In the case of so many Wilson Benesch products not only are the organic forms a clear manifestation of this philosophy but of course, being carbon based, the links between the materials employed in the construction of both the invention and Man are clear. Materials technology is one aspect of the innovation that has been brought to the domestic audio market by Wilson Benesch. In a brief time the company has established itself throughout the world and can be proud of its achievements.

We would like to thank you for sharing our view on what represents good design by choosing our product above all others. We are confident that you will enjoy them as much as we do.
Type:
Floor standing. Infinite baffle on both low frequency and discrete mid range system.

Range:
Full frequency: 25 Hz to 20 kHz
± 2.5 dB 40 Hz to 20 kHz

Impedance loading:
6 Ohms nominal, 4 Ohm minimum 20 Hz to 20 kHz

Sensitivity:
87 dB @1m, 2.83V input

Crossover:
Minimum phase, short signal path. Air core inductors, selected polypropylene capacitors.

Low frequency driver array:
- Isobaric Tactic® System:
  Eight Wilson Benesch Tactic® Drive units are used in a clamshell Isobaric configuration. The Tactic® drive unit has been developed in order to fulfill a multi role function to achieve maximum integration. It represents the State of The Art in driver technology.
  Benefits.
  NdFeB rare earth axially magnetised super low profile gas flowed motor system.
  High linearity 170 mm driver; 38 mm high temperature voice coil. The world’s first Isotactic polypropylene with convex / concave diaphragm.
  Aluminium alloy gas flowed low reflection basket. Machined from a solid billet.
- Mid range Tactic® driver:
  Wilson Benesch Tactic® Drive unit. The Tactic® drive was developed as a multi role unit. Integration is axiomatic. The mid range Tactic® driver features the same high quality, innovative drive motor used in the Isobaric Tactic®.
- Treble driver:
  Wide bandwidth, chamber loaded 25 mm woven silk dome, Super Revelator.

Internal wiring:
Teflon sleeve low loss silver plated high purity copper wire used throughout the speaker.

Power handling:
Maximum level: 112 dB at 1 metre
200 W peak programme

Input:
Tri-wire gold plated Wilson Benesch 4 mm socket/binding posts. Spanner provided for gold plated nuts.

Size:
Height:1610 mm
Width:230 mm
Depth:560 mm
Weight: 90 kg
Internal volume: 75 litres

All Wilson Benesch products are subject to continuous improvement. Because superior technology brings improvements in performance we reserve the right to make changes to the above specification accordingly.
Important Points before Setting up
Carefully remove all packaging to gain access to the enclosures. During installation it is helpful to have some one to assist as the speakers are quite heavy. Remove the tools and spikes which are packaged separately. Please take a little time to read the rest of this booklet before you begin setting up the system. You are advised to retain all packaging as it is essential for shipping the system safely.

Patient and careful setting is essential to obtaining the maximum performance from this system.
Note well the PRECAUTIONS stated below.

The NdFeb Magnets.
These are powerful motors do not bring any metallic objects or sensitive electronic electromechanical or mechanical systems into close proximity of these devices. The company cannot accept responsibility for any damage to any such systems as a result of accidental damage.

Location
Please refer to the section at the back of this manual in order to determine position.

Spikes
The Spikes that have been specifically designed for the Bishop Loudspeakers should be treated with caution. Turned from stainless steel which is very hard they are very sharp and can easily inflict a severe wound to the unsuspecting and careless. When setting up the speakers it is a good idea to leave the spikes off the speakers until the correct position for their operation has been found.

PRECAUTION : WHEN POSITIONING THE SPEAKER IN THE ROOM ENSURE THE SURFACE HAS NO SHARP PROTRUSIONS WHICH WILL SCRATCH THE HIGH QUALITY SURFACES OF THE ENCLOSURE.

