chosen, identical power amplifiers are required.

The output performance of the Tannoy Monitor is directly related to the power amplifier output. The conversion of electrical power from the source to sound energy is proportional to the sensitivity specification of the Monitor. Please read the full technical specification for details.

In dynamic range, an amplifier of no less than 150 watt per channel should be used on Systems 6, 8 and 10 and 300 watt per channel for Systems 12, 15 and 215.

Locate the monitor so that the listening position at the console is approximately 10-15 degrees from the axis of the Dual Concentric drive unit. This will give the optimum spread of TIF information.

Between the two speakers should be between 2 to 4 inches. Depending on control room size, where possible avoid mounting the speakers close to walls, floors or ceilings. The distance between the monitoring position and each speaker should be slightly greater than the distance between the speakers.

Please note if the speakers are placed too close to each other the full stereo image may not develop, on the other hand if you place them too far apart you will notice an audience hole in the middle of the stereo image.

Ensure that the console position does not obscure the direct sound radiation from the Dual Concentric drive unit when sitting down; the engineer and producer should have a clear uninterrupted view of the monitor loudspeakers.

If the loudspeakers are used within their rated specifications then they will provide long, reliable service. In a commercial world, however, it is often impossible to guarantee that the monitoring system will not be abused in some way. The best way to ensure this is without doubt to keep the monitor's usage to a minimum. All the time the expected life of the mechanical components and drivers requires maintenance. Therefore it is sensible to keep spare parts for on-site service where monitor downtime could be critical. With the correct spares in stock Tannoy monitors can be serviced in less time than a typical coffee break.

A list of recommended spare parts is shown in Section 8 of this manual as first and second level spares.

Listening Position

Duty Rating and On-Site Servicing

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If this mode is chosen then it is absolutely essential that the power amplifiers are all of exactly the same specification. Although the HF section of the loudspeaker need more power energy at the LF section, it needs just as much voltage energy to deliver its dynamic range. Additionally it is essential that the phase relationships across the audio band are preserved and therefore if bi-amp driving is chosen, identical power amplifiers are required.

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A list of recommended spare parts is shown in Section 8 of this manual as first and second level spares.

Listening Position

Duty Rating and On-Site Servicing

sections are completely separated from each other.

If this mode is chosen then it is absolutely essential that the power amplifiers are all of exactly the same specification. Although the HF section of the loudspeaker need more power energy at the LF section, it needs just as much voltage energy to deliver its dynamic range. Additionally it is essential that the phase relationships across the audio band are preserved and therefore if bi-amp driving is chosen, identical power amplifiers are required.

The power output performance of the Tannoy Monitor is directly related to the power amplifier output. The conversion of electrical power from the source to sound energy is proportional to the sensitivity specification of the Monitor. Please read the full technical specification for details.

In low levels in dynamic range, an amplifier of no less than 150 watt per channel should be used on Systems 6, 8 and 10 and 300 watt per channel for Systems 12, 15 and 215.

Locate the monitor so that the listening position at the console is approximately 10-15 degrees from the axis of the Dual Concentric drive unit. This will give the optimum spread of TIF information.

The distance between the two speakers should be between 2 to 4 inches, depending on control room size. Where possible avoid mounting the speakers close to walls, floors or ceilings. The distance between the monitoring position and each speaker should be slightly greater than the distance between the speakers.

Please note if the speakers are placed too close to each other the full stereo image may not develop, on the other hand if you place them too far apart you will notice an audience hole in the middle of the stereo image.

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Listening Position

Duty Rating or Servicing

high frequency magnetic air gaps. This gives a very compact drive unit with acoustic source alignment. In the new design of Dual Concentric units the HF unit and LF unit now have separate, dedicated magnet systems. This is because the HF waveguide design has become so sophisticated it cannot be made by processes suitable for magnetic flux carrying materials.

The LF waveguide can therefore no longer be an integral part of the LF magnet system. In splitting the magnet system into two degrees of design freedom allows for very high precision casting and moulding processes together with accurate soft coating diaphragm assemblies. Both production, processing and artificial parts can then guarantee consistent performance.

A new design of waveguide has been arrived at by making extensive use of CAD (computer aided design). We call it a waveguide because there is a direct analogy with electromagnetic radiation in that characteristic impedances must be carefully matched without introducing standing waves. The Tannoy HF waveguide matches the acoustic source impedance at the HF diaphragm into the listening environment.

The waveguide shapes the waveform as it travels down from the diaphragm causing that path lengths are equal, that the waveform is perpendicular to the fixed surface and that the waveform is spherical. Only small errors of fractions of a millimetre can upset this condition and cause phase shifts in the waveform. Accuracy of design and production are essential to achieving the correct conditions within the waveguide.

In this way transverse modes are minimised and high frequency dispersion minimised. Waveform shaping begins at the diaphragm surface and, because the compression ratio can be kept relatively low with this design, the distortion due to air non-linearities are minimised. A hyperbolic flare has been chosen for optimum low frequency performance at the crossover point.

The HF diaphragm is a new design. The waveguide requires rigid piston movement over the operating range since any breakup mode within the diaphragm will result in phase shifted components at the start of the waveguide propagation. A rigid piston diaphragm operating at above 25 kHz is made from aluminium and magnesium alloy.

A special machine has been designed and built to form and extract the diaphragm with a 2 mm slot. This configuration gives the most rigid diaphragm and ensures reliable handling for production and field servicing.

