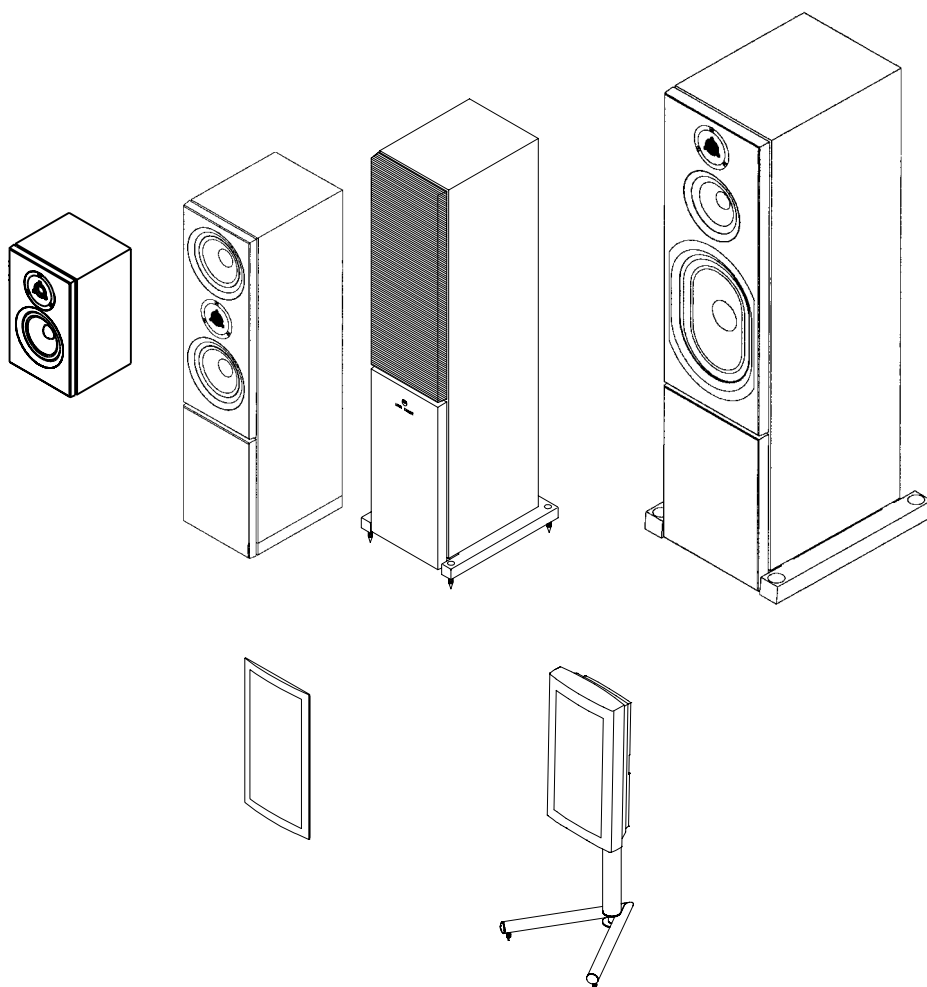


# LINN



# LOUDSPEAKERS

## SECTION 6 - LOUDSPEAKERS

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## **LINN LOUDSPEAKERS**

Loudspeakers are the final link in the hi fi chain. The challenge of making loudspeakers perform properly is similar in many respects to getting the best from turntables. When a speaker converts signals into sound waves it involves movements similar in scale to a stylus in a record groove in addition, of course, to much larger movements.

To reproduce music accurately, the speaker's drive unit movements must be very precise. The task of speaker engineering is essentially a mechanical one, whilst at the same time requiring the highest quality of electrical components.

### **ISOBARIK**

Linn's KELTIK loudspeaker has the patented 'Isobarik equal pressure' system, first used in the Linn Isobarik. Behind the visible bass speaker is another mounted inside the cabinet. With this system, the front speaker works as if in a much bigger enclosure.

### **PASSIVE PLAYBACK**

With a passive loudspeaker, the signal from the amplifier is divided into three frequency bands, (bass, mid and treble) by a passive filter built into the loudspeaker cabinet. This is powered by the signal itself, absorbing some of the amplifier power, and preventing the amplifier from accurately controlling the loudspeaker.

Although the highest quality components are used in Linn loudspeakers, there are several fundamental limits to the performance of a passive loudspeaker system.

### **ACTIVE PLAYBACK**

An active crossover frees the loudspeaker system from these limits. It accurately divides the signal from the preamplifier into three frequency bands, and feeds each to its own power amplifier. The loudspeaker drive units are directly controlled by the power amplifiers. The electronic circuitry of the active crossover makes it possible to control the drive units in the AKTIV speaker precisely and over an extended frequency range.

The combination of active crossover, high power amplifiers and advanced loudspeaker drive units in the KELTIK system results in an extremely accurate, musical system which is capable of playing music at realistic sound levels. The KELTIK is only available in Aktiv while all other LINN speakers (excluding AV5110) can be used in Aktiv or Passive versions.

### **CABLE**

Linn use 20 amp multistrand copper cable for optimum sound quality.

### **ASSEMBLY**

Each assembler builds, tests and packs a complete pair of speakers at purpose designed work stations, to ensure that matching pairs of loudspeakers are produced.

### **SERVICE MANUAL**

This section contains important information on set-up and service of Linn loudspeakers, the history of each loudspeaker model, speaker fault finding and repair guides together with specifications.

## GENERAL SET-UP OF LINN LOUDSPEAKERS

### 1. Speaker Cable

Linn recommend K20, K400 (BI-WIRING) and K600 (TRI-WIRING) cable.

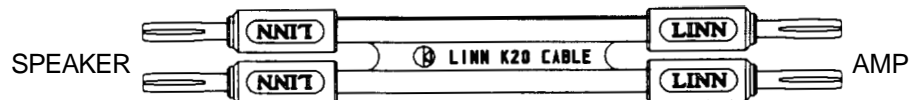
#### Phasing

Check phasing is correct. Remember that the Linn KAIRN (and LK1) pre-amplifiers invert the phase; therefore, connect to the power amplifier with phase inverted, i.e.. black, negative (-) amplifier speaker output to the red, positive(+) speaker input.

Conventional practice is to invert at the power amplifier.

#### Directionality

Check that direction of cable is correct. Logo goes nearest to speaker. Ignore the "arrow" inside the logo as it has been known to point the wrong way.



#### Speaker Plugs

Always use Linn speaker plugs and make sure leads are correctly soldered on to plugs.

#### Cable Runs

Keep cables flat and do not twist. If bi-wired or tri-wired use K400 and K600. If using K20 try to keep cables separate. Do not bunch up or twist together.

#### Cable length

It is recommended that the cable runs be kept as short as possible to minimise signal losses. Left and right channels should be the same length to avoid channel imbalances. Where long speaker leads are required the other option is to locate the Power Amplifiers near the speakers and use Long Interconnect cables to the Pre-Amp and short speaker leads instead.

### 2. Drive Units

Check speaker units for tightness. All screws should be tight, but do not over-tighten as this can cause damage to the drive unit. Please use common sense as a buckled speaker chassis is worse than a loose screw!

### 3. Positioning Loudspeakers

Positioning a loudspeaker in the room is very important, as a bad position can ruin the sound and prevent you achieving the best results.

Most Linn speakers are designed to work close to, or against, a wall (5 - 10 cm), except for Helix and Nexus which are high efficiency models and can be placed well into the room if necessary. Exact position should be determined by auditioning and experimenting. In a rectangular room it is normally better to position speakers on the long wall, facing across the room. If the listening seat is close to the speakers it may be necessary to angle them slightly inwards toward listening centre.

Once position has been decided check the stands.

### 4. Speaker Stands

Always use dedicated Linn stand for best results. Speakers must be set firmly on stands with no perceptible movement. Adjust spikes and position on floor until the speakers and stands are rock steady.

**Always lock spikes firmly in position using a proper spanner. Finger tight is not good enough.**

SPEAKER UNITS**GENERAL INFORMATION**

This will give some general information on the faults , (and abuse!) of speaker units. The most common cause of failure is over-driving which may result in:

Distorted sound,  
Low output,  
And finally:**No Sound**

All faults can normally be confirmed by opening up the unit and examining the voice coil. **Be warned that once a unit is opened it can not be reused and will have to be replaced, so only do this if the unit is confirmed as being faulty.**

**DAMAGED UNITS****1. CURRENT OVERDRIVE: (All units)**

When playing the music too loud (parties etc) or when driving a low powered amplifier into clipping the current across the voice coil can become excessive and cause the speaker voice coil to overheat.

First:

The enamel on the coil will start to blister and swell and this will cause distortion as it will touch and rub the sides of the magnet gap as the voice coil moves forward and backward.

Next:

If the condition that is causing the blistering to occur continues, (the volume is not turned down) the blistering will increase until it is large enough to restrict or stop the voice coil moving This will result in increased distortion, reduced output and finally - no sound.

**This can be seen by opening up the speaker and examining the voice coil.**

**Remember, opening the unit is final and not reversible so the unit will be need to be scrapped.**

Finally:

The voice coil wire burns out and either goes open or short circuit. The unit is now dead. This can be confirmed by checking with a multi-meter set on ohms: Typical reading for a good unit is around 6- 8 Ohms.

**2. HIGH FREQUENCY OSCILLATION: (Treble units)**

This can occur with unstable or faulty amplifiers which generate high frequency signals (which may sometimes only be audible to the neighbourhood cat) which will cause the unit to overheat due to the excessive High Frequency current. - see point 1. These H/F signals can also occur where there are earthing problems. Some named amplifiers go nuts should you disconnect the earth while the volume is up, especially phono earths.

**3. TRANSIENT DAMAGE: (Treble units)**

This can happen when a large transient signal is applied to the speaker such as letting the stylus fall on the record with the volume set very high, fast cuing (fast fwd or fast rev)of a tape recorder with the volume set high etc.

This will cause the voice coil to "leap" forward (or backward) beyond the limit of its normal travel which may break the voice coil lead wire at the start of the coil.

**4. DC VOLTAGE ACROSS THE SPEAKER. (Bass and Mid-range units)**

Should a power amplifier become faulty and produce DC across the speaker output the voice coil(s) will overheat and become damaged or destroyed (See 1). However as the treble units in passive speakers are driven through a by-pass filter they will not be damaged unless the voltage is sufficient to burn out the crossover, after which all the units may be destroyed.

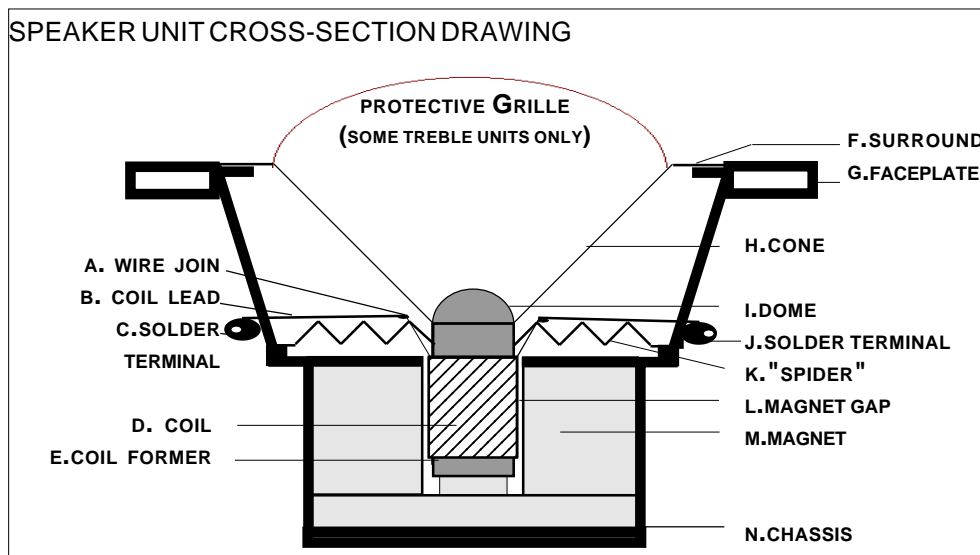
**WARNING:**

Care must be taken to ensure that the cause of the damage units is found and corrected, so that the same thing will not happen again. This is not always possible as customers seldom admit overdriving their speakers so the first question could be: Was it a good party? If in any doubt, the system should be checked, in particular the amplifiers and associated wiring should be examined and any faults rectified. The amplifier should be tested under load for any nasties.

**5. PLAYING MUSICAL INSTRUMENTS. (All units)**

Electronic instruments and electric guitars can generate a lot of transients with little or no limiting! This will simply fry the treble units as they were never designed to be used in this application.

ANY DAMAGE TO SPEAKER UNITS CAUSED AS PREVIOUSLY DETAILED IS NOT DUE DUE TO FAULTY MANUFACTURING AND THEREFORE NOT COVERED BY MANUFACTURING WARRANTY.



**FAULTY UNITS.**

**TREBLE UNITS**

Occasionally on early treble units we encountered a problem with the soft dome where the internal join between the input wire and the voice coil wire had not been soldered correctly. This resulted in a dry joint which can give a intermittent or dead treble unit. Should you suspect this, gently tap the speaker unit while playing some music. If the unit cuts out this may be the cause.

Again, this can be checked with a Multi-meter set on ohms: Typical reading is around six Ohms. If the unit measures correctly **gently move the dome with your finger** while measuring the speaker.