When the position has been identified through listening tests, tape can be used to mark the location prior to moving to one side to install the spikes. The vertical attitude of the speaker can be varied. The position of the tweeter has been designed to function best for listeners seated in conventional relaxed seating positions. If required for other situations such as listeners on higher seating or standing the speakers can be tilted back so as to fire the tweeter upwards.

The spikes are manufactured by Wilson Benesch and have been engineered to uncommonly high standards. They must be nipped up with the spanner provided in order for them to function properly. Do not under any circumstances apply a great deal of force as this may relieve the front spike boss from the foot. Large torsional loads are simply not necessary, just enough force to gently lock the spike in place.
Terminals

PRECAUTION: DO NOT OVER STRAIN THE TERMINAL WHEN CLAMPING CABLES.

(Wilson Benesch recommend 8mm Ring Connector cable terminations)

The Terminals have a crucial role to play which must be executed reliably over long periods of time. Wilson Benesch terminals are a piece of industrial design in themselves. Their elegance is born of simplicity and they achieve their purpose without compromise. They were designed by Wilson Benesch in order to achieve the level of performance required by the advanced design, of which they form an important part. They provide the shortest possible route for the signal and in this aspect they out perform all other terminals currently available. They are turned from a single bar of high purity brass and exploit the common nut to ensure a reliable, vibration free termination of the cable to a massive surface area. Exploit good quality 8mm diameter ring connectors and you will achieve the best possible link. You can be sure that this inexpensive nut will be just as tight today as it will tomorrow or the next year and once locked you can forget about it, out of sight, peace of mind cable terminations. A spanner is provided to nip up the gold plated brass nuts, but be careful - brass is a soft material.

The terminals also allow the use of banana plugs, but push in connectors always represent a compromise over the superior screw thread and ring terminal connection described above.

Running In

Like anything of good quality a period of running in tends to see improvements in performance. The speaker cabinet requires time to settle in to its surroundings. Climatic variations and humidity will take time to adjust to and until such adjustments have been made the speaker will not perform at its best. The drivers require time to bed in physically and relax materially. The carbon panels actually improve in structural integrity as they age. The quality of the sound that you hear when you first use your Bishops will improve quite significantly over time though the change will not be instantly perceptible.

Surface Finish

Carbon fibre is a unique material with unusual physical and visual characteristics. We like to remain truthful about the fibrous nature of the material as opposed to concealing or obscuring it. It should be appreciated that whilst we take every effort to produce absolutely perfect panels the occurrence of slight distortions in the fabric is inevitable. This phenomenon is virtually impossible to control and is a natural characteristic of the material. The natural wood components are manufactured using real-wood veneers. They will darken over time and, depending on the climatic and heating conditions will stress relieve. This is a natural phenomenon that may cause slight changes in the dimensions of the wood. These are typically imperceptible.

The surface finishes applied to the Bishop Loudspeakers do not require anything other than the occasional dusting. Treat the driver cones with respect and they will last a decade with relative ease.

Due to the angle of the cabinet top, the appearance of stains as a result of the inconsiderate placing of a glass is of course impossible. With a little care the speakers will look as good in ten years as they do to-day and will probably sound even better!
OTHER ADJUSTMENTS.

Under no circumstance should you make any adjustments to the systems parts. Any adjustments not described above as required by the setting up procedure will nullify all guarantees.

Should there be any question regarding the performance of this system you should refer to your dealer immediately for advice and or assistance. If in the unlikely event that the problem cannot be dealt with by your dealer do not under any circumstances return the goods to Wilson Benesch without prior consultation with Wilson Benesch. Wilson Benesch will not accept any liability for costs incurred by the owner for goods returned without prior notification through the dealer. Wilson Benesch will not accept responsibility for any damage that might occur to the speakers during shipment unless it is by prior notice through the dealer.

The subject of room acoustics.

Acoustics is a complex subject and this text should be treated for what it is, a simple but for some informative guide. For a more in-depth understanding you would need to refer to a whole range of texts on the subject. The most important outcome of this should be the greater appreciation of the role played by the room on the overall sound of the audio system.