Aluminium is notoriously difficult for adhesive working and we run the diaphragm through a special adhesive extruding process followed immediately by the build process to ensure reliability.

The diaphragm assembly is suspended by a precision moulded, inert nitile rubber surround. This has been designed and tested using high precision, numerically controlled machining techniques. Its very narrow roll eliminates

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High Frequency Drive Unit

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high-current current source crossover

The shape and materials from which the cone pivots are made reflect the optimization of drive unit to cabinet size and end use. Systems 6, 8, 10 and 12 LF units use a CNC precision injection moulded polypropylene cone. Systems 15 and 215 have a traditional pulp cone with apex treatment and air-dry finishing process. For cones of this size there is no better alternative when mass, rigidity, pivot movement and natural upper roll-off characteristics are considered.

All LF drivers have their cones terminated by nitrile rubber, high-compliance surround. The compliance of the cone and impedance is matched by the surround material independently of the required suspension compliance. The unit system compliance is provided by the rear suspension where the best degree of mechanical control can be provided.

In all cases the shape of the LF cone has been calculated to match the HF hyperbolic waveguide causing the wavefront remain spherical and perpendicular to the cone surface throughout the propagation.

Brand new pressure driver units have been modelled for the new range drawing extensively on new thinking for LF driver units. It is important to eliminate trade-offs as these can lead to performance loss. In this instance, apert the standard Q driver requirements and cause unwanted acoustic interactions because of Helmholtz resonances and reflections from the chassis surface, smearing the energy/time response.

The new chassis have a very open construction with vented rear suspension features to eliminate low Q cavities, improve thermal cooling and prevent major reflections. Rigidity has been optimised in the axial plane to complement the cabinet philosophy (see later) while the front surface profile has been designed to prevent diffraction at the cabinet surface.

The first series of chassis each have purpose-designed minirings to bleed the HF wavefront into the cabinet. This feature has been shown in our research to be the biggest single factor in providing smooth HF radiation in Dual Concentric (assuming, of course, that the HF unit is well designed in the first instance).

There are two philosophies in designing loudspeaker crossover networks; the minimalist and the conjugate. The minimalist approach requires that the drive units are inherently well behaved and that each series, LF and HF, require minimum equalisation to achieve a smooth flat amplitude response. The conjugate approach requires that the drive units are accepted as they are but are well characterised. The crossover network is then calculated to provide inherent equalisation to ensure a smooth amplitude response.

The two approaches differ in design emphasis. The minimalist designer concentrates on the drive unit design in controlling the final performance, while the conjugate designer concentrates on complex electronic analysis of networks to achieve the same measured result.

Tannoy has always followed the minimalist philosophy as far as possible. This is because listening trials with loudspeakers always point to those with the least

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Crossover Network

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er networks it is vital to use the very highest quality air core inductor elements. Resin impregnated, air core inductors and custom components are employed for best sound quality. DMT research showed that a capacitor was encapsulated in a vibration absorbing material if changed from ceramic to dynamic. Every variable of capacitor construction was investigated and custom capacitors designed optimised for sonic performance with high-purity copper leads.

Vibrations inside the cabinet can effect the performance of inductor coils. Tests show that reducing the vibrations reaching the inductors can have a marked effect on system bass end resolution. Coils vacuum impregnated with resin to reduce the effects of vibration.

Vibration has an effect on sound quality and in the Tannoy Monitor series custom manufactured woven wire is used to reduce induced signals for a cleaner high frequency performance.

Inductors radiate a significant magnetic field which affects nearby components. Similarly inductors can be affected by a driver's magnetic radiation. For these reasons it was decided to produce a split crossover with the inductor mounted on the cabinet brace away from the driver magnets and other crossover components. The sound quality improvements more than justify additional manufacturing costs.

The crossover in the new series uses single low order slopes (6 dB and 12 dB per octaves) to control the power distribution and balance. The components are of very high quality with Hard-Wiring (no printed circuit boards) and mounted on the back of the terminal panel at the rear of the cabinet. All components are easily serviceable in the field by removing the terminal panel from the outside of the cabinet. There is no need to remove drive units or access.

The terminal panel is a new design especially suited for the new series. The option of conventional wiring or Bi-Wiring is available by a unique high quality sliding mechanism with large diameter robust terminals. The Bi-Wiring for monitoring are easily found where the extra pair of cables are accommodated.

The terminal panel on System 12, 15 and 215 also includes a sliding link which provides adjustment of the high frequencies on a shelving basis from 2 kHz with 1.5 dB plus or minus 1.5 dB adjustment. The controls are calibrated in position to be flat to within +/- 1dB when set to the flat adjustment position. All terminals and controls are gold plated to eliminate contact potentials and oxidation. The terminal panel carries the crossover mounting and can be removed from the outside of the cabinet.

The cabinet provides perhaps the greatest departure from convention yet seen in the professional marketplace. There are three major philosophies to the

design of drive units due to the majority of the aberrations in the loudspeaker system are due to the cabinet. Most of the irregularities heard and

In crossover networks it is vital to use the very highest quality air core inductor elements. Resin impregnated, air core inductors and custom DMT capacitors are employed for best sound quality. DMT research showed that when a capacitor was encapsulated in a vibration absorbing material it changed both the sound texture and dynamics. Every variable of capacitor construction was investigated and custom capacitors designed optimised for sonic performance with high-purity copper leads.