## SPEAKER UNITS

### **FAULTY UNITS.**

#### **TREBLE UNITS (continued)**

Finally this can be confirmed by opening the unit and checking for damage. If the coils have no sign of over-driving then measure with the meter. It is possible to scrape off some of the enamel of the coil wire in the middle of the coil and measure to each of the solder terminals, this will tell you which side the fault is on. Then by examining the joint with a magnifying glass (or microscope) you may be able to see the poor joint. This can occur because the enamel was not removed properly before the joint was soldered.

### **MID-RANGE AND BASS UNITS.**

#### **VOICE COIL OFF-CENTRE.**

The speaker has been wrongly assembled and the voice coil is off centre, so that it rubs the magnet and causes distortion. The easiest way to check for this is to use a signal generator and sweep through the frequencies slowly until you hear the distortion.

It is sometimes possible to feel this by hand, by gently pushing the cone in with your hand, but you must do this evenly in a straight piston motion in line with the cone movement or you will distort the cone and make it rub.

#### **SURROUND UN-GLUED**

It is possible to try carefully to glue this using CYANO-ACRYLIC, (known as "superglue") or contact adhesive but these repairs are not always successful as the repair must be air tight.

If you are in any doubt about a faulty speaker unit and do not wish to open the unit yourself, they can be returned to Linn Service for checking. Follow the normal returns procedure as described in the returns procedure. It is important to ensure that speakers are properly packed for return, using original boxes. Contact Linn Service before returning and remember that we may need the pair back.

**LOUDSPEAKERS FAULT FINDING**

Loudspeakers are generally very reliable with very few problems. Most problems are caused by overdriving eg. playing of keyboards through speakers, faulty amplifiers (DC at output) and physical damage to units.

<b>Symptom</b>	<b>Fault</b>	<b>Solution</b>
One speaker dead	Amplifier has tripped	Switch off and allow to re-set. Check for likely cause and remedy. Ensure enough ventilation for amplifier.
Blown Bass Drive unit.	Amplifier faulty, DC on output.	<b><u>Do not try with other speaker!</u></b> DC at speaker will cause the bass unit to overheat and can destroy the voice coil. Measure amplifier output for DC offset. Repair amplifier as required and re-check before connecting to speakers. Treble unit not affected due to bypass capacitor (Passive speakers).
	Overdriven bass	Replace unit - chargeable. Advise Customer on use of speakers. (Parties or deaf teenagers)
Treble unit dead	Blown treble	Replace unit. Check other Unit. speaker unit.
Dead or low output - treble unit	Treble unit dome pushed in.	Replace unit. Chastise child!
	Treble unit over-driven	Replace unit.
Intermittent unit:	Short on speaker cables	Check and repair. Break inside the unit on or around the voice coil. See previous pages on speaker units.
Cuts out or distorts at certain to Frequencies	Intermittent connection on Unit	Check soldering on unit terminals. Check leadout wires voice coil for short unit chassis. (bass and mid-range only) reposition wire if required.
	Faulty unit	Check with multimeter - should read between 6 - 8 Ohms. Gently move dome NOT CERAMIC TREBLE UNITS! (in and release) to check for dry or poor joint at coil. Replace if faulty.
	Dry joint on crossover board	Remove from cabinet and re-solder joints. Check legs of components for breaks. For DMS with 4 Ohm crossover try another crossover (swap from other speaker).



FAULT FINDING

<b>Symptom</b>	<b>Fault</b>	<b>Solution</b>
No treble on both speakers	Bi-wire links missing	Replace links, or better still, fit bi-wire cables.
No treble or bass on both speakers	Tri-wire links missing	Replace links, or better still, fit tri-wire cables.
Poor, or very little, bass.	Suspect phasing:  1. Speakers wired out of phase 2. Bass unit wired out of phase	Check all speaker cables between amplifier and speakers Check with battery and correct as required. See Phasing.
Poor sound	Domes pushed in	Replace unit - see Section on changing units
	Units loose	Tighten unit screws using correct tool. Do not over-tighten on plastic treble units as you may crack the mounting plate.
	Cabinet air leak (non-ported spkrs)	Gently push cone (not TREBLE dome!) in bass/mid unit. Hold for a second or two and then release. If unit does not "pop" straight out, but comes out gradually then the cabinets have an air leak. See Sealing Speaker section for repair procedure.
	Surround unglued from unit chassis	Replace unit.
	Speaker unsteady on stand	Adjust spikes until speaker is rock steady. Make sure spikes and lock nuts are tight. Use proper spanner, not just fingers!  If the floor is too uneven, reposition speaker on different part of floor, or repair the floor. Some stands bases now have the option of 3 spikes which makes this easier.  Check speaker is not rocking on stand. Adjust top spikes, or if they are fixed type, (as on top of some stands) push speakers onto spikes to bed them into speaker base.
Stand insert problems in Keildh speaker	Screw miss-threaded and stuck.	Replace insert. See page 30 for procedure.
	Insert pushed into the speaker	Fit new insert. See page 30 for procedure.

## **TO CHANGE SPEAKER UNITS**

### **Tools Required**

No. 2 pozidrive screwdriver

2.5 mm allen key

Heavy duty (50 W - 100 W) soldering iron with heavy duty soldering bit

Solder (Linn type if possible)

Heavy duty side cutters

### **General:**

Before you start, clean work area/bench of anything that might damage the cabinet. Remember, wood is easily marked so protect cabinet from bench, tools, loose screws etc.

### **Silicone Sealed Units:**

One aspect of this sealer, as used with earlier speakers, is its glue like properties. This can make it very difficult to remove units which have been sealed with silicone.

Do not try to lever any unit out with a screwdriver under the edge of the front plate as you will mark the cabinet. Read the following instructions before attempting any removal/replacement.

### **Kan Loudspeakers:**

Please note that the Kan loudspeaker Grille is glued in position and will require to be removed before replacing any units. To remove Grille, cut a hole in the cloth near the edge of the Grille, you will have to replace with a new Grille. Insert a flat bladed screwdriver between the Grille frame and the front baffle and lever off. Do not try to lever off against the cabinet as you may damage the cabinet.

TIP: The other way to remove the Grille without damaging it and possibly re-using it is to pull it off with your fingers.

Slightly stretch the fabric with your fingers by pushing in slightly over the bass unit, then catch the bottom of the Grille frame with your fingers and pull off. This does not always work but be warned: this can hurt!

### **Gasket Sealed Units:**

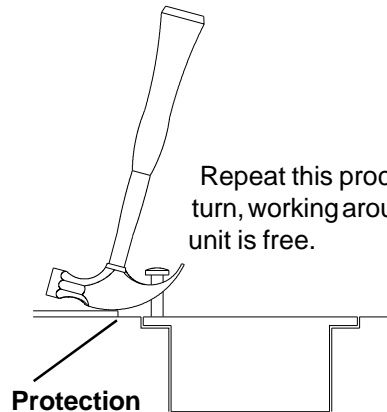
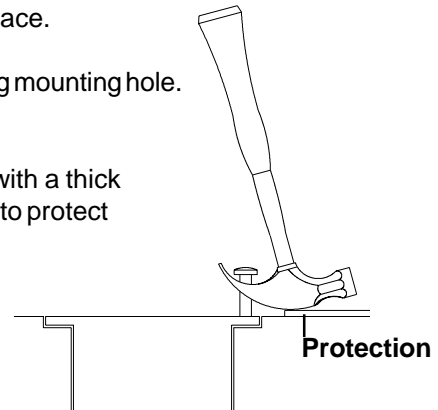
The LS range of Linn loudspeakers, Index II, Helix II, Nexus and Kaber were fitted with rubber gaskets, current models use foam gaskets. These facilitate the removal and replacement of units and should not present any problems. Use new gaskets if originals are torn etc.

GUIDELINES FOR UPGRADE AND REPAIR

**CHANGING SILICONE SEALED TREBLE UNITS.**

**Estimated Time  
required: 20 minutes**

1. Remove fixing screws and place in a safe place.
2. Screw a large machine screw into one existing mounting hole. M5 arm collar mounting screw is ideal.
3. Place claw hammer 'V' end onto bolt head with a thick piece of cardboard/wood under the hammer to protect the baffle and gently lever it out.
4. If it does not come out straight away, do not force it.



Repeat this procedure on the remaining mounting holes in turn, working around the unit and releasing each side until the unit is free.

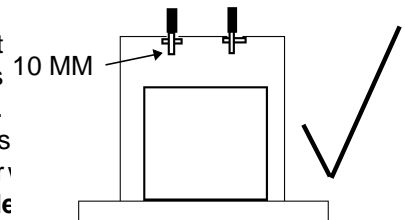
5. Make a note where the red wire goes (to terminal marked red or +).

6. Ensure there is sufficient spare wire. Cut wires close to the unit, and remove.

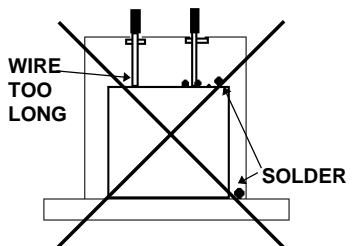
If wire is too short to allow for this, de-solder wires from the unit. Always protect cabinet from solder splashes.

8. Remove old sealant from the mounting hole, carefully scrape away with a flat bladed screwdriver.

9. For enclosed type treble unit, do not tin wire, but remove **not more than 10 mm** insulation from wires -and twist to ensure there are no loose strands. Observing polarity insert wires into terminal holes solder; use approximately 20mm, 28swg, solder per do not overfeed as solder ball will form inside unit.

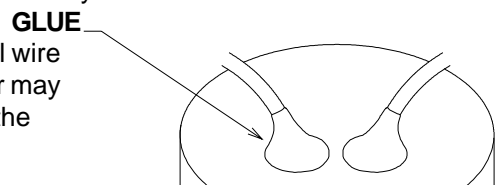


**Please note :**  
Please ensure that you follow these instructions. Using wire that is too long will cause shorts to magnet or wires inside the unit. Using too much solder will cause solder balls to form inside the unit which may result in rattles.



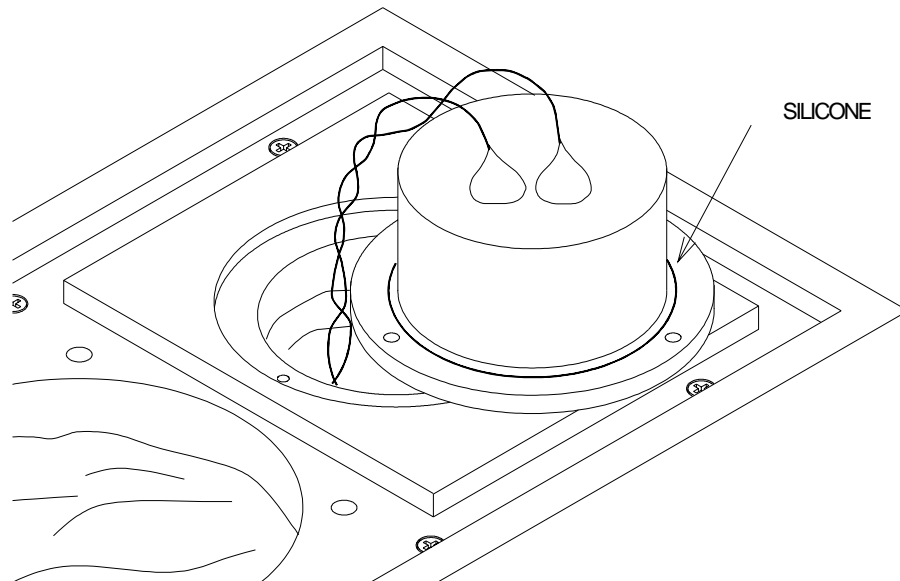
For other units, cut and tin (or re-tin if de-soldered) and solder wires to unit. Observe polarity; red wire to red mark or terminal marked (+). In the case of very early speakers the colours may differ. Consult your notes (point 4) and wire as you found it.

10. Where treble unit is enclosed type, seal wire holes with hot melt glue. Silicone sealer may be used instead, the object is to make the treble unit airtight.



**CHANGING SILICONE SEALED TREBLE UNITS.**

9. Rotate the treble unit loosely to twist the wires.
10. Place a bead of silicone around the top-plate inside edge. There should be enough to ensure air-tight seal.



11. Place unit into cabinet and fit mounting screws.  
**WARNING:** Be careful not to push T-nut into cabinet. Thread all screws in carefully until slack is taken up, then tighten screws. Do not overtighten as this can damage the front plate.
12. Clean off silicone sealer. When wet, scrape off excess with a flat bladed screwdriver and clean with a soft cloth. When dry, trim with a knife or simply rub it off with your fingers.
13. Re-fit Grilles:  
Kan only - glue new Grille in position using silicone or hot melt glue.
14. Audition speaker.
15. Polish and clean for customer.

GUIDELINES FOR UPGRADE AND REPAIR

**Estimated Time  
required: 20 minutes**

**CHANGING MIDRANGE / BASS UNITS.****Tools Required**

No. 2 pozidrive screwdriver	Sharp knife
4 mm allen keys	M5 nut runner
5 mm allen keys	Heavy duty side cutters
Heavy duty (50 - 100 Watt) soldering iron with heavy duty soldering bit	
Solder (Linn type if possible)	
Wide blade 3" - 4" (70-100mm) paint stripper	

In addition for ISOBARIK Bass Unit:	M8 tap and handle
M8 machine screw	4BA nut runner (for older DMS)

**General:**

Before you start, clean work area/bench of anything that might damage the cabinet. Remember, wood is easily marked so protect cabinet from bench, tools, loose screws etc.