The air contained within the room is the link between the output of the loudspeaker and your ear. How air behaves is dependent upon the attributes or character of the room. It follows that a better understanding of basic acoustics and what facets cause the most influence in the room will assist in making decisions about the way in which the room and subsequently the system can be improved.

Room types fall between two extremes. A room can be “dead” on the one hand (full of highly energy absorbent materials and complex diffusing structures) or very “lively” on the other (few reflective surfaces and a high proportion of very reflective hard non absorbent surfaces). As so often is the case, a balance of materials is commonly preferable to one extreme or the other. The correct balance for the end user is the goal.

Room attributes which can be changed easily.
The contents of the room impact upon the overall acoustic character of the room. As you would expect, hard surfaces like glass and concrete tend to reflect a broad band of acoustic energy. Complimentary materials that are soft and thick in section such as heavy natural fibre curtains will tend to absorb a broad band of frequencies.

Room attributes that require more consideration.
The other important factor is room dimensions shape and substantial internal structures within the room.

What are Standing waves?
Soundwaves reflecting between two parallel walls set up resonance modes when: -
One-half, or a whole multiple of one-half, the wavelength of the sound wave is equal to the distance between the walls.

These resonance modes are referred to as “standing waves”. In loudspeakers with parallel walls these waves will cause distortions. The standing waves in your room will distort the reproduction of your system sympathetically boosting certain frequencies.
If a certain standing wave frequency is acoustically isolated from its modal neighbors, its effect is more likely to be audible and problematic. This can compromise the accuracy of any loudspeaker.

To analyse your room for standing waves we would recommend that you work up to about 300 Hz. Beyond this point they become less relevant and difficult to perceive. Any standing wave below 300 Hz is detectable and should they combine sympathetically the result will be a lumping together and this is very undesirable. Evenly distributed modes are the goal.

**Characterising the room.**
Characterising the behaviour of the room is the first step towards your understanding of your listening room’s contribution to the audio system. Follow the simple procedure below to obtain a better understanding where changes could be made in order realise improvements.

1. Record data of the room dimensions onto a simple floor plan. The graph paper can assist you with this.
2. Apply the data (dimensions) to the formula
3. Make a record of the predicted standing wave frequency characteristic for each parallel wall dimension of the room.
4. Verify your predictions using the Wilson Benesch test CD which has a number of fixed frequency tests and swept frequencies. Use these to verify and back up your predictions.
   - **Note 1** Big differences in perceived and calculated values will indicate an error
   - **Note 2** If the predicted frequency matches with the perceptible increase in output in the room this has verified your prediction.
   - **Note 3** The listening tests should be taken whilst seated in the main listening position.
   - Evaluate the data and look for errors.
5. Assess whether changes should be made and what can be changed in order to overcome any dramatic and clearly in-accurate increase in sound pressure levels.

**Middle and High Frequency Room Characteristics.**
The middle and high frequencies are affected more by room contents rather than room shape. The “sound” of a room is described by the surfaces and how they reflect, absorb or diffuse the acoustic energy. Like all energy, acoustic energy cannot be destroyed, it can only be converted into something else or reflected. The shape of the surface will determine how it is reflected and the material will determine whether it is absorbed. All rooms have a particular sound, and to appreciate what influences are present in your room you should be aware of how the objects in your room will respond to sound.

Sound waves behave in the same way as light waves or "rays" and so imagine the driver to be a flood light.