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Terminal Panel



Cabinet



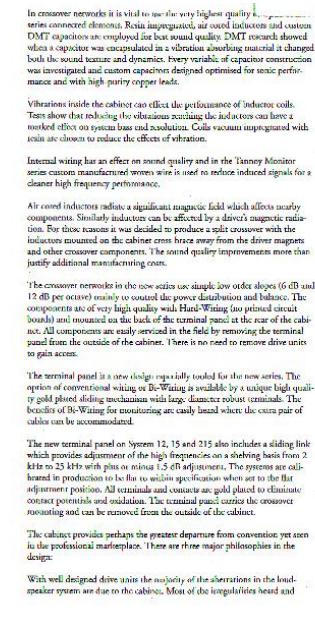
Terminal Panel



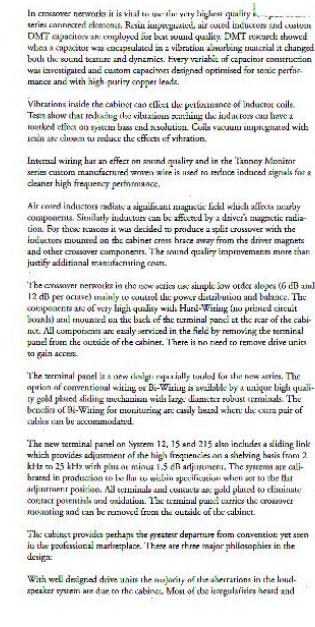
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It would be reasonable therefore that the driver unit must be held in space very rigidly so that the LF diaphragm displacements are not diminished modified by the HF diaphragm which have inherently much more energy associated with them. The obvious method of doing this is to mount the drive unit rigidly into a rigidly made cabinet. But in doing this, a new set of problems appears.

Rigid systems are characterized by high stiffness. The natural resonance of the high cabinet stiffness—achieved by, say, cross bracing and bracing the driver to the rear of the cabinet, and drive unit mass, brings the natural resonance frequency into the mid band, typically around 100 to 200 Hz. This produces an objectionable coloration which can be mitigated in small terms by some柔軟性 by the increase in "speed" and HF clarity provided by the rigid system. However, it is not an ideal solution.

In its new Monitor-Triang system has taken a radical approach, preferred to by massed parameter research into cabinet systems coupled with listening tests. The Tannoy cabinets are stiff but with a high level of internal damping. A very complex internal bracing structure in each of the cabinets allows the drive unit to be held rigidly but also to be able to damp its resonant or reactive energy into the lower couplings of the cabinet. The joints between the driver and the bracing structure have a special compound which is very stiff at high frequencies but will absorb energy in the critical coloration area.

The cabinet panels are made from MDF but are laminated on each side to increase their stiffness. However, the layer of adhesive between MDF and laminate acts as a lossy energy absorber/muffler.

The cabinet panels are coupled into each other through hardwood rails at the corners, the dissipative materials providing further modification for any inherent reactive energy components in the cabinet caused by the drive unit.

The rigid construction structure is located inside the cabinet using an adhesive system which will absorb the redundant energy from the rear of the drive unit chassis and magnet system and yet provide the stiffness needed to allow very fine HF resolutions from the HF unit diaphragm.

In addition to the cabinet construction the volume and port tuning have been carefully calculated to give the best set of parameters for monitoring loudspeakers.

There is a fundamental relationship in loudspeakers between efficiency, cabinet volume and low frequency performance given that minimal amplitude variations can be tolerated (as in monitoring situations). The set of parameters that are arrived at as a solution are inevitably a compromise and the skill of Tannoy has always been shown to be getting these particular parameters correct for the application.

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application of the Differential Material Technology approach to component behaviour under vibration and magnetic fields has lead to custom crossover components, custom cabling and a split crossover design being employed.

The result of all these innovations is a family of monitoring loudspeakers from Tannoy speakers which are quite remarkable in resolving the finest detail over the whole audio spectrum.

Monitor Series loudspeakers prove that Tannoy still leads the world in applying the science of loudspeaker design to the practical monitoring situation. These monitors are tools to be used in producing even more artistic and satisfying developments within the live and recorded sound stage.

The thin rings around the rubber surrounds are there to smooth out the otherwise discontinuous contour to the HF waveform.

The smooth lines around the port tubes ensure laminar air flow at low frequencies where the air in the ports has maximum velocity.

The slopes of the LF cones continue the hyperbolic waveguide for the HF energy propagation.

The cabinet bracing and internal construction ensures that the HF unit can deliver the detail into the sound field.

The application of the Differential Material Technology approach to component behaviour under vibration and magnetic fields has lead to custom crossover components, custom cabling and a split crossover design being employed.

The result of all these innovations is a family of monitoring loudspeakers from Tannoy speakers which are quite remarkable in resolving the finest detail over the whole audio spectrum.

The new Monitor Series loudspeakers prove that Tannoy still leads the world in applying the science of loudspeaker design to the practical monitoring situation. These monitors are tools to be used in producing even more artistic and satisfying developments within the live and recorded sound stage.

The thin rings around the rubber surrounds are there to smooth out the otherwise discontinuous contour to the HF waveform.

The smooth lines around the port tubes ensure laminar air flow at low frequencies where the air in the ports has maximum velocity.

The slopes of the LF cones continue the hyperbolic waveguide for the HF energy propagation.