Two methods of sealing are used:

**1. Silicone Sealed Units:**

One aspect of this sealer, as used with earlier speakers, is its glue like properties. This can make it very difficult to remove units which have been sealed with silicone.

Do not try to lever any unit out with a screwdriver under the edge of the front plate as you will mark the cabinet. Read the following instructions before attempting any removal/replacement.

**2. Gasket Sealed Units:**

The LS range of Linn loudspeakers are fitted with foam gaskets. (Some early ones used rubber) These facilitate the removal and replacement of units and should not present any problems.

**To Change Silicone Sealed Mid-range and Bass Units in Sara and Kan and Isobarik Midrange units. (For Isobarik bass unit see the next page)**

1. Remove fixing screws and place in a safe place.
2. Insert a thin screwdriver between mounting hole and speaker unit chassis and lever off against baffle. You will require to work your way around all the mounting holes of the unit until you break the bond on the silicone sealer.
3. Lift unit out of cabinet.
4. Make a note where the red wire goes (terminal marked + or red dot).
5. Ensure there is sufficient spare wire, then cut wires close to the unit and remove. If wire is too short to allow for this de-solder wires from the unit. Remember to protect cabinet from solder splashes.
6. Remove old sealant from the mounting hole.
7. Cut back insulation by approx. 10 mm and tin the wires (or re-tin if de-soldered). Solder wires to unit. Observe polarity, red wire to red mark or terminal marked (+). In the case of very early speakers the colours may differ. Therefore, consult your note (point 4) and wire as you found it.

**CHANGING MIDRANGE / BASS UNITS. (Continued)**

8. Place a thick bead of silicone around the inside edge of baffle. This should be enough to ensure airtight seal.
9. Place unit into cabinet and fit mounting screws.  
WARNING: Be careful not to push T-nut into cabinet. Thread all screws in carefully until slack is taken up, then tighten screws.  
Do not over-tighten as this can damage the front plate.
12. Clean off silicone sealer. When wet, scrape off excess with a flat bladed screwdriver and clean with a cloth.
13. Audition speaker.
14. Polish and clean for customer.

GUIDELINES FOR UPGRADE AND REPAIR

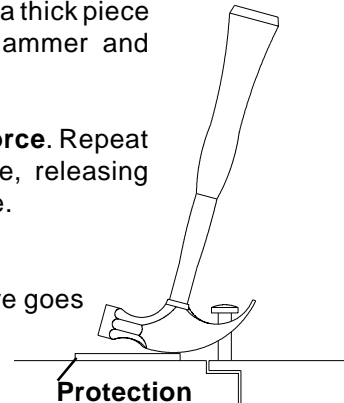
<b>Estimated Time required: 20 minutes</b>
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### TO CHANGE ISOBARIK SILICONE SEALED BASS UNIT

1. Peel off hot melt covering the mounting bolts. Remove bolts and place in a safe place.
2. Using an M8 tap, tap a thread into the top left mounting hole.
3. Screw in M8 machine screw.
4. Place claw hammer 'V' end onto bolt head with a thick piece of cardboard/wood protection under the hammer and gently lever it out.

If it does not come out straight away, **do not force**. Repeat above procedure on top right mounting hole, releasing each side a little at a time until the unit is free.

5. Make a note (write it down!) where the red wire goes (terminal marked+) or marked with red dot.
6. Ensure there is sufficient spare wire to cut wires close to the unit, and remove. If wire is too short to allow for this, de-solder wires from the unit. Always protect cabinet from solder splashes.
7. Remove old sealant from the mounting hole. Carefully scrape away with a flat bladed screwdriver.
8. Cut and tin (or re-tin if de-soldered) and solder wires to unit. Observe polarity, red wire to red mark or terminal marked (+). In the case of very early speakers the colours may differ. Therefore, consult your note (point 5) and wire as you found it.
9. Loosely twist the wires to the unit.
10. Place a thick bead of silicone around the inside edge of baffle. This should be enough to ensure airtight seal.
11. Place unit into cabinet and fit mounting screws.  
**WARNING:** Be careful not to push T-nut into cabinet. Thread all screws in carefully until slack is taken up, then tighten screws.  
 Do not over-tighten as this can damage the front plate.
12. Clean off silicone sealer. When wet, scrape off excess with a flat bladed screwdriver and clean with a cloth.
13. Place speaker on its back and seal the bolt heads of the unit screws with a drop of hot melt glue.
14. Audition speaker.
15. Polish and clean for customer.

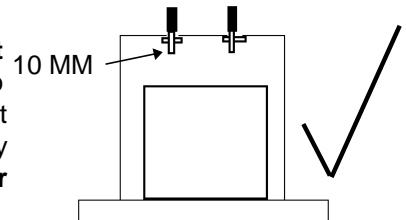


Estimated Time  
required: 20 minutes

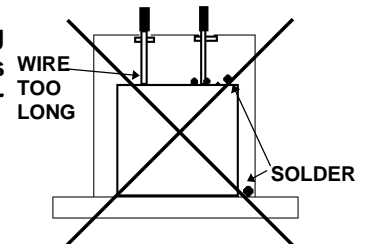
**CHANGING GASKET SEALED UNITS.**

1. Remove unit fixing screws and place in a safe place.
2. Lift speaker unit out.
3. Make a note where the red wire goes (terminal marked + or red dot).
4. Make sure there is sufficient spare wire, then cut wires close to the unit and remove. If wire is too short to allow for this, de-solder wires from the unit. Protect cabinet from solder splashes.
5. Cut and solder wires to unit. Observe polarity, red wire to red mark or terminal marked (+).

6. For enclosed type treble unit, do not tin wire, but remove **not more than 10 mm** insulation from wires -and twist to ensure there are no loose strands. Observing polarity insert wires into terminal holes and solder; use approximately 20mm, 28swg, solder per wire- **do not overfeed as solder ball will form inside the unit.**

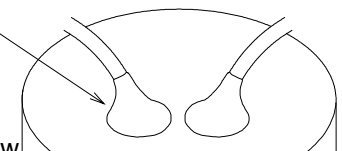


**Please ensure that you follow these instructions. Using wire that is too long will cause shorts to magnet or wires inside the unit. Using too much solder will cause solder balls to form inside the unit.**



Now seal connection with hot- melt glue. Silicone sealer may be used instead. The object being to make the treble unit air tight. **GLUE**

7. Loosely twist the wires to the unit. Simple way is to spin the unit a few (2-4) times but do not drop it!
8. Check that the gasket is still usable, if in doubt use a new gasket. Locate it in place, lining up the mounting holes.
9. Place unit into cabinet and fit mounting screws.



**WARNING:** Be careful not to push unit T-nut into cabinet. Thread all screws in carefully until slack is taken up, then tighten screws. Do not over-tighten as this can damage the unit front plate.

13. Audition speaker.
14. Polish and clean for customer.



CHANGING COMPONENTS IN THE SEKRIT

**Estimated Time  
required:  
20 minutes**

**How to remove the speaker baffle.  
(LS7000 On wall ONLY)**

**PROCEDURE:**

1. Remove the SEKRIT from the wall.
2. Put the speaker carefully on it front on a clean, protected table/workbench.
3. Remove the 4 speaker input collars using the special tool provided with the speaker.
4. Turn the speaker to other way up and remove the GRILLE and foam insert using a small pointed object.
5. Remove the 8 retaining bolts from the front of the baffle, taking care not to remove the unit screws.
6. Put the speaker on its front and lift the cabinet from the baffle.

**How to replace the bass unit  
(LS7000 OnWall and LS6000 InWall)**

Parts required.

Replacement bass unit. LS7000 On Wall	SPKR 020/1
LS6000 In Wall	SPKR 017/1

**Procedure:**

1. If speaker is on wall (LS7000) remove the front baffle.
2. Pull off the speaker wire "push-on" connectors from the bass unit.
3. Turn the speaker the other way up and undo the 4 M4 screws holding the bass unit to the front baffle.
4. If Clamping ring is used, remove the whole bass ring and assembly- separate the ring from the bass unit and fit to the new bass unit.  
If clamping tabs are used, remove these, then the bass unit.
5. Remove old Gasket and fit a new one.
6. Fit the new bass unit ( see 3).
7. Refit the clamping tabs/ring with screws from the front baffle.
8. Reconnect the electrical "push-on" connections, red to the red terminal (+).
9. Refit the cabinet on wall (LS7000 only) using the 8 M4 screws.
10. Refit the socket collars and the front Grille.
11. Test

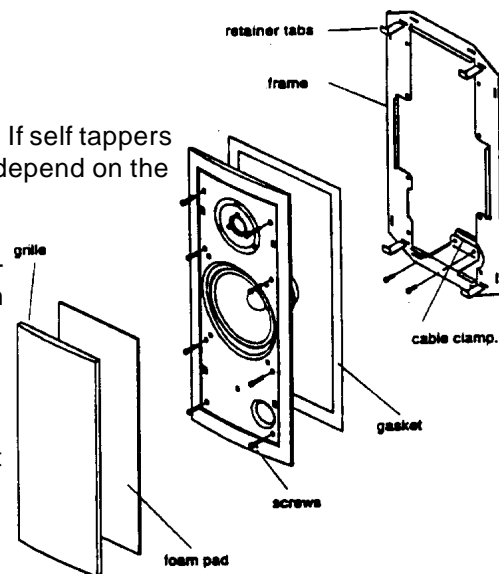
CHANGING COMPONENTS IN THE SEKRIT

**How to replace the treble unit.  
(LS7000 OnWall and LS6000 InWall)**

Treble units	LS7000 On Wall	SPKR 019/1
	LS6000 In Wall	SPKR 018/1

**Procedure:**

1. Remove the speaker baffle.  
(LS7000 On wall only- see section on previous page).
2. Pull off the speaker wire "push-on" connectors from the treble unit.
3. Turn the speaker the other way up and undo the three treble unit screws holding the treble unit to the front baffle.
4. Remove the treble unit.
5. Fit the new treble unit and gasket.
6. If a clamping ring is used, fit M4 screws, If self tappers are used refit the old screws (This will depend on the age of the speaker.)
7. Reconnect the electrical "push-on" connections, red to the terminal marked with a red dot (+).
8. Refit the cabinet using the 8 M4 screws.
9. Refit the socket collars and the front Grille.



**How to replace the crossover.  
(LS7000 OnWall and LS6000 InWall)**

Parts required:

1 x crossover.	LS7000 On Wall	: PCAS 179/PT
	LS6000 In Wall	: PCAS 178/PT

**Procedure:**

1. Remove the speaker baffle.  
(LS7000 On wall only- see section on previous page).
2. Pull off the speaker wire "push-on" connectors from the drive units on the crossover , note that these are identified on the crossover.
3. Unscrew the central fixing screw and washer.(In wall only)
4. Remove the crossover.
5. Fit the new crossover using the "black gunge" (from the old crossover) on the supporting posts to prevent buzzing.
6. Replace the central screw. (In wall only)
7. Reconnect leads - red wire to red terminals and reconnect electrical connections.
8. Refit the cabinet to the baffle using the 8 M4 screws.
9. Refit the socket collars and the front Grille.

SEALING SPEAKERS

**Estimated Time  
required: 20 minutes**

**TO SEAL A LOUDSPEAKER****Tools Required**

No. 2 pozidrive screwdriver	5 mm allen key
2.5 mm allen key for treble unit	M5 nut runner
4 mm allen keys for bass unit	4BA nut runner (for older DMS)
Solder (Linn type if possible)	
Heavy duty (50 - 100 W) soldering iron with heavy duty soldering bit	
Wide blade 3" - 4" (70-100mm) paint stripper (for old Index)	
PVA wood glue	Silicone sealer with hand dispenser

**Test Gear**

Signal generator set at 10 - 20 Hz  
Power amplifier  
Multi-meter (set to AC volts)

**Sealed or Ported?**

Linn produce two types of speakers, sealed (infinite baffle) like the Keltik, and ported enclosures like the Tukan

**Infinite Baffle:**

These are sealed enclosures which should be as airtight as possible. Any air leaks will result in a poor performance. The air seal also provides damping for the units and slightly increases the power handling.

It is therefore important that the cabinet is airtight. Over the years we have improved the seal in our loudspeakers, for example, by using better materials and coating the insides of the cabinet with special paints which both deaden and seal the cabinets, or by improving the laminations and laminating both sides of the cabinet walls.

**Leaky Loudspeaker**

It can be very difficult to find out where a speaker is leaking and you may prefer to return the speaker to Linn for checking and repair. However, there are some things you can try first.

**Procedure**

Set up signal generator 10 - 20 Hz drive, and drive speaker with no more than 6 V A/C for short bursts of no more than 10 to 15 seconds. Use Multi-meter to set voltage before connecting to speaker. Check for air leaks around the cabinet, baffle and units by feeling around the edges and joints with the back of your hand. If you cannot find any leaks, remember that your face is more sensitive to air movement. Alternatively use a stethoscope to "listen" for leaks.

**Instructions for Sealing:**

1. Faulty Unit: Check unit surrounds are sealed to unit chassis. Sometimes the rubber can become detached. The only proper solution is to replace the unit. Re-gluing rubber to chassis is rarely successful.
2. Cabinet Leaks: Either remove the units and apply glue to seams of cabinet from inside speaker, or seal from outside. Remember to wipe off excess glue. Leave to dry before auditioning.

**TO SEAL A LOUDSPEAKER (continued)**

3. Leak around the Unit (silicone sealed): Remove unit. Clean off old sealant and reapply silicone sealer. Ensure you use enough to seal the unit.