**Reflection:** acoustic energy is not converted but reflected in an orderly, predictable fashion.
**Diffusion:** acoustic energy is dispersed in a random and or disordered fashion.
**Absorption:** acoustic energy is converted into kinetic energy or heat. All or a majority of the sound energy is "soaked up" or disposed of by the object surface or room boundary.
Loudspeaker positioning

There is no objective criteria that can be used to state precisely where loudspeakers should be positioned. Should any individual or company suggest that there is, they should be regarded as special people and treated with a great deal of caution. In the global scenario our loudspeakers are driven by unique systems that are selected by the owner because of particular virtues. Every listening room is as individual and unique in character as the owner. Compound this complex picture with the combination of different equipment. Consider the changeability of rooms, if the room is dressed with heavy curtains simply changing the curtains position can alter the whole balance of the system. The only rule is that there are no rules. Like producing good wine it is the goal that is the only guide. The owner is the pivot in this subtle balancing act.

The goal of high performance audio systems is accurate reproduction. The information be it in groove or pit form should be transcribed, amplified and converted back into sound energy without the additional views of the audio equipment designer being combined with that translation process.

When one considers this and finally that what one actually hears is a unique experience and subject to the realms of subjective evaluation. It is for these reasons that when making recommendations about positioning loudspeakers it is only possible for very general advice to be given.

In order to make the task of positioning the loudspeakers less complex we would like to make the following suggestions. That most valuable commodity, time, is the most important ingredient in this process. Be prepared to make small changes over longer periods of time.

Chose four musical passages that you are familiar with that can fulfill the following tests. They should all be stereo recordings.
Select one with a distinctive and easily heard human voice. Spoken voice is ideal.
Select one passage with a full orchestra like The Pines of Rome.
Select one that is very emotional for you.
Select one that has a strong rhythm as in the case of dance music.

You should appraise the performance of the loudspeakers according to your needs based upon the tests above.

The Power of Limits.
Air, the medium by which dynamic drivers communicate can be regarded as a liquid, very difficult to predict and even more difficult to control. When the driver is built into a small enclosure the complexity of this problem inevitably grows and in fact, of all the components in the audio chain it is the loudspeaker that produces by far the highest levels of distortion. Although the potential for improvement is large, the physical problems that must be addressed are of similar proportions.

A well known audio critic asserts in his opening paragraph that the drive unit is the major component of modern loudspeaker design. Whilst we would agree it is important it is as we have clearly demonstrated, no more important than the enclosure.

The moving coil drive unit is a powerful oscillating motor. It reacts with the enclosure in its effort to convert electrical energy to sound. Undesirable by products created during this process must be eliminated as much as possible. To date all but very few enclosure designs have chosen to discount or underestimate the importance of this key concern.

Typically such enclosures can be seen to be composed of flat panels which can be easily excited. The inevitable predominance of standing waves and high levels of diffraction all combine to destroy the accurate recreation of sound. The limitation here is the cabinet makers box. The ability of such designs to perform has always been compromised from the outset. The larger the box the more the system could be seen to go beyond its severe limitations.

In contrast the BBC LS3 5a was successful because it recognised these limitations. It minimised the problem of cabinet distortion by accepting the limitations of the technology. The generation of low frequency energy poses major problems so by limiting the low frequency response it confined its task to the bandwidth of its limitations. The choice of a small, light but very strong box was the outcome of this philosophy, a classic solution. For Wilson Benesch it was the recognition of these limits and a similar respect for the physical limitations of materials that informed our approach. This emerged from our work in turntable design where we had pioneered the use of carbon fibre and Advanced Composite Technology structures. The limits can be pushed back, but it requires research and development and the application of leading edge technology and assembly techniques. The A.C.T. One Loudspeaker enclosure was the conclusion of this philosophy. Its success has clearly demonstrated just how important the enclosure is.

Within its limitations the A.C.T. One enclosure made high quality, low frequency reproduction achievable. For other audio engineers as well as audio critics it subsequently became an invaluable development tool. When we attempted to extend these limitations by demanding a lower frequency response we went beyond those limits. Overcoming this significant technological challenge has been the principle focus for our research over the last three years.

The benchmark that the A.C.T. One loudspeaker set in terms of integration and mid range transparency prescribed that the low frequency performance should be similar in every regard. The outcome of this development has major implications for the company which can now boast a manufacturing facility for advanced moving coil drive units that have successfully overcome the limitations of the drive units currently used in the A.C.T. One Loudspeaker.