The cabinet bracing and internal construction ensures that the HF unit can deliver the detail into the sound field.

The application of the Differential Material Technology approach to component behaviour under vibration and magnetic fields has lead to custom crossover components, custom cabling and a split crossover design being employed.

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cleaner. The surface will change colour when wet but will return to normal when dry.

For touch-up of paint chips contact your local Tannoy Service Agent for materials and guidance.

The grille cloth may be brushed to remove dust and particles and may be washed in warm soapy water if necessary. Do not soak the grille frame or dry under artificial heat or the grille may twist out of shape.

The grille is held by plastic split dowels located in the grille frame which fit into rubber lined holes in the front panel. To remove the grille pull any corner until the grille frame can be eased away evenly. Do not pull sharply from only one corner as there is a risk of the grille being twisted out of shape.

Lay the cabinet on its back taking care to protect the terminals and the rear surface. Remove the four hexagonal socket headed bolts and set aside. Have the driver from the front of the cabinet taking care not to mark the frame surface. Use a piece of stout cardstock to lever against if necessary. The driver will yield to some pressure and the sprung mass damping compound between the magnet and the internal cabinet housing releases. Remove the driver, note the polarity of the internal connections and disconnect the internal wiring.

Please note not to damage the moving parts of the LF driver.

To refit the Dual Concentric driver, connect the cables from the crossover to the LF and HF terminals. Locate the piece of damping material which was pressed between the rear of the HF magnet and the cabinet crossbrace during manufacture. Roll it into a ball and press it onto the centre of the cabinet crossover.

Fit the driver into the mounting hole and maintain pressure on the front of the chassis until the driver seats into the compound. Please note that the internal driver assembly must not be tilted at any angle other than the cabinet crossover. Turn the bolt finger tight and then progressively torque them down so that the driver seats evenly into the damping compound. Check the tightness of the mounting screws before fitting the grille.

The crossover network is mounted on the rear of the terminal panel. To inspect it, remove the panel by releasing the horizontal screws. Take care not to take place up to the limit of the length of the internal wiring. Take care to avoid undulations on the cables and components. When replacing components make sure they have the same physical orientation as the original.

To remove the crossover completely the cables must be disconnected from the drive unit. Please proceed as above to remove the drive unit.

The HF unit may be fitted with a new diaphragm assembly or replaced as a complete assembly for speed. In either case with the driver face-down, release the three bolts securing the HF assembly and lift the HF unit vertically upwards and away from magnetic attraction caused by the LF magnet. Replace the diaphragm—if it is self-centering—or the complete unit, taking care to align the parts correctly.

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The grille cloth may be brushed to remove dust and particles and may be washed in warm soapy water if necessary. Do not soak the grille frame or dry under artificial heat or the grille may twist out of shape.

The grille is held by plastic split dowels located in the grille frame which fit into rubber lined holes in the front panel. To remove the grille pull any corner until the grille frame can be eased away evenly. Do not pull sharply from only one corner as there is a risk of the grille being twisted out of shape.

Lay the cabinet on its back taking care to protect the terminals and the rear surface. Remove the four hexagonal socket headed bolts and set aside. Pull the driver from the front of the cabinet taking care not to mark the frame surface. Use a piece of stout cardstock to lever against if necessary. The driver will yield to some pressure and the sprung mass damping compound between the magnet and the internal cabinet housing releases. Remove the driver note the polarity of the internal connections and disconnect the internal wiring.

Please note not to damage the moving parts of the LF driver.

To refit the Dual Concentric driver, connect the cables from the crossover to the LF and HF terminals. Locate the piece of damping material which was pressed between the rear of the HF magnet and the cabinet crossbrace during manufacture. Roll it into a ball and press it onto the centre of the cabinet crossover.

Fit the driver into the mounting hole and maintain pressure on the front of the chassis until the driver seats into the compound. Please note that the internal driver assembly must not be tilted at any angle other than the cabinet crossover. Turn the bolt finger tight and then progressively torque them down so that the driver seats evenly into the damping compound. Check the tightness of the mounting screws before fitting the grille.

The crossover network is mounted on the rear of the terminal panel. To inspect it, remove the panel by releasing the horizontal screws. Take care not to take place up to the limit of the length of the internal wiring. Take care to avoid undulations on the cables and components. When replacing components make sure they have the same physical orientation as the original.

To remove the crossover completely the cables must be disconnected from the drive unit. Please proceed as above to remove the drive unit.

The HF unit may be fitted with a new diaphragm assembly or replaced as a complete assembly for speed. In either case with the driver face-down, release the three bolts securing the HF assembly and lift the HF unit vertically upwards and away from magnetic attraction caused by the LF magnet. Replace the diaphragm—if it is self-centering—or the complete unit, taking care to align the parts correctly.

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The grille cloth may be brushed to remove dust and particles and may be washed in warm soapy water if necessary. Do not soak the grille frame or dry under artificial heat or the grille may twist out of shape.

The grille is held by plastic split dowels located in the grille frame which fit into rubber lined holes in the front panel. To remove the grille pull any corner until the grille frame can be eased away evenly. Do not pull sharply from only one corner as there is a risk of the grille being twisted out of shape.