Leak around the Unit (gasket sealed): Remove unit, check gasket is not damaged and is in place. Clean off any swarf or dirt which may be present. If in doubt, fit a new gasket. You should be able to fit this over the lip of the unit without de-soldering the unit. Replace unit and tighten screws. Re-check for leaks .

**SIMPLE SPEAKER PHASING TEST**

Using a dc or DC source (battery) of approximately 1 volt and connecting the positive terminal of the battery to the positive speaker terminal and the negative terminal to the negative speaker terminal, here are the results you would achieve:

Keltik	Mid range moves outwards Bass unit moves outwards
Kaber	Mid / Bass unit moves outwards Bass unit moves outwards
Keildh	below serial number 15,400: Both Bass units move inwards above serial number 15,400: Both Bass units move outwards
Tukan	Bass unit moves outwards
Sekrit	Bass unit moves outwards

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Index II	Bass unit moves outward
Index Plus	Bass moves inwards
Kan	Bass moves inwards
Helix	Bass unit moves outwards
Nexus	Bass unit moves outwards
Sara (old)	Bass moves inwards
Sara 9	Bass moves outwards
DMS	Bass moves outwards Midrange moves inwards

The treble units also move, but it is impossible to see. If phase is suspect, the speaker must be dismantled and wiring checked. If in doubt, contact the factory or your distributor.

NEW SPEAKER GRILLES

**FITTING INSTRUCTIONS FOR NEW SPEAKER GRILLES**

Linn part numbers :    **LS300 GR KIT** for KEILIDH  
                                   **LS500 GR KIT** for KABER  
                                   **LS1000 GR KIT** for KELTIK

Please note that the new Grille has no corners.

**To fit the Grille:**

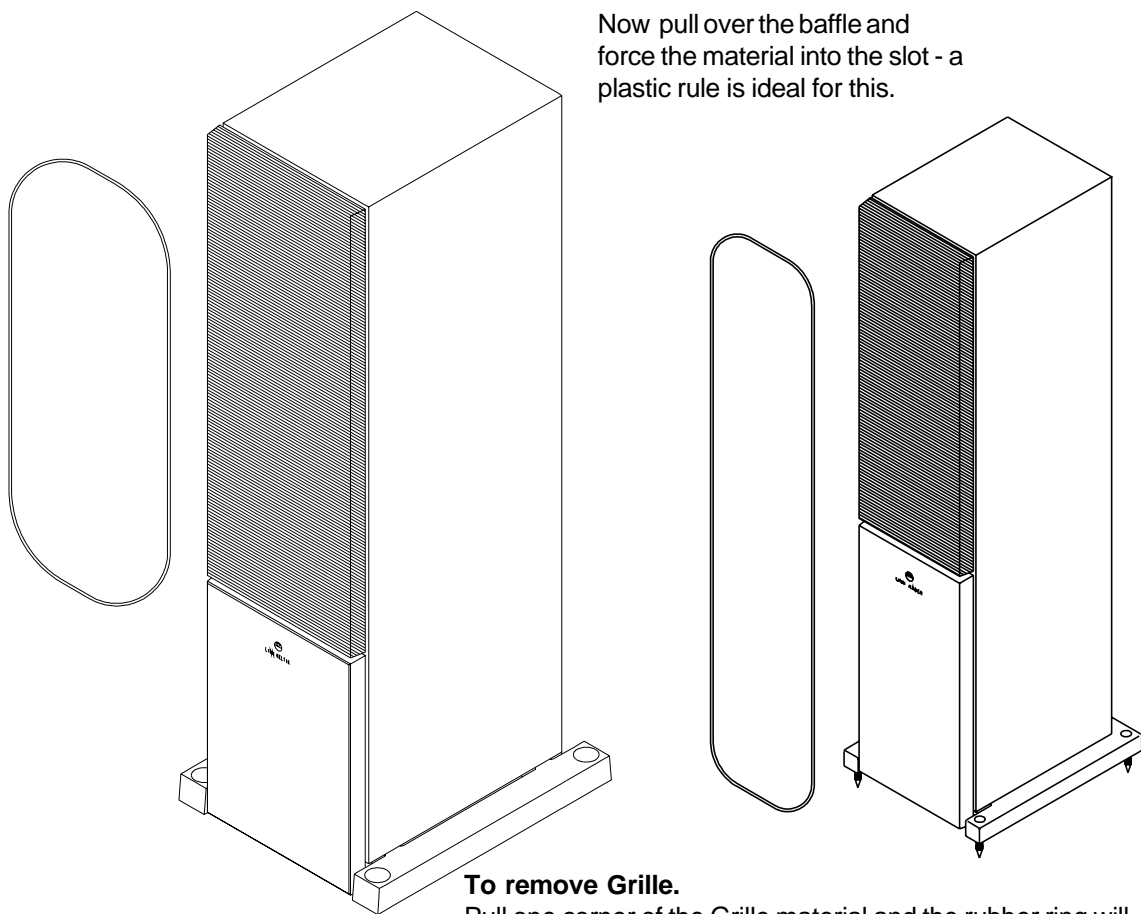
1. Locate the join in the elastic and fit this into the groove beneath the top baffle, with the shiny side of the material to the outside.
2. Stretch the Grille over the baffle, locating the elastic in the slot behind the baffle.

**To fit the rubber ring:  
 KELTIK**

Find the join and locate this in the groove beneath the **top** baffle. It may help to stretch this slightly when initially locating it.

**KEILIDH AND KABER**

Find the join and locate this in the groove beneath the **bottom** baffle. It may help to stretch this slightly when initially locating



Now pull over the baffle and force the material into the slot - a plastic rule is ideal for this.

**To remove Grille.**

Pull one corner of the Grille material and the rubber ring will come out of the slot. Remove the ring first then the Grille.

**FITTING INSTRUCTIONS FOR NEW FULL SPEAKER GRILLES**

Linn part numbers :   LS1000 GR KITL for KELITK  
                              LS300 GR KIT/L for KEILIDH  
                              LS500 GR KIT/L for KABER

Please note that the new Grille has no corners.

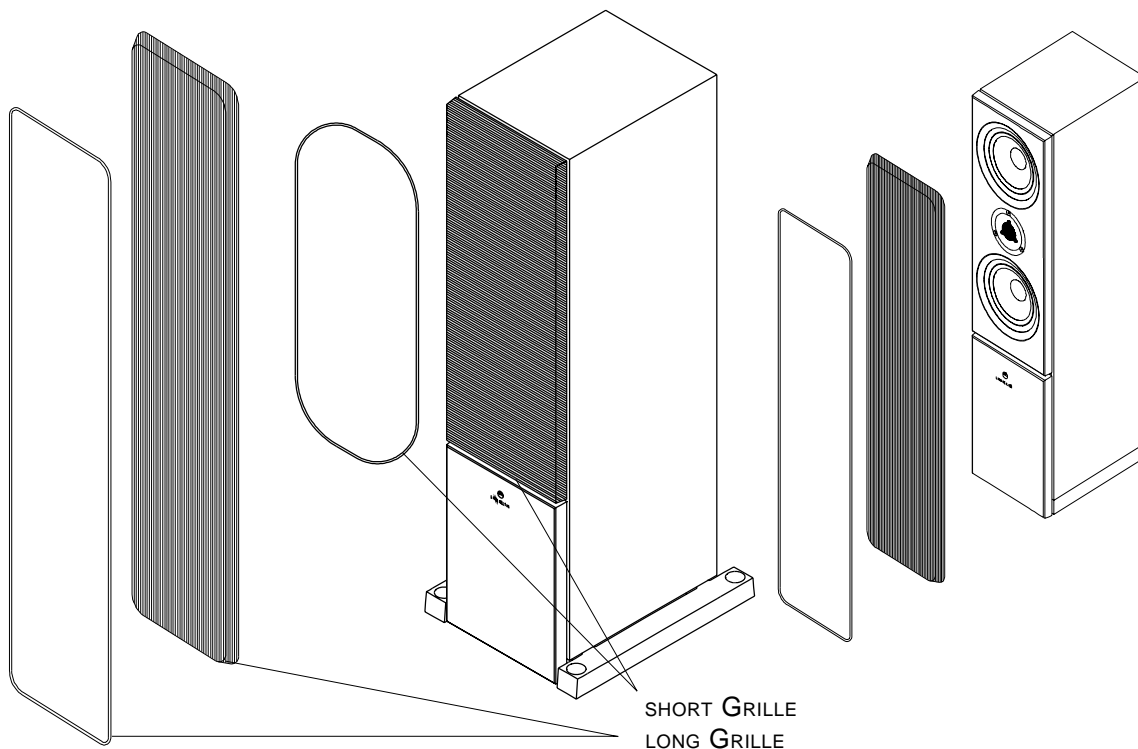
To fit the Grille:

1. Locate the join in the elastic and fit this into the groove beneath the top baffle, with the shiny side of the material to the outside.
2. Stretch the Grille over the baffle, locating the elastic in the slot behind the baffle.

To fit the rubber ring:

**KELITK, KEILIDH, KABER AND TUKAN**

1. Find the join and locate this in the groove beneath the *bottom* baffle. It may help to stretch this slightly when initially locating it.
2. Now pull over the baffle and force the material into the slot - a plastic rule is ideal for this.



**To remove Grille.**

Pull one corner of the Grille material and the rubber ring will come out of the slot. Remove the ring first then the Grille.

REDUCING THE TREBLE BY 1DB**PROCEDURE ON HOW TO REDUCE THE TREBLE BY 1 dB**

**Estimated Time  
Required: 30 minutes.**

This procedure is the similar for KEILIDH, TUKAN, CENTRIK. The SEKRITE procedure is also similar once you gain access to the crossover, see 6.18 on removing the baffle. All crossovers also have instructions on them describing the required steps.

**TOOLS REQUIRED:**

2.5 MM Allen key (Hex key)

Small pair side cutters.


Silicone sealer and dispenser. ( Where required, see 2 below)

Temperature controlled Soldering Iron and Multicore solder.

**PROCEDURE**

1. Place one speaker on its back and carefully remove the bass unit trim rings.
2. Remove the silicone that may be between the unit and the cabinet. This is best done by rubbing it off with your finger. Be careful not to damage the surround of the unit.  
Please note: Later cabinets do not use silicone, trim ring is held in place by locating in a groove in the baffle
3. Remove the 4 bolts that secure the bass unit to the cabinet
4. Lift the unit out of the cabinet and un-solder\* the wires from the crossover. Place **carefully** to one side. \*Alternative is to leave it soldered but support the unit when you move the speaker, to avoid cabinet or unit damage.
5. Stand speaker upright and remove the collars from the back of the speaker. KEILIDH: Do not loose the 2 blanking discs from the Aktiv bass sockets.
6. Remove the wadding from the speaker and lift the crossover off the back of the speaker.

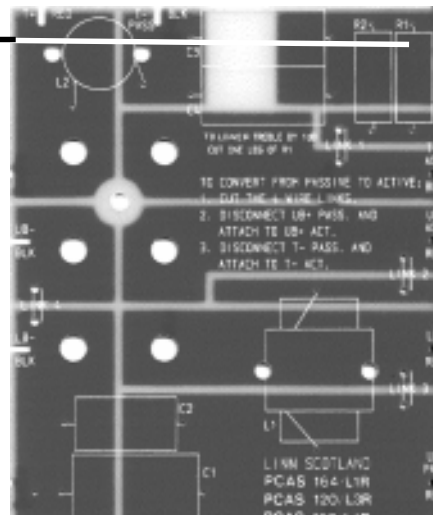
7. Locate resistor normally R1(see board)

on the crossover.  Cut and lift one leg of resistor clear from board, bending it back to ensure that it cannot short. Do not cut both in case you wish to connect it back. KEILIDH NOTE: Speakers over serial number 21,000 will have the resistor located on the left side of the board.

8. Replace the crossover on to the back panel and secure in place using the speaker socket collars. Make sure that the treble input is at the top!

9. Replace the wadding then solder (if required, see 4 above) the wires back on to the bass unit terminals, red wire to red terminal. Refit the gasket and screw the unit in place. Repeat whole procedure with other speaker.

10. Now carry out listening test and if satisfied with the result secure the trim ring back in place with silicone (where required, see 2). **Caution:** Use silicone sparingly and avoid getting it on to the surround of the unit.

**KEILIDH LS 300 :**

**KABER LS 500:**

**Converting Passive KABER Loudspeakers to Aktiv:**

Estimated Time required: 30minutes
---------------------------------------

This is a simple procedure which requires the removal of the passive crossovers complete with back panel and the fitting of a new back panel, complete with speaker sockets.