The Bishop loudspeaker system exploits this new technology to the full. Conceived, developed and manufactured from raw materials by Wilson Benesch The Tactic® is an adaptive design. In the mid range system it functions in parallel. In the low frequency system it takes the form of a composite system the Isobaric Tactic®. The Bishop is a unique product. It incorporates the most advanced technology but in a simple way, the hallmark of Wilson Benesch design.

The Bishop: General Design Features.
The Bishop was developed with two discrete isolated enclosures for the low frequency, mid range and high frequency systems. This immediately reduces corruption from cross communication. A two box system also provides other advantages in terms of manufacturing and installation. Curved pre stressed Advanced Composite Technology panels are key structural components in both cabinets. An organic moulded carbon component has been developed to facilitate low defraction and negligible resonance from this critical part of the structure. The form and angle of rake eliminates the potential for ceiling to box top interactions. The whole system is mounted on a substantial foot system which also houses the adjustable crossover system whilst providing a high degree of stability. All components are manufactured in house with the exception of the tweeter which is specified to Wilson Benesch specifications and mounted in a simple but very effective damping ring on the alloy MDF composite baffle structure. It provides clearly defined information from 5kHz to 20kHz via a single inductor capacitor 1st order crossover network. Its position has been derived from trials which focused upon phase coherence. The Mid range units are driven well within their prescribed specification and are controlled by a bandpass filter. All low frequency information being devoted exclusively to the Isobaric Tactic® system. Significantly low frequency energy is provided by drivers that are almost identical to the mid range systems. This dictates that integration and phase coherence will be virtually guaranteed. To further overcome the enormous challenge of low frequency reproduction these units have been mounted in a clamshell composite configuration which we call the Isobaric Tactic®. By exploiting the principles of the Isobaric loading the volume required by the low frequency driver array, ( eight in each channel ) has been minimised despite this advantage it is still five times greater than that of the A.C.T. One Loudspeaker low frequency enclosure. This has been achieved by extending both height and depth but not width. This important detail maintains the slim forward facing profile which is crucial for imaging and transparency. Moreover, the exterior has been extended without accepting the unacceptable compromise of the flat surface. Low frequency production is extended down to 30Hz without the use of the ported enclosure loading which is compromised from the outset due to the highly resonant characteristics of the port output which is of course is always 180 degrees out of phase. This delay is eliminated in the infinite baffle arrangement. The speed of the attack and decay are the main benefactors as a result of this approach.

**The Tactic® Dynamic Driver.**

Early in 1996 a 12 month feasibility study concluded that currently available driver technology would not be capable of taking the companies ambitions forward. The study indicated further, that significant potential for development existed but that it would be a major under taking. The decision was taken for us in many ways, the moment we realised how innovative the final product would be. At that time our attentions were focused on the creation of low frequency information and in particular the ability of that system to integrate well with the improved mid range performance. Orientation was also studied, side firing notably being the most un-popular. Loading the system with transmission lines was appraised as was the closed box. Many hours of research was devoted to the search for a solution to the problem. The breakthrough was made when the Isobaric method was explored. Using B stock Scan drivers in a hastily assembled MDF box, for the first time, it was instantly recognised as the right solution. An obvious answer in retrospect for with drivers of similar physical proportions to the mid range system matching would be axiomatic. For the first time we could hear highly integrated, high performance reproduction that was un-questionably superior to the A.C.T. One.
We identified a number of technologists that would help us surmount the gaps in our capability to manufacture our own drivers entirely at Falcon House. In collaboration with these engineers the company has moved forward rapidly. CAD / CAM systems have played a big part in accelerating the work. Prototypes have been made in numbers and fine tuning has been simplified as a direct result of this manufacturing capability.