Lay the cabinet on its back taking care to protect the terminals and the rear surface. Remove the four hexagonal socket headed bolts and set aside. Pull the driver from the front of the cabinet taking care not to mark the frame surface. Use a piece of stout cardstock to lever against if necessary. The driver will yield to some pressure and the sprung mass damping compound between the magnet and the internal cabinet housing releases. Remove the driver note the polarity of the internal connections and disconnect the internal wiring.

Please note not to damage the moving parts of the LF driver.

To refit the Dual Concentric driver, connect the cables from the crossover to the LF and HF terminals. Locate the piece of damping material which was pressed between the rear of the HF magnet and the cabinet crossbrace during manufacture. Roll it into a ball and press it onto the centre of the cabinet crossover.

Fit the driver into the mounting hole and maintain pressure on the front of the chassis until the driver seats into the compound. Please note that the internal driver assembly must not be tilted at any angle other than the cabinet crossover. Turn the bolt finger tight and then progressively torque them down so that the driver seats evenly into the damping compound. Check the tightness of the mounting screws before fitting the grille.

The crossover network is mounted on the rear of the terminal panel. To inspect it, remove the panel by releasing the horizontal screws. Take care not to take place up to the limit of the length of the internal wiring. Take care to avoid undulations on the cables and components. When replacing components make sure they have the same physical orientation as the original.

To remove the crossover completely the cables must be disconnected from the drive unit. Please proceed as above to remove the drive unit.

The HF unit may be fitted with a new diaphragm assembly or replaced as a complete assembly for speed. In either case with the driver face-down, release the three bolts securing the HF assembly and lift the HF unit vertically upwards and away from magnetic attraction caused by the LF magnet. Replace the diaphragm—if it is self-centering—or the complete unit, taking care to align the parts correctly.

not appear parallel.

It may be re-coated in the normal way. Ease the trim ring from the round and remember to refit it. The trim ring forms an integral part of the HF dispersion system. Use only the parts and adhesive supplied in the re-coat kit.

Both LF and HF units may be checked for buzz and rattle individually. Set the tone control panel to B-Wire (see earlier for details). Using a very high quality oscillator (preferably a Low Frequency Oscillator) and power amplifier set the output of the amplifier to give 3 volts rms at 1 kHz. Feed this signal in turn to the LF and HF terminal pins. The speakers should be free from buzz and rattle.

To check for high level problems 10 volts rms is permissible to the LF unit above 70 Hz and 5 volts rms to the HF unit. Higher levels must be used with caution as the thermal rating of the drive units can be exceeded under test situations. Audible buzz and rattle problems can usually be heard with the 3 volt signals.

Sweep Signal Testing

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Sweep Signal T

DISTORTION	Less than 0.75% 52 Hz – 25 kHz
PHASE RESPONSE	System behaves inherently as a frequency-independent time delay
DISPERSION	90 degrees axial
CROSSOVER FREQUENCY	2 kHz
CROSSOVER TYPE	In order 12, 1st order HP High-Wind, low loss, passive acoustic polarity
FREQUENCY RESPONSE (±0 dB)	52 Hz – 25 kHz
DRIVE UNIT TYPE	6.5 inch 160W Dual Concentric

10 liters
MDF front baffle, 10 mm black textured powder coated metal grille, 10 mm black textured powder coated metal cabinet frame.

DISTORTION	Less than 0.75% 52 Hz – 25 kHz
PHASE RESPONSE	System behaves inherently as a frequency-independent time delay
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DISTORTION	Less than 0.75% 52 Hz – 25 kHz
PHASE RESPONSE	System behaves inherently as a frequency-independent time delay
DISPERSION	90 degrees axial
CROSSOVER FREQUENCY	2 kHz
CROSSOVER TYPE	2nd order 12, 1st order HP High-Wind, low loss, passive acoustic polarity
FREQUENCY RESPONSE (±0 dB)	52 Hz – 25 kHz
DRIVE UNIT TYPE	6.5 inch 160W Dual Concentric

10 liters
MDF front baffle, 10 mm black textured powder coated metal grille, 10 mm black textured powder coated metal cabinet frame.

System 8 NFM II

RECOMMENDED AMPLIFIER POWER	20 to 150 watt RMS
PEAK POWER HANDLING	200 watt
NO NORMAL IMPEDANCE	4 ohm
Sensitivity (2.86v rms @ 1 m)	99.48
DISTORTION	Less than 0.4% 47 Hz – 25 kHz
PHASE RESPONSE	System behaves inherently as a frequency-independent time delay
DISPERSION	90 degrees axial
CROSSOVER FREQUENCY	2 kHz
CROSSOVER TYPE	In order 12, cascaded 1st order HP with impedance compensation, passive acoustic polarity
FREQUENCY RESPONSE (±0 dB)	47 Hz – 25 kHz
DRIVE UNIT TYPE	8 inch 160W Dual Concentric

18.1 liters
MDF front baffle, 10 mm black textured powder coated metal grille, 10 mm black textured powder coated metal cabinet frame.

RECOMMENDED AMPLIFIER POWER	10 to 150 watt RMS
PEAK POWER HANDLING	200 watt
NO NORMAL IMPEDANCE	4 ohm
Sensitivity (2.86v rms @ 1 m)	99.48
DISTORTION	Less than 0.4% 47 Hz – 25 kHz
PHASE RESPONSE	System behaves inherently as a frequency-independent time delay
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FREQUENCY RESPONSE (±0 dB)	47 Hz – 25 kHz
DRIVE UNIT TYPE	8 inch 160W Dual Concentric

18.1 liters
MDF front baffle, 10 mm black textured powder coated metal grille, 10 mm black textured powder coated metal cabinet frame.