**Parts required:**

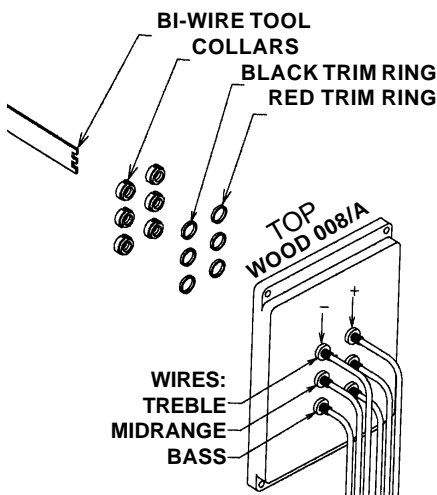
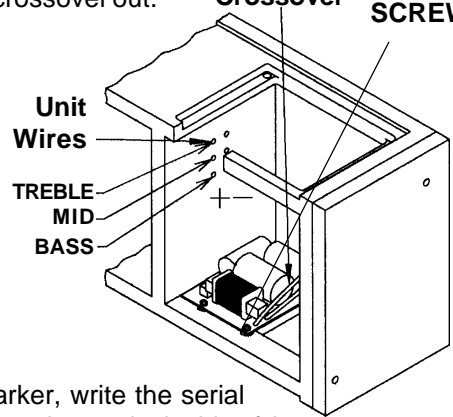
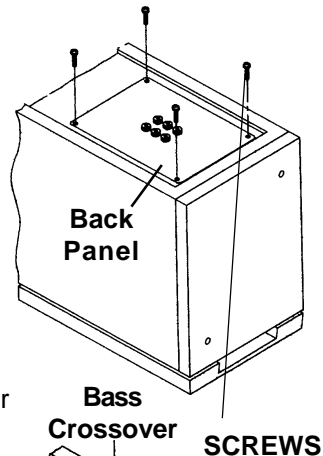
- 2 x Wood 008/A Back panel
- 1 x MCP 800 Set Speaker sockets and collars

**Tools Required:**

- No. 2 pozidrive screwdriver Collar bi-wiring tool
- 1 pair side cutters Solder
- Soldering iron, temperature controlled 25 - 100 W
- Felt Marker
- Last but not least: A suitably protected, **clean** work bench.

**Procedure:**

1. Place the speaker carefully on its front on the **clean, protected** work bench. Remove back panel securing screws and lift out the back panel complete with crossover board.
2. Cut the speaker unit wires **close** to the board at the Treble/Mid crossover (the one behind the back panel) .
3. Remove Speaker wadding and locate the Bass crossover and remove the 4 fixing screws, then lift the crossover out.
5. Cut the Bass unit wires at the **CROSSOVER** end, **close** to the board.
6. Fit the New speaker sockets to the New back panel.
7. Identify the wires according to the drawing and solder the wires direct on to the speaker sockets.



8. Using a felt marker, write the serial number of the speaker on the inside of the new back panel and refit to the speaker using the 4 screws.
9. Carefully remove the serial number label off the old panel and fit to the new panel. If the label is no longer sticky use a new label, as the original serial number **MUST** be attached to the speaker.
10. Check the wiring:

Safest way is to use the treble amplifier output into each socket at low volume first to verify that wiring is correct. Once satisfied that the wiring is correct, connect mid and bass speaker wires and then audition.

11. Clean and re-pack speaker for customer



CONVERTING KEILIDH TO AKTIV.**KEILIDH LS 300 :  
PROCEDURE ON HOW TO CONVERT TO AKTIV.**Estimated Time  
required: 30minutes**History: Please read carefully before proceeding with conversion.**

The crossover used in the KEILIDH is a 2nd order crossover (which means that the treble is out of phase to the bass unit) This applies to all KEILIDHs Due to a screen printing error on the crossover on the original speakers the total (Absolute) phase was reversed. When this was noticed the wiring was corrected immediately with the result that the writing on the crossover was then misleading, so that when the treble wire connections read:

“T-RED” but had the **black** wire and

“T-BLK” had the **red** wire connected.

This can be confusing should any one look at the crossover screen printing!

The final stage in this correction was to change the screen printing so now the wiring and the screen printing are both correct.

End result: The bass unit is in phase with the input signal and  
the treble unit out of phase to the input signal and the bass unit,  
**ABSOLUTE PHASE IS NOW CORRECT.**

Approximate serial numbers :

Original introduced: September 1992

Change to wiring: Nov 93 to June 1994 Sn 15,400 to 21,000

Change Crossover board: June 1994 21,000 onwards (approx.)

**NOTE: When using KEILDHS in Surround Sound applications (or using with other speakers in one room), KEILIDHs below sn 15,400 should be wired with the POSITIVE [+] speaker wire to the negative [-] ve speaker terminal so that ABSOLUTE PHASE is correct. If in doubt check the phase, page 6.19**

The procedure to convert to Aktiv remains the same for all KEILIDHs, but you should refer to the specific drawing on the following three pages for clarification on the wiring

**Tools Required:**

2.5 MM Allen key (Hex key)

Small pair side cutters.

Silicone sealer and dispenser. ( Where required, see 2 below)

Temperature controlled Soldering Iron and Multi-core solder.

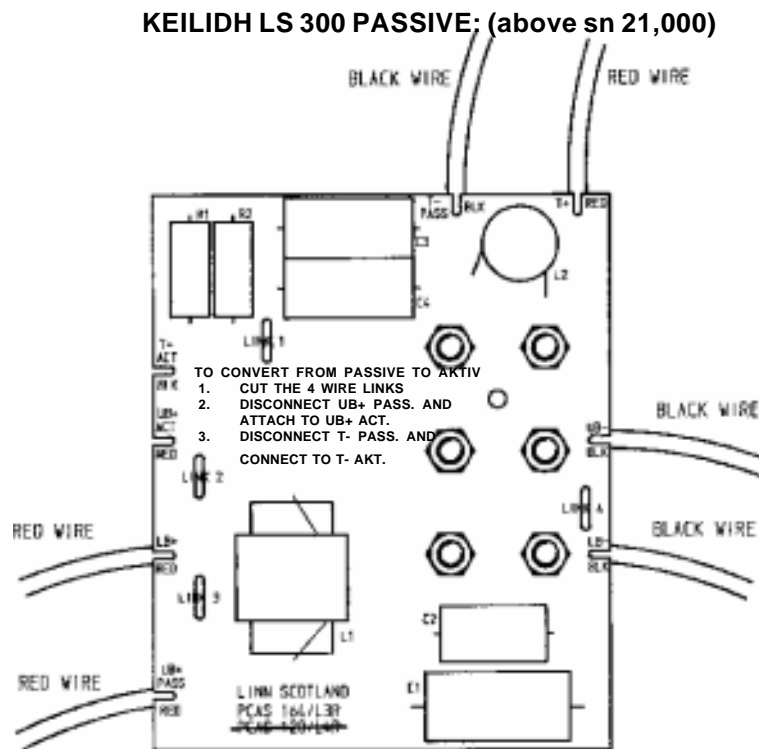
**Procedure**

1. Place one KEILIDH on its back and carefully remove the lower bass unit trim rings.
2. Remove the silicone that may be between the unit and the cabinet. This is best done by rubbing it off with your finger. Be careful not to damage the surround of the unit. Please note: Later cabinets do not use silicone, trim ring is held in place by locating in a groove in the baffle
3. Remove the 4 bolts that secure the lower bass unit to the cabinet
4. Lift the unit out of the cabinet and \*un-solder the wires at the speaker terminals from the crossover. Place **carefully** to one side. \*NOTE: A short-cut is to leave the unit soldered but be careful that you hold the unit when moving the cabinet to prevent it hitting the cabinet and causing damage.

**PROCEDURE ON HOW CONVERT TO AKTIV. (continued)**

5. Stand speaker upright and remove the 6 collars from the back of the speaker. Retain the 2 blanking discs from the Aktiv bass sockets.
6. Remove the wadding from the speaker and lift the crossover off the back of the speaker.
7. Locate and cut the 4 links, (see drawing on next page) bending them back to ensure that they cannot short. Do not remove in case you wish to connect it back.
8. Disconnect Upper Bass passive + (UB+) and solder to UB +ACT.
9. Unsolder T- PASS and solder to T- ACT.
10. Refit the crossover on to the back panel and secure in place using the speaker socket collars. Make sure that the treble input is at the top!
11. Replace the speaker wadding then solder \* the wires back on to the bass unit terminals, red wire to red terminal. Refit the sealing gasket and screw the bass unit in place. Repeat whole procedure with other speaker. (\*See note point 4)
12. Now carry out listening test before securing the trim ring back in place with silicone (where used).

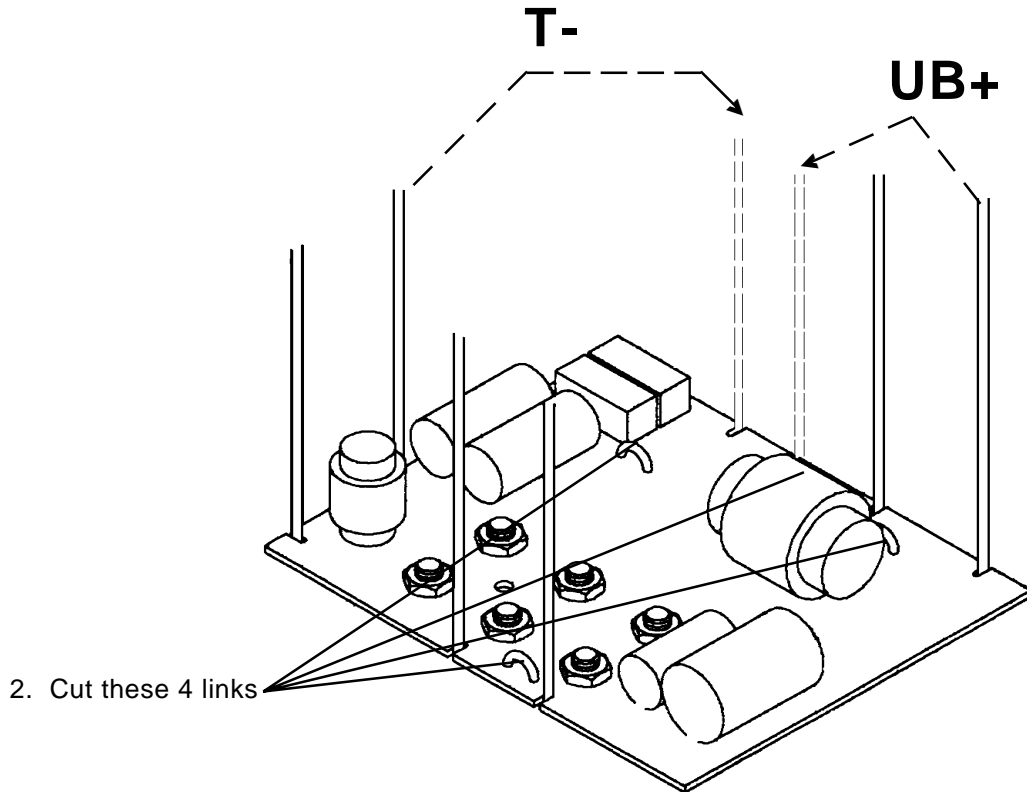
**Caution: Use silicone sparingly and avoid getting it on to the surround of the unit.**



CONVERTING KEILIDH TO AKTIV.

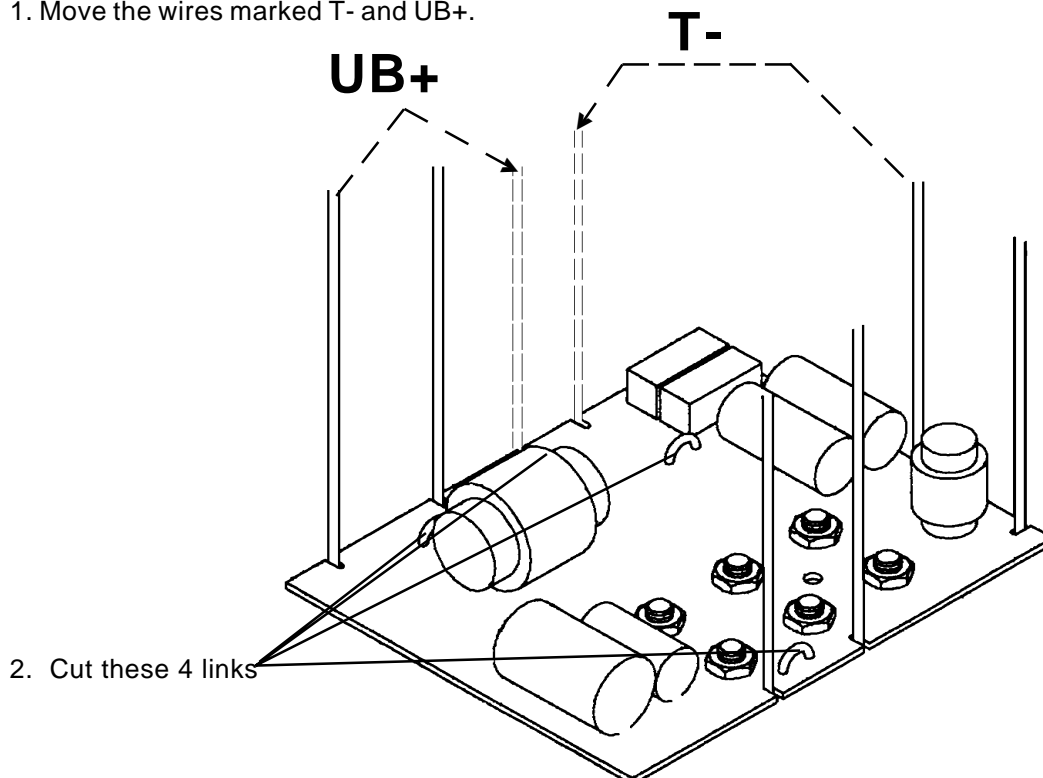
**KEILIDH LS 300 PASSIVE: (below sn 21,000)**