**The Tactic® Dynamic Driver, outline of component parts.**
Advanced chemical engineering that is quite unique is used in the diaphragm. In a collaborative development with Professor I.W. Ward a material that is superior to all current alternatives has been realised. Produced from a woven Isotactic polymer this leading edge technology provides for the most ideal diaphragm material. The high quality reproduction is superior to all our current benchmarks.

The Tactic® motor system development program was greatly accelerated as a result of our in house CAD CAM facilities. Despite this capability (unique in the U.K.) the development of the motor has been lengthy.

We started out with the “nothing is new under the sun” approach and subsequently took a retrospective look at loudspeaker developments. One of the most notable products was the Alnico magnet driver which was always noted for its superior performance in the mid range. Our research studied this phenomenon as a possible alternative but it soon became clear that the difference was attributable not to the type or qualities of the Alnico magnetic material but because of the small diameter and as a corollary small reflective shadow. Because out of phase energy cannot be reflected back through the cone, much lower levels of distortion are achievable. The rearward traveling sound waves pass into the enclosure unimpeded from here the enclosure takes on responsibility for dealing with this unwanted energy. Transmission of these out of phase reflections through the cones is quite normal in conventional ferrite systems where large in efficient magnets must be used. The distortion, smearing and boxy sound that is accepted is notable by its absence in the technology of The Tactic®

Although The Tactic® is in fact half the physical size and mass of the Scan benchmark used by Wilson Benesch and so many others to date, it is in fact almost 50% more powerful. Such an increase in performance is no mean achievement. It provides the amplifier with that much more control of the diaphragms movement. It provides greater control over the diaphragm, being able to accelerate and decelerate it more effectively. This powerful motor provides dramatic improvements in all measurable parameters relating to control.

The basket has been developed from first principles. Natural forms are evident as one can see, very different from the crude structures accepted by the “state of the art” to date. Refined on CAD CAM and tuned exactly to our needs it delivers the primary function of high stiffness but uniquely, without restricting the movement of air behind the diaphragm which is considerable, particularly behind the low frequency drive systems. Notably there are no flat resonant sections. The curved organic form is created on CNC tooling to exacting tolerances and accuracy. They are machined from a single billet of aluminium and are incredibly stiff.

The Wilson Benesch basket is an important technological advance. It provides us with the all important performance advantage that makes the difference between a
good product and an innovative benchmark product. It goes a long way towards achieving the quality of performance that we need to take the next step forward in loudspeaker system design. That it exhibits a negligible rear shadow and excellent air flow characteristics is remarkable enough. That it achieves this whilst improving physical strength is all the more important. The combined effect of these innovations is immediately detectable but the story does not end here. Because we designed the driver and enclosure together the ultimate conclusion is that much more significant. The Tactic® was developed to operate as an individual unit and as composite system in the form of a clamshell. Here it can be seen that the curved structure form of one basket is completed to form an uncompromising sphere. This naturally stiff component fosters an unyielding structure which is elegant and simply ideal.

The Isobaric Tactic®
The laws of inertia dictate that any stationary object prefers to stay in that state. Once set in motion opposing forces must overcome the inertia of that object. Speaker dynamics are based on this basic premise. The Isobaric Tactic® attempts to overcome this physical problem by applying more control through more power, reducing mass and realising stiff structures throughout. The Clamshell Isobaric system achieves this by coupling two drivers. The composite driver functions as a single component but with double the moving mass, half the impedance and subsequently double the current, result double the power. The higher mass of the cone enables a lower system resonance and in addition the composite cone allied with the benefits of the enclosed air gap effectively reduces the communication of out of phase energy from inside the enclosure.

In the Bishop eight of these systems have been developed to achieve this task alone. The curved forms of the Tactic® when mirrored creates a sphere with intrinsically high stiffness to weight ratio. The sphere is further enhanced by the composite alloy MDF interface between the two drivers This 20mm thick component links the drivers realising essentially one uncompromising single basket system. This guarantees the highest level of matching between the separate drivers. The combined effect of this innovative solution is remarkably fast, well integrated low frequency information. The strong similarities between the drivers and mounting arrangement culminates in highly integrated reproduction that we believe represents an industry standard.