RECOMMENDED AMPLIFIER POWER	20 to 150 watt RMS
PEAK POWER (AMBIENT 20°C)	200 watt
NOMINAL IMPEDANCE	4 ohm
Sensitivity (2.86v rms @ 1 m)	99.48
DISTORTION	Less than 0.4% 47 Hz – 25 kHz
PHASE RESPONSE	System behaves inherently as a frequency-independent time delay
DISPERSION	90 degrees axial
CROSSOVER FREQUENCY	2 kHz
CROSSOVER TYPE	2nd order 12, 1st order HP High-Wind, low loss, passive acoustic polarity
FREQUENCY RESPONSE (±0 dB)	47 Hz – 25 kHz
DRIVE UNIT TYPE	8 inch 160W Dual Concentric

18.1 liters
MDF front baffle, 10 mm black textured powder coated metal grille, 10 mm black textured powder coated metal cabinet frame.

System 8 NFM II

CABINET SPECIFICATIONS	
CABINET INTERNAL VOLUME	18.1 liters
CABINET MATERIAL	MDF front baffle, 10 mm black textured powder coated metal grille, 10 mm black textured powder coated metal cabinet frame.
CABINET FINISH	White paint, black acoustically transparent material over a rigid frame.
GRELS	Single piece, black acoustically transparent material over a rigid frame.
CABINET DIMENSIONS (HxWxD)	600 x 350 x 230 mm (11.8 x 13.8 x 9.1 in)
CABINET WEIGHT	12 kg (26.4 lb)
SHIPPING DIMENSIONS (HxWxD)	Approximately 510 x 350 x 260 mm (19.8 x 13.8 x 10.2 in)
SHIPPING WEIGHT	Approximately 16 kg (35.2 lb)

CABINET SPECIFICATIONS	
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SHIPPING WEIGHT	Approximately 16 kg (35.2 lb)

18.1 liters
MDF front baffle, 10 mm black textured powder coated metal grille, 10 mm black textured powder coated metal cabinet frame.

CONSE	Less than 0.65 g/cm ³ to 2.5 g/cm ³
TERMINALS	System failure inherently as a design-independent test criteria
DETECTION	50 ohms nominal
TYPE	1.5 kΩ
RESPONSE (at 40 °C)	For more information, see ESD Testable acoustic package
TYPE	0 dB, -10 dB
TEST	30-ohm DUT Dual Ground
INDICATIONS	
TERMINAL VOLUME	25 litre
FUNCTION	MTBF 20 years based on 20.6 mm single board and single board range showing breaking stress and TTS assume working
TEST	With detector probe set to zero (idle), high pressure waveform with a 100% duty cycle results in speech-like noise at any frequency from 100 Hz to 10 kHz.
RESPONSE (at 40 °C)	Single piece, block assembly component tested on a rigid frame
MATERIALS (at 40 °C)	500 x 300 x 200 mm (20.0 x 11.8 x 7.9 inch)
RIGHT	19 kg (41.9 lb)
MATERIALS (at 40 °C)	Approximately 600 x 307 x 300 mm (23.6 x 12.0 x 11.8 inch)
RIGHT	Approximately 21 kg (46.3 lb)
SYSTEM AMPLIFIER POWER	
TERMINAL VOLUME	50 to 300 mm³ (3.04)
FUNCTION	150 watt
TEST	500 mA
RESPONSE (at 40 °C)	100 dB
TYPE	100% sine, 0.50–0.10 Hz, 25 kHz
DETECTION	System failure inherently as a frequency independent test criteria
INDICATIONS	50 ohms nominal
DETECTION	1.4 kΩ
TYPE	2nd order resonance LF. For code ESD, failure acoustic package
FUNCTION	Testing range: 0.150–20 kHz (resonant) ± 1.5 dB. Level: -10 dB
RESPONSE (at 40 °C)	40 dB → -20 dB
TYPE	12 volt (96 dB) or Durable
ECIFICATIONS	
TERMINAL VOLUME	0 litre
FUNCTION	100% sine, quasi-random and logic 0.50–0.10 Hz, 25 kHz with a sweep showing breaking stress and TTS assume working
TEST	With detector probe set to zero (idle), high pressure waveform with a 100% duty cycle results in speech-like noise at any frequency from 100 Hz to 10 kHz.
RESPONSE (at 40 °C)	Single piece, block assembly component tested on a rigid frame
MATERIALS (at 40 °C)	545 x 422 x 295 mm (21.5 x 16.5 x 11.5 inch)
RIGHT	32 kg (70.5 lb)
MATERIALS (at 40 °C)	Approximately 750 x 395 x 305 mm (29.5 x 15.5 x 11.8 inch)
RIGHT	Approximately 27 kg (60.6 lb)