1. Move the wires marked T- and UB+.



**KEILIDH LS 300 PASSIVE: (Above sn 21,000)**

1. Move the wires marked T- and UB+.



**TUKAN LS 300 :  
PROCEDURE ON HOW TO CONVERT TO AKTIV.**

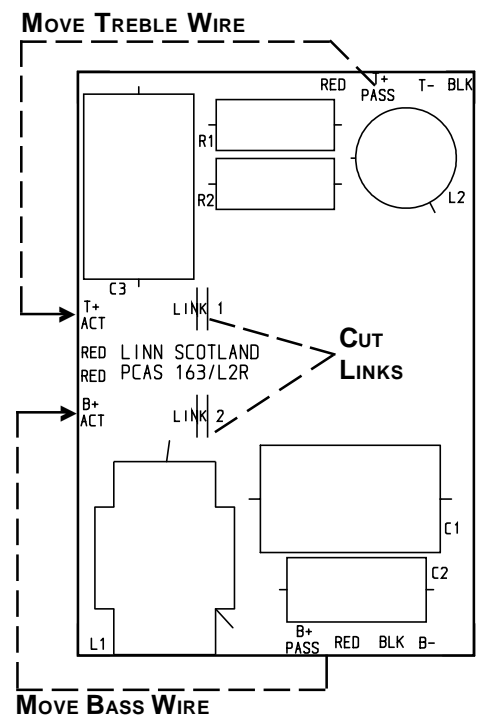
**Estimated Time  
required: 30minutes**

**Tools Required:**

- 3 MM Allen key (Hex key)
- Small pair side cutters.
- Temperature controlled Soldering Iron and Multi-core solder.
- Double sided adhesive tape

**Procedure**

1. Place one TUKAN on its back and carefully remove the lower bass unit trim rings.  
NOTE: Early TUKANs used double sided tape to secure the trim ring, on later TUKANs the trim ring is held in place by locating in a groove in the baffle.
2. Remove the 4 bolts that secure the lower bass unit to the cabinet
3. Lift the unit out of the cabinet and \*un-solder the wires at the speaker terminals from the crossover. Place **carefully** to one side. \*NOTE: A short-cut is to leave the unit soldered but be careful that you hold the unit when moving the cabinet to prevent it hitting the cabinet and causing damage.
4. Stand speaker upright and remove the 4 collars from the back of the speaker.
5. Remove the wadding from the speaker and lift the crossover out of the speaker.
6. Locate and cut the 2 links, (see drawing) bending them back to ensure that they cannot short. Do not remove in case you wish to connect it back.
7. Unsolder the red "Bass (B+) PASS" wire and solder to "B +ACT".
8. Unsolder the red "T- PASS" and solder to "T- ACT".
9. Refit the crossover on to the back panel and secure in place using the speaker socket collars. Make sure that the treble input is at the top!
10. Replace the speaker wadding then solder\* the wires back on to the bass unit terminals, red wire to red terminal. Refit the sealing gasket and screw the bass unit in place. (\*See point 3)
11. Repeat whole procedure with other speaker.
12. Now carry out listening test before securing the trim ring back in place the way it was, using the lugs, or if early Tukan use double sided tape.



CONVERTING SEKRITE TO AKTIV.

**SEKRIT LS (On and In-Wall)  
PROCEDURE ON HOW TO CONVERT TO AKTIV.**

**Estimated Time  
required: 30minutes**

**Tools Required:**

- 3 mm Allen key (Hex key) supplied with speaker.
- Small pair side cutters.
- Temperature controlled Soldering Iron and Multi-core solder.

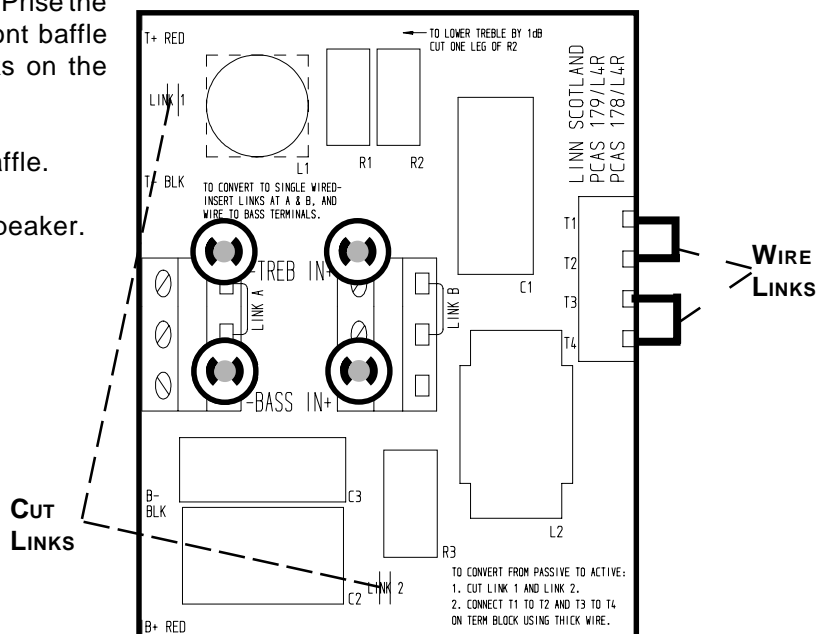
**Procedure**

1. Remove the Sekrit from the wall (or floor stand, LS7000 only).
2. Put the speaker carefully on it front on a clean, protected table/workbench.
3. **LS 6000 IN-WALL:** go to step 7. **LS 7000 ON-WALL :** Remove baffle: Remove the 4 speaker input collars using the special tool provided with the speaker.
4. Turn the speaker to other way up and remove the GRILLE and foam insert using a small pointed object.
5. Remove the 8 retaining bolts from the front of the baffle, taking care not to remove the unit screws.
6. Put the speaker on its front and remove the cabinet from the baffle..
7. Locate and cut the two links on the crossover, (see drawing ) bending them back to ensure that they cannot short. Do not remove in case you wish to connect it back.
8. Connect T1 to T2 and T3 to T4 with wire links:

**LS 6000 IN-WALL:** Screw the wire links into the terminal block as shown

**LS 7000 ON-WALL:** Prise the crossover off the front baffle and solder the links on the back as shown.

9. Refit the speaker baffle.
10. Repeat with other speaker.



Estimated Time Required: 20 minutes
--

**KEILIDH:  
PROCEDURE FOR REPLACING FAULTY  
STAND INSERT**

**TOOLS REQUIRED:**

- 2.5 mm Allen key (Hex key)
- You may need an Electric drill with tungsten M5 drill bits.

**PARTS REQUIRED:**

1. "T Nut " insert
2. Threaded rod (as for Kustone stand)
3. M5 bolt and Allen key (Hex key)
4. Spacer / washers (M5 mudguard washers or similar)

**PROCEDURE:**

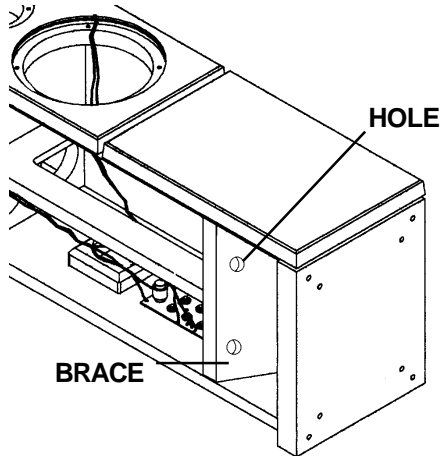
1. Place the KEILIDH on its back and carefully remove the lower bass unit trim ring.
2. Remove the silicone that **may be** between the unit and the cabinet. This is best done by rubbing it off with your finger. Be careful not to damage the surround of the unit.  
Please note: Later cabinets do not use silicone, trim ring is held in place by locating in a groove in the baffle
3. Remove the 4 bolts that secure the lower bass unit to the cabinet
4. Lift the bass unit out of the cabinet and place **carefully** on the speaker, you may wish to put a soft cloth under the unit to protect the speaker front.
5. Remove the speaker wadding noting how it is placed in the cabinet (as you will need to put it back in the same way) and put to one side.
6. Remove the faulty insert from the base of the cabinet. If the insert is loose in the bottom of the cabinet, magnetise the threaded rod by stroking the speaker magnet with it a few times, then use it to fish the insert out. If the bolt and insert are stuck in the cabinet you will need to remove them. Either unscrew the stand bolt while levering the insert tight by using the stand or wooden base against the cabinet, (Do not lever against the edge of the cabinet as you will damage the bottom of the speaker) or drill out the old screw. You will need a good sharp tungsten metal drill bit as the bolts are tensile steel.
7. Take the threaded rod and screw the insert on about half way on one end as shown below.



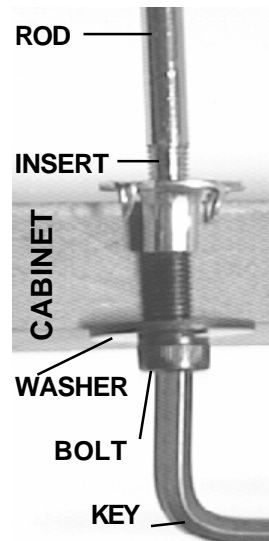
KEILIDH: REPLACING STAND INSERT

**PROCEDURE (continued):**

8. Feed the rod and insert through the hole on the internal brace and locate the insert in the mounting hole.



8. Thread a 5 mm Allen bolt (Tonearm collar screw) with a washer into the insert a couple of turns, then start to tighten, while unscrewing the rod from the insert. Continue until the rod is fully unscrewed from the insert, then remove the rod from the speaker.



9. Tighten the bolt until the insert is tight and fully home.

10. Fit the stand base using all 4 bolts to ensure that there are no other faults.

11. Replace the speaker wadding as you found it. Refit the speaker unit and trim ring.  
If Trim ring was fitted with silicone, use new silicone to secure in place - Avoid getting silicone on to the unit surround.

12. Audition.

POLYMER COMPOSITE STANDS

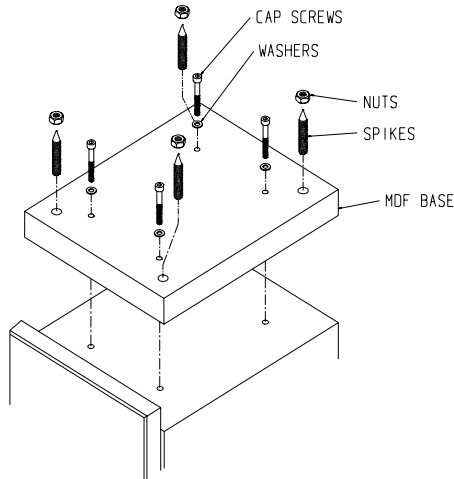
**GENERAL INFORMATION** These stands will seriously improve the performance of the loudspeakers. They are rigid, heavy and non-resonant, and the large footprint ensures stability.

**CARE** Clean the stands by wiping with a damp cloth. If the stands are hit hard or dropped then they may fracture.

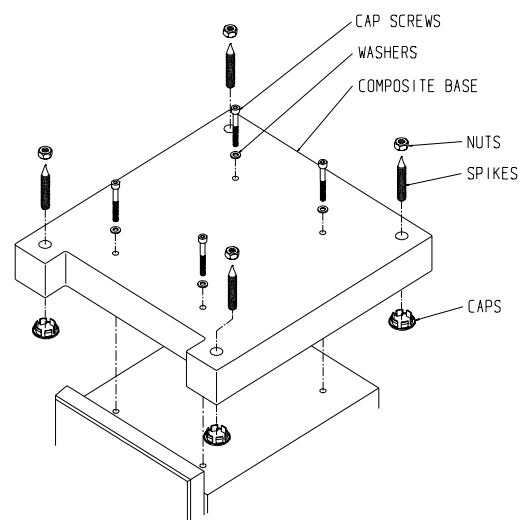
**INSTALLATION**

1. Turn the power off and disconnect the loudspeakers.
2. Stand the speakers on a soft surface with the existing base uppermost. Take care not to hurt yourself on the spikes! Loosen the lock nuts and remove the spikes. Unscrew the 4 bolts holding the existing base with the M4 Allen key.
3. Remove the existing base.
4. Remove any loose dust and place the base on to the speaker.
5. Screw the new base onto the loudspeaker with the 4 bolts, using a washer under the head of each bolt. **Be careful not to push down on the "T nuts"**.
6. Locate all the screws finger tight into position before you fit the floor spikes into the stand base as they were fitted to the original stands, leaving everything finger tight for the moment.
7. Reposition the loudspeakers and confirm that the speakers are in the best position by trial and error, taking care not to hurt yourself on the spikes, or allow the spikes to damage any cables.
8. Adjust the spikes so that the speakers cannot rock, and tighten up the lock nuts.
9. Fit the dust caps to cover the spike holes. Reconnect the speakers to the hi-fi system.