The wiring options.
The high levels of accuracy realised by The Bishop loudspeaker is the result of a single objective with only one design envelope. It was not designed to be used in a discotheque nor was it designed to separate frequencies so as to monitor them in a studio. It attempts to disappear by providing a coherent wave of sound. It does not try to do all things but what it does, we believe it does better than any other loudspeaker in the World. Precise matching is fundamental to the performance of the system and so for this reason we have provided the user with this capability without adding any complex switching or linking systems.
The Bishop loudspeaker provides for a variety of wiring configurations. All terminals are high quality terminals that are manufactured by Wilson Benesch. A spanner is provided for the ultimate, spade type connector that will guarantee a good quality termination to the loudspeaker system. The loudspeaker can be wired with a single feed, bi wired or tri wired. We recommend good quality cable with a low inductance capacitance characteristic. As always care and attention should be paid to how cables are dressed to the system avoiding proximity to large power amplifier transformers and other devices that might emit strong magnetic fields. Do not over tighten the nuts as you risk damaging the mounting plate. Use the spanner provided for this purpose. Do not use pliers as this will damage the gold plating and lead to corrosion of the brass nut.

In addition to these conventional options the system can also be wired to make allowances for either negative room effects or to allow the system to be driven at higher volumes. Why is the system designed this way?

The Bishop is at the very forefront of sound reproduction. Small changes either to the room or to the ancilliary equipment which feeds this system will have distinct and perceptible effect. These effects will be much more noticeable than with less well designed systems. Because of this we have provided designed the loudspeaker so that it provides much higher levels of flexibility than other loudspeakers and provide for the best possible level of integration into your listening environment. By providing two additional terminals on the terminal plate the user can convert the 2.5 crossover design to a higher power handling but less phase coherent 3 way design.

Alternative wiring facilities
Make sure that the amplifier is turned off before dis-connecting any wire feeds to the loudspeaker system.

Optional Terminal 1. Mid range frequencies.
The 2.5 crossover design is a philosophical hallmark of all Wilson Benesch loudspeakers. This philosophy provides a wide bandwidth frequency response with very little deviation and perfect phase coherence. To achieve this with a passive crossover network the mid range driver must be of the highest quality and capable of handling very large frequency excursions. A crossover that rolls off low frequency energy does so at a price and that price is, out of phase mid range energy. The response that is produced is thin or less rich in sound quality and in the back of your mind you know something
is false. **Real music is coherent, it is in phase.** You do not get the snare 180 degrees out of phase with the bass drum!

For this very simple reason, the ideal is no capacitance at all or perhaps the best of both worlds is the option of both!

Selecting the Mid Frequency Range Attenuated terminal.
One wire is changed in order to select the alternative. The positive feed to the mid range system terminal should be moved to the attenuated terminal to enable higher power output levels to be achieved. A 6dB per octave roll off of low frequency energy is used to enable this mode of operation.

**Optional Terminal 2. High Frequencies**
High frequencies exert an enormous influence over the impression of the sound. Different listening rooms that incorporate soft furnishings as opposed to hard surface interiors will cause a big change in the perceived performance. The high frequencies are the frequencies that are more difficult to perceive with age and the personnel preferences of the listener all directly related to the tweeter and its output. We have set the system so as to provide the correct level in a typical room response but because the variety of rooms that the Bishop will be played in will probably be as diverse as one can possibly imagine At this level of performance we feel that it is important to be able to effect changes over the balance of the high frequency output. The attenuated terminal in this case allows for simply a small reduction in the efficiency of the tweeter output.

Selecting the High Frequency Range Attenuated terminal.
One wire is changed in order to select the alternative. The positive feed to the high frequency terminal should be moved to the attenuated terminal to reduce the high frequency output by 3 dB.