Systematic Review

System 12 DMT II	System 12 DMT
DISTORTION	Less than 0.05% (AFC = 10 Hz)
TRANS. BIAS/ON-SITE	Speaker behavior is basically as frequency independent (see diag.)
DISPERSION	90 degrees (ideal)
CROSSOVER FREQUENCY	14 kHz
CROSSOVER TYPE	2nd order numberpi (L) or 1st order HF Pole (series pole)
PHASING RESPONSE (±0 dB)	45 Hz – 25 kHz
DRIVE UNIT (TYPE)	10-inch 200W Dual Concentric
CABINET SPECIFICATIONS	
CABINET INTERNAL VOLUME	91 liters
CABINET MATERIAL	MDF 18 mm. Front/back: 32 mm (top/bottom and sides) 18 mm. Edge: 18 mm. Back: 18 mm. Top/bottom and sides: 18 mm. Edge: 18 mm.
CABINET FINISHES	Walnute and silver varnish finish. Full gamma finish. Lacquer and clear lacquer. Special finishes by request.
GARIBI	Front panel: Black anodized aluminum with light grey stripes.
CABINET DIMENSIONS (W/H/D)	610 x 360 x 300 mm (22.4 x 14.1 x 11.8 inch)
CABINET WEIGHT	11 kg (24.3 lb)
SHIPPING DIMENSIONS (W/H/D)	Approximately 682 x 485 x 390 mm (27.0 x 19.1 x 15.3 inch)
SHIPPING WEIGHT	Approximately 12 kg (46.3 lb)
RECOMMENDED AMPLIFIER POWER	90 to 300 watt
PEAK POWER HANDLING	450 watt
SIGNAL-TO-NOISE RATIO	80 dB
SENSITIVITY (2V RMS) (1 m)	95 dB
DISTORTION	Less than 0.05% (AFC = 10 Hz)
TIME RESPONSE	Speaker behavior is basically as frequency independent (see diag.)
DISPERSION	90 degrees (ideal)
CROSSOVER FREQUENCY	14 kHz
CROSSOVER TYPE	2nd order numberpi (L) or 1st order HF Pole (series pole)
CROSSOVER CONTROLS	Hole frequency range 20 Hz – 20 kHz (stepless) → 1.5 dB, level 1.5 dB
PHASING RESPONSE (±0 dB)	45 Hz – 25 kHz
DRIVE UNIT (TYPE)	12 inch 300W Dual Concentric
CABINET SPECIFICATIONS	
CABINET INTERNAL VOLUME	78 liters
CABINET MATERIAL	MDF 18 mm. Front/back: 32 mm (top/bottom and sides) 18 mm. Edge: 18 mm. Back: 18 mm. Top/bottom and sides: 18 mm. Edge: 18 mm.
CABINET FINISHES	Walnute and silver varnish finish. Full gamma finish. Lacquer and clear lacquer. Special finishes by request.
GARIBI	Front panel: Black anodized aluminum with light grey stripes.
CABINET DIMENSIONS (W/H/D)	610 x 420 x 300 mm (22.4 x 16.5 x 11.8 inch)
CABINET WEIGHT	32 kg (70.5 lb)
SHIPPING DIMENSIONS (W/H/D)	Approximately 740 x 510 x 400 mm (29.5 x 20.5 x 15.7 inch)
SHIPPING WEIGHT	Approximately 35 kg (77.1 lb)

PHASE RESPONSE	Speaker becomes inaudible as frequency independent due to dispersion.
DISPERSION	90 degrees initial
CROSSOVER FREQUENCY	1.3 kHz
CROSSOVER TYPE	2nd order extended LF, 1st order HF Passive acoustic polarizer
CROSSOVER CONTROLS	Volume range 2.0 dB - 25.0 dB (bending) → +1.5 dB, Level, 1.5 dB
FREQUENCY RESPONSE (±3 dB)	35 Hz - 25 kHz
DRIVE UNIT TYPE	15 inch JBL® Dual Concentric

CABINET SPECIFICATIONS	
CABINET INTERNAL VOLUME	100 liter
CABINET MATERIAL	MDF 15 mm, front and back 70.0 mm, top, bottom and sides, grey polyurethane coating and 1% acoustic varnish
CABINET FINISH	White, black or grey with acrylic special finish on top, bottom and sides
GRILL	Singl piece, black acoustically transparent material on wood

CABINET DIMENSIONS (W/H/D) 940 x 390 x 440 mm (37.0 x 15.4 x 17.3 inch)

CABINET WEIGHT 6.1 kg

SHIPPING DIMENSIONS (W/H/D) Approximately 940 x 410 x 440 mm (37.0 x 16.1 x 17.3 inch)

SHIPPING WEIGHT Approximately 10 kg (10.2 lb)

RECOMMENDED AMPLIFIER POWER 150 to 500 watt RMS

PEAK POWER HANDLING 750 watt

NOMINAL IMPEDANCE 4 ohm

SENSITIVITY (2.83 mV @ 1 m) 103 dB

DISTORTION Less than 0.5% 25 Hz - 25 kHz

PHASE RESPONSE Speaker becomes inaudible as frequency independent due to dispersion.