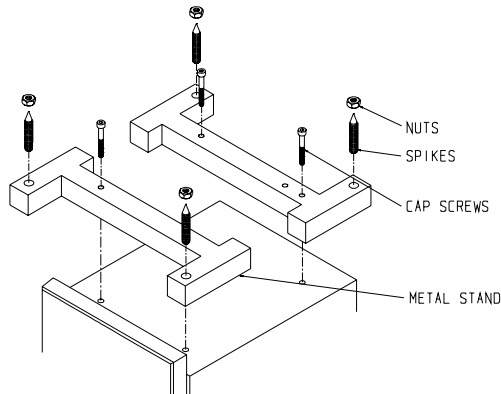
REMOVING EXISTING BASE FROM KEILIDHS



FITTING THE NEW BASE TO KEILIDHS OR KABERS



REMOVING EXISTING BASE FROM KABERS





MODIFYING HELIX & NEXUS FOR KUSTONE STANDS**TO MODIFY OLD HELIX AND NEXUS TO  
INCORPORATE KUSTONE STANDS**

(WITHOUT TOP PLATE)

**Estimated Time  
of Completion for  
this task ~  
30 minutes**

Only required for Helix prior to serial number 10,559/600

Only required for Nexus prior to serial number 19,487/8

**Tools Required:**

No. 2 pozidrive screwdriver

M4 allen hex key

Soldering iron 50 - 100 W (temperature controlled)

Solder

Drill with 7 mm bit

M5 screw (short arm collar screw)

5 mudguard washers (LP12 kit)

**Components Required:**

4 x M5x12 inserts

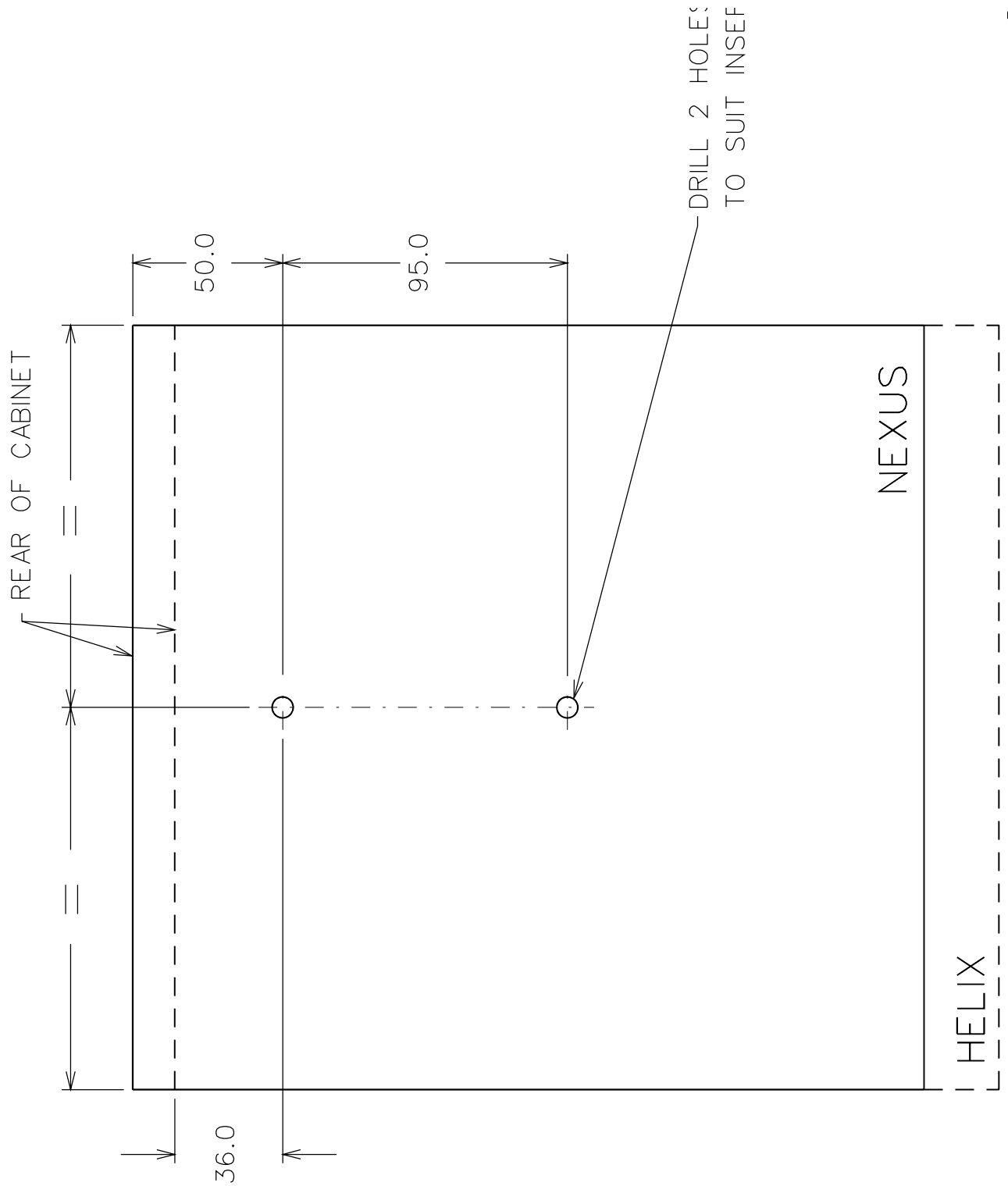
4 x M5 washers

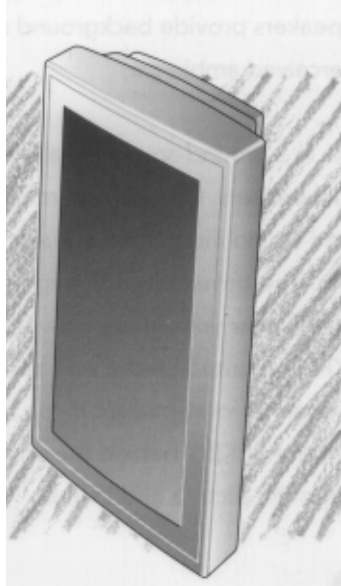
Template

**Instructions:**

1. Clean work area/bench of anything that might damage the cabinet. Remember wood is easily marked - protect cabinet from bench, tools, loose screws etc.
2. Check that inserts will thread properly on Kustone rods.
3. Remove trim ring (or fascia) from bass unit of speaker and remove bass fixing screws.
4. Lift out and de-solder bass unit. Place to one side in a safe place along with rubber gasket.
5. Place speaker upside down on a clean, soft surface or bench mat.
6. Locate template on speaker and mark centre of holes.
7. Drill holes with 7 mm drill.
8. Remove side of foam pad inside speaker to gain access to bottom enclosure of speaker. Place washer on the insert and locate in hole from inside the cabinet.
9. Use Ittok/Ekos arm collar screw (M5) and five mudguard washers to pull into place. Tighten until insert is fully located. Check washer fitted inside cabinet does not turn. Reglue side of foam inside cabinet.
10. Re-assemble speaker, soldering wires to unit and securing in position.
11. Re-attach fascia or trim ring (glue in place with silicone sealer).
12. Carry out modification for the other loudspeaker.
13. Fit stands and audition loudspeakers.

MODIFYING HELIX & NEXUS FOR KUSTONE STANDS



SEKRIT IN- & ON-WALL**SEKRIT LOUDSPEAKERS**LS7000 ON WALL**INTRODUCTION**

The SEKRIT IN-WALL combines practicality, performance and style, allowing high quality audio to be produced whilst remaining virtually invisible by being concealed in a plasterboard/wood construction partition wall. The SEKRIT

ON-WALL can be used on Floor stands or can simply be hung from picture hooks on the wall. The BRAKIT is recommended as a better way of attaching to the wall ensuring both safety and improved sound performance. Both SEKRIT loudspeakers are suitable either for use in the primary listening room, a secondary room as part of a multi-room system, or as front or rear loudspeakers in a surround sound system.



The full Linn upgrade path is possible, each stage providing a notable improvement in acoustic performance, from bi-wiring through bi-amping to full active. The SEKRIT loudspeakers have been built to last, and designed to be easily serviced, and they will give many years of listening pleasure.

**GRILLES**

The SEKRIT is fitted with a perforated steel Grille designed to have the minimum influence on sound quality. The Grille and outside frame of the front baffle can be spray painted to any colour whilst using the cardboard cover to protect the drive units. For full instructions consult the INSTALLATION MANUAL. The Grille is removed by prising it off with a sharp implement inserted into one edge. Once removed, take care not to touch the drive units - in particular the small high frequency unit - or permanent damage will result.

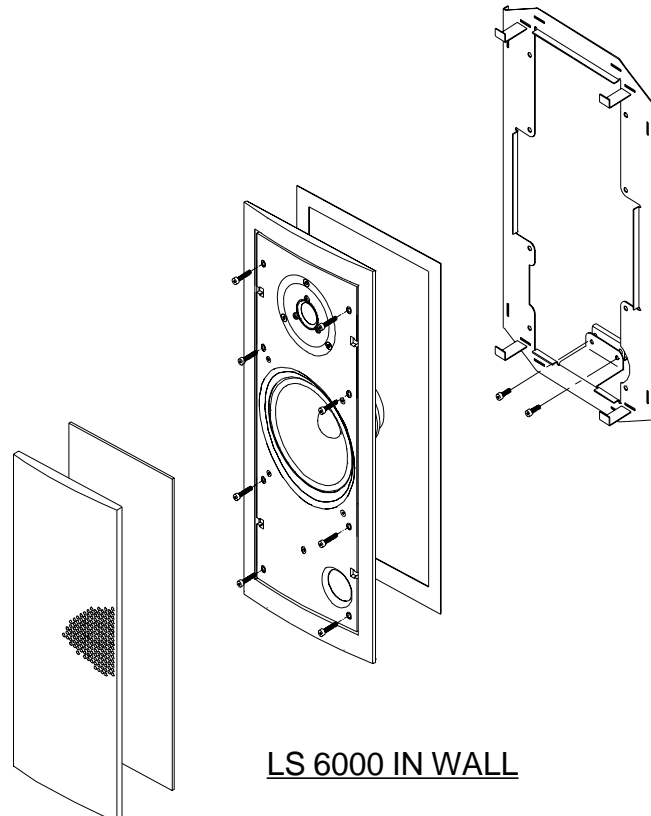
**TECHNICAL NOTE**

The SEKRITs use a custom designed 25mm diaphragm **metal domed tweeter**, specially designed for the SEKRIT. It has a particularly low resonant frequency, allowing a low crossover point to be used. This gives the loudspeaker excellent dispersion in the mid-frequency band which helps to project the sound away from the wall. The result is clearer vocals and a more detailed sound.

**The bass/mid driver** used in the SEKRIT is also custom designed and so optimised for this application. It has a rigid diecast chassis which increases the stiffness of the baffle, a mineral filled polypropylene cone with well controlled break-up modes and a precision magnet assembly. The SEKRIT has an exceptionally high voltage sensitivity of 90dB/W/m (2.83 Vrms), allowing lower powered amplifiers to produce an impressive sound. High temperature glues and an aluminium voice-coil bobbin give this unit high power handling appropriate to the output levels of most domestic amplifiers.

**The crossover** used in the SEKRIT is a 2nd order electrical response type for treble and bass. The bass section has impedance compensation so that the impedance presented to the amplifier is resistive over a large part of the audio band. A resistive load creates less heating effect in the amplifier and reduces the peak currents in the loudspeaker cables. The inductors used in the crossover are wound with heavy gauge wire to reduce losses and the capacitors are high quality audio-grade components to preserve the signal.

**The baffle** is the same for both IN and ON WALL speakers so the procedure for removing the speaker units and crossovers is the same once the baffle is removed from the ON-WALL cabinet

LS 6000 IN WALL

LINN BRAKIT**LINN BRACKET FOR WALL MOUNTING****INTRODUCTION**

This bracket has been designed to be a very rigid and strong support that allows the speakers to give their best performance. The unique curved shape gives strength to the assembly and also offers flexibility of both vertical and horizontal adjustment. The loudspeakers can be angled to obtain the optimum listening axis. The speakers are held within 6cm of the wall and the mounting brackets are hidden behind the speakers.

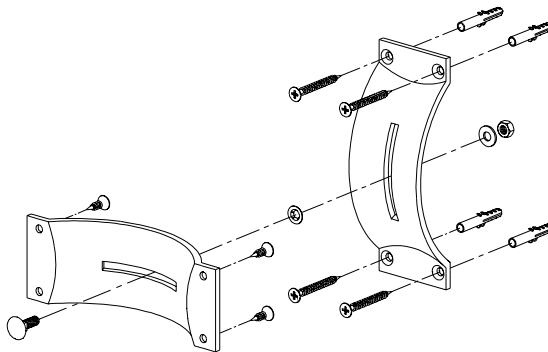
**TOOLS REQUIRED**

Spirit level  
Power Drill  
6mm masonry drill bit  
No2 Pozidriv screwdriver

**ASSEMBLY/INSTALLATION**

Before assembly you should check that the kit is complete. A complete kit consists of:

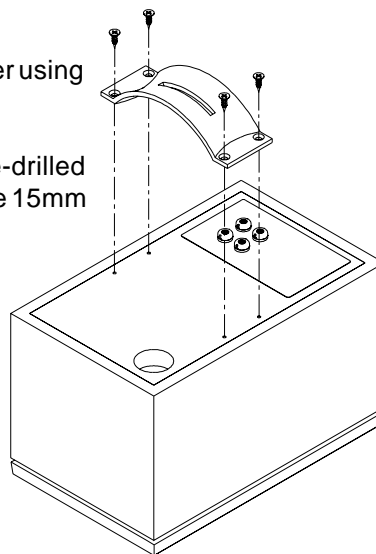
- 4 curved steel plates
- 8 wall plugs
- 8 long screws
- 8 short screws
- 2 plain washers
- 1 spanner/wrench
- 2 bolt retainers
- 2 bolts
- 2 nuts



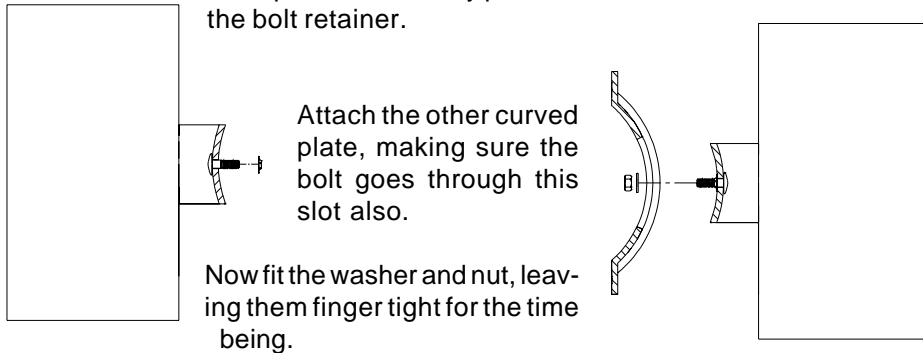
First screw a curved plate to the loudspeaker using 4 appropriate screws:

**TUKAN:** Use the 4 short screws into the pre-drilled holes. Note: These 3mm diameter holes are 15mm deep and do not break through into the cabinet. Also note the curved plates are identical to simplify the installation.

**SEKRIT:** Use the 4 M4 machine screws supplied with the SEKRIT.

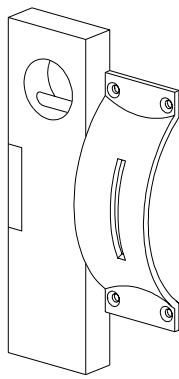


Now put the bolt through the slot on the curved plate attached to the loudspeaker and firmly push on the bolt retainer.



Attach the other curved plate, making sure the bolt goes through this slot also.

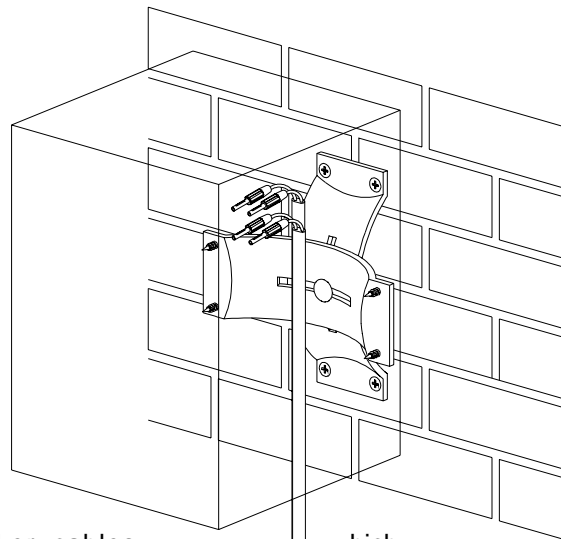
Now fit the washer and nut, leaving them finger tight for the time being.



Decide on the location of the loudspeakers and mark the wall at the edges of the steel plate. Remove the wall plate from the loudspeaker assembly and use it to mark the position for the holes in the wall, having first checked for vertical with a spirit level.

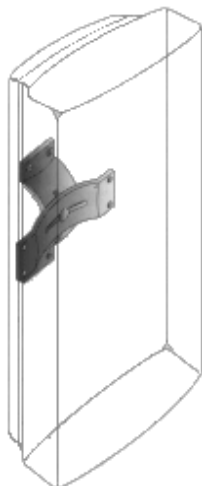
Now drill the holes in the wall at least 45mm deep. Insert the 4 plugs and screw the plate to the wall using 4 long screws.

Offer the loudspeaker to the plate on the wall making sure the bolt goes through the slot. Slip the washer over the end of the bolt and start the nut on the thread using your fingers.



Now connect the loudspeaker cables, which should be fed inside the curved plate on speaker for a tidy installation and to the nut. Finally tighten the assembly spanner supplied whilst holding the loudspeaker at the desired angle.

which the loudspeaker allow access using the speaker at angle.



TREBLE UPGRADE TO LOUDSPEAKERS**UPGRADE TO INDEX II, HELIX II, NEXUS AND KABER LOUDSPEAKERS**

Estimated Time  
required:  
**30 minutes**

The treble response of the following loudspeakers has been improved by changing resistor values on the treble crossover sections.

	Serial No. of Change
Index II	9339/40
Helix	13395/6
Nexus	24833/4
Kaber/1	6245/6

On the Nexus crossover the change is from 2.2 ohms to 2.7 ohm. The Helix has an additional resistor of 0.47 ohms. The Index II value changes from 2.2 ohms to 2.7 ohms and on the Kaber/1 from 2.7 ohms to 3.3 ohms.

These adjustments improve the balance which yields better results with a wider range of amplifiers and sources and gives better results in 'live' rooms.

**To Upgrade Index II Treble Response**

Applies to speakers prior to serial number 9339/40.

Requires a simple resistor change in the crossover, from 2R2 to 2R7.

**Tools Required:**

No. 2 pozidrive screwdriver  
Collar bi-wiring tool  
1 pair side cutters  
5 - 10 mm flat bladed screwdriver  
Soldering iron, temperature controlled 25 - 100 W  
Solder

**Components Required:**

2 x 2R7 ohm wire wound resistors Part No. RES 120

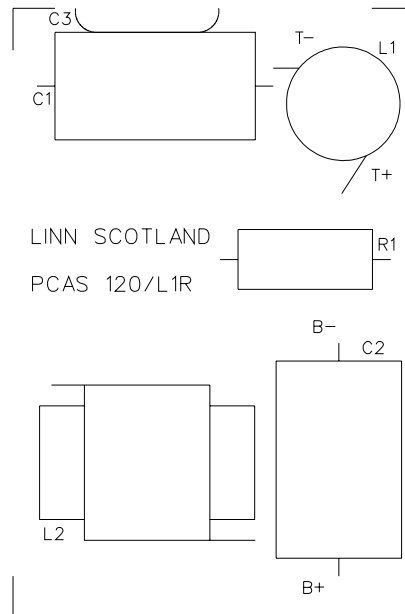
**Instructions:**

1. Remove collars from speaker sockets.
2. Remove speaker facia.
3. Remove screws securing bass unit.
4. Remove bass unit, un-solder wires and place to one side.  
NB: red wire to positive terminal.
5. Remove crossover securing screw.
6. Lift crossover out of speaker.
7. Snip legs of resistor R1 close to board (see drawing).

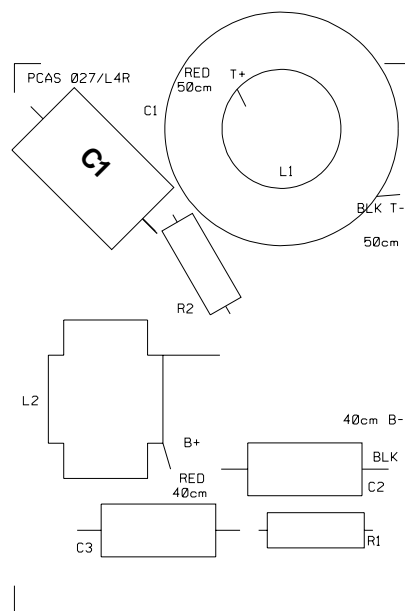
TREBLE UPGRADE TO LOUDSPEAKERS

8. Remove resistor from board, prise off using flatbladed screw driver.
9. Unsolder resistor legs and clear holes on pcb.
10. Fit new resistor, trim legs leaving approx. 5 to 7 mm. Bend legs over and solder in place. Glue resistor in place if possible using hot melt glue or clear impact glue.
11. Re-assemble speaker.
12. Audition speaker.
13. Clean and re-pack speaker for customer.

**INDEX LS120**



**HELIX LS150**





TREBLE UPGRADE TO HELIX**To Upgrade Helix II Treble Response**

Applies to Helix II prior to serial number 13395/6

Requires addition of a 0.47 ohm resistor (RES 309) in series with the treble capacitor.

**Tools Required:**

No. 2 pozidrive screwdriver

Collar bi-wiring tool

1 pair side cutters

5 - 10 mm flat bladed screwdriver

Soldering iron, temperature controlled 25 - 100 Watt

Solder

Components Required: 2 x 0.47 Ohm wire wound resistor Part No. Res 309

**Instructions:**

1. Remove fascia from speakers.
2. Remove screws securing bass unit.
3. Remove bass unit. Unsolder unit and place to one side. NB: Red wire to positive terminal.
4. Remove crossover securing screw.
5. Turn speaker over and remove collars from speaker sockets. Using Number 2 screwdriver, tap speaker socket to free crossover from cabinet.
6. Remove crossover from speaker.
7. Locate leg of treble capacitor C1 nearest to L2 coil and unsolder from board (See drg on previous page).  
CAUTION: Be careful not to damage capacitor or capacitor wire.
8. Utilize the existing hole that C1 emerges from. Fully insert leg of resistor until resistor is standing on end. Trim end at track side of board to approx. 5 mm. Bend flat onto crossover track and solder in place. Make sure it does not short any tracks.
9. Twist other leg of resistor to capacitor and solder. Trim excess.
10. Glue resistor in place using hot melt glue or clear impact glue. Take care to ensure that the solder joint is away from other components.
11. Re-fit crossover to back panel.
12. Re-assemble speaker.
13. Audition.
14. Clean and re-pack speaker for customer.

## To Upgrade Nexus IV Treble Response

<p><b>Estimated Time required: 30 minutes</b></p>
---

Applicable to Nexus IV loudspeaker,  
between serial number 17219/20 and 24883/4.

Requires a simple resistor change in the crossover, from 2R2 to 2R7

Tools Required:

No. 2 pozidrive screwdriver

Collar bi-wiring tool

1 pair side cutters

5 - 10 mm flat bladed screwdriver

Soldering iron, temperature controlled 25 - 100 W

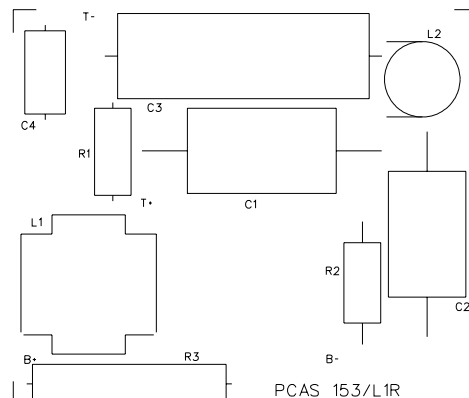
Solder

Components Required:

2 x 2R7 ohm wire wound resistors Part No. RES 120

### Instructions:

1. Remove trim ring from bass unit.
2. Remove screws securing bass unit.
3. Remove bass unit, de-solder and place to one side.  
Note: red wire to terminal marked red.
4. Remove crossover securing screw.
5. Turn speaker over and remove collars from sockets. Using number 2 screwdriver tap speaker socket to free crossover from cabinet.
6. Lift crossover out of speaker.
7. Snip legs of resistor R2 close to board (see drawing).
8. Remove resistor from board. Prise off using flat bladed screw driver. CAUTION: Be careful not to damage capacitor.
9. De-solder resistor legs and clear holes on pcb.
10. Fit new resistor and trim legs to approximately 5 mm to 7 mm. Bend legs over and solder in place. Glue resistor in place if possible using hot melt or clear impact glue.
11. Re-assemble speaker.
12. Audition.
13. Clean and re-pack speaker for customer.



UPGRADE KABER TREBLE RESPONSE

**To Upgrade Kaber Treble Response**

Applicable to Kabers prior to serial number 6245/6

**Estimated Time  
required:  
30 minutes**

Requires a simple resistor change in the crossover, from 2R7 to 3R3. Please note that this resistor was changed later to 3R9.

**Tools Required:**

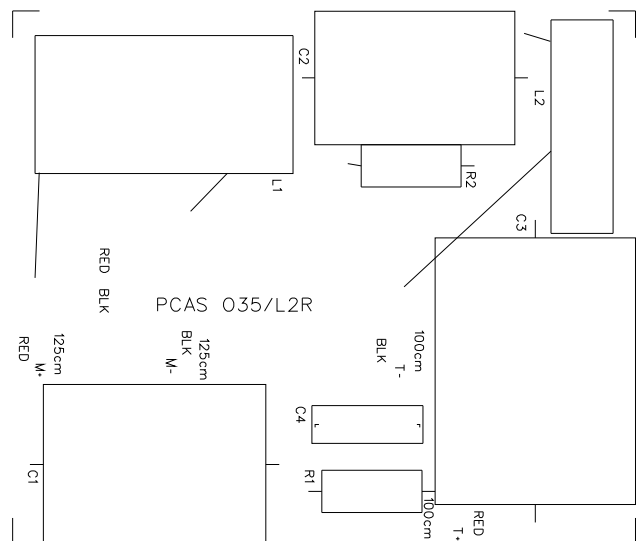
- No. 2 pozidrive screwdriver
- Collar bi-wiring tool
- 1 pair side cutters
- 5 - 10 mm flat bladed screwdriver
- Soldering iron, temperature controlled 25 - 100 W
- Solder

**Components Required:**

2 x 3R3 ohm wire wound resistors Part No. RES 132

**Instructions:**

1. Remove back panel securing screws.
2. Remove crossover securing screw.
3. Remove collars from crossover.
4. Remove crossover from back panel. Prise off using flat bladed screwdriver.
5. Snip legs of resistor R2 close to board. See drawing.
6. Remove resistor from board. Prise off using flat bladed screw driver.
7. De-solder resistor legs from board.
8. Fit new resistor and trim legs to approximately 5 to 7 mm. Bend legs over and solder in place. Glue resistor in place if possible using hot melt glue or clear impact glue.
9. Re-assemble crossover to panel and panel to speaker.
10. Audition.
11. Clean and re-pack speaker for customer.



## CONVERTING ISOBARIK TO EXTERNAL CROSSOVER

### TO CONVERT ISOBARIK PASSIVE TO EXTERNAL CROSSOVER ( PASSIVE OR AKTIVE)

Estimated Time  
required:  
30 minutes