DISPERSION 90 degrees initial

CROSSOVER FREQUENCY 250 Hz and 1.3 kHz

CROSSOVER TYPE 2nd order extended LF, 1st order HF Passive acoustic polarizer

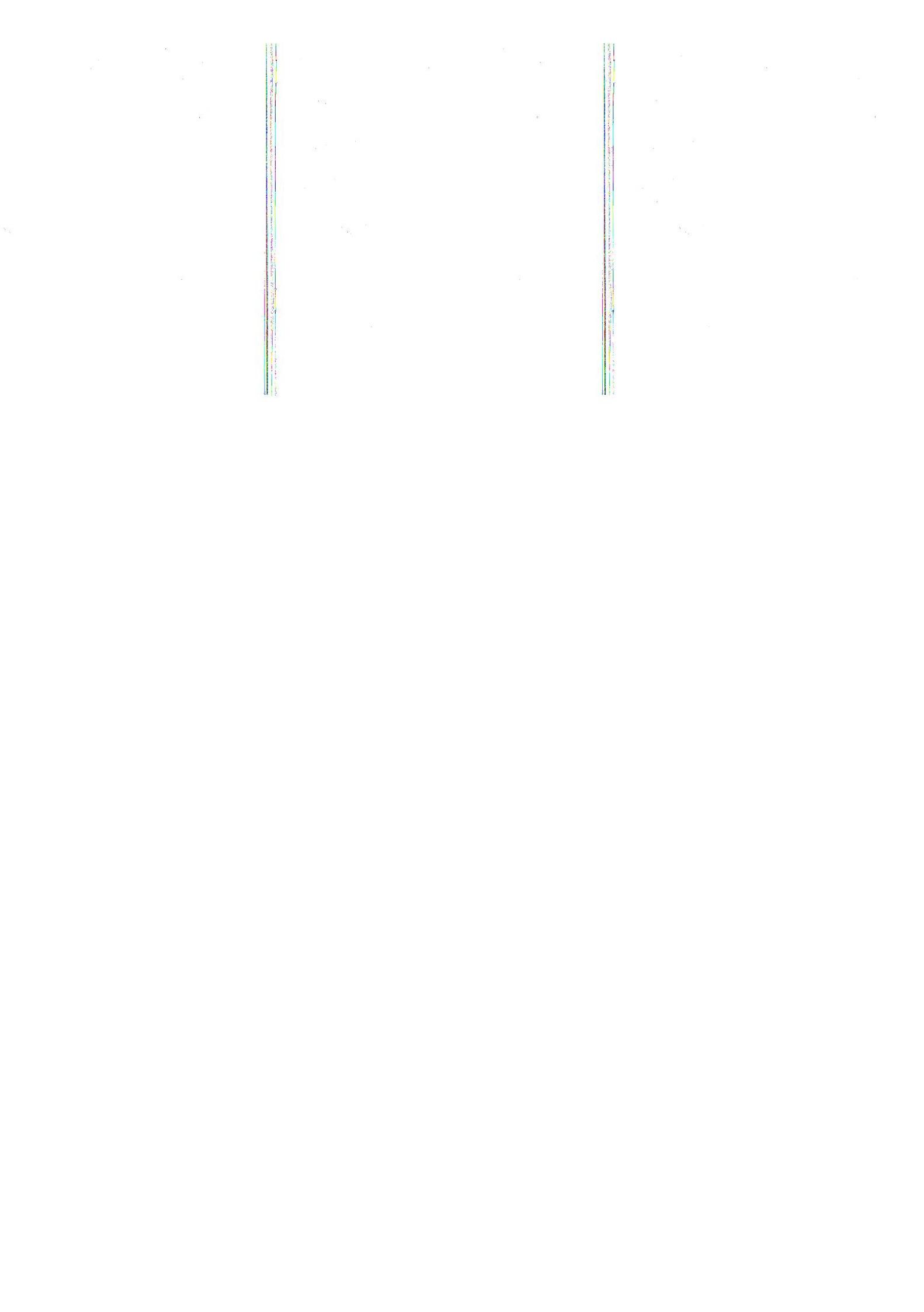
CROSSOVER CONTROLS Volume range 2.0 dB - 25.0 dB (bending) → +1.5 dB, Level, 1.5 dB

LOW FREQUENCY WINDOW Low frequency window

FREQUENCY RESPONSE (±3 dB) 35 Hz - 25 kHz

DRIVE UNIT TYPE 15 inch JBL® Dual Concentric

15 inch



System 6 NFM II

System 6 NFM II

System 10 DMT

System 10 DMT II

System 10 DMT

System 10 DMT II

Review: IGR 1700 10% WW
Review: I-100 1700 10% WW
Capacitor 10 μF 100V polypropylene
Capacitor 10 μF 100V

System 10 DM

System 10 DMT

hand

System 215 DMT II left-hand

hand

System 215 DMT II left-hand

hand

System 215 DN
hand

System 215 DMT II right
hand

This guarantee is given against a period of five years from the date of delivery, subject to the absence of, or evidence of, misuse, overload or accidental damage.

For further information please contact your dealer or the distributor in your country. If you cannot locate your distributor please contact:

Customer Services
Tannoy Ltd
Rowhill Industrial Estate
Coatbridge, Scotland
ML3 4TF, Scotland.

Telephone (0236) 420199
Fax (0236) 428230.

DO NOT SHIP ANY PRODUCT TO TANNOY WITHOUT PREVIOUS AUTHORITY.

This warranty in no way affects your statutory rights.

Our policy commits us to incorporating improvements to our products through continuous research and development. Please confirm current specifications for critical applications with your supplier.

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Logo and design by The Bookmark Print Studio

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INNOV.

Tannoy Loudspeakers are manufactured in Great Britain by:

Tanney Limited
Rosehill Industrial Estate
Craibridge, Strathclyde
ML5 4TF Scotland

Telephone (01236) 420199
Fax (01236) 428230

Tanbooy is a member of the TGI plc

TANNOY

Tannoy Loudspeakers are manufactured in Great Britain by:

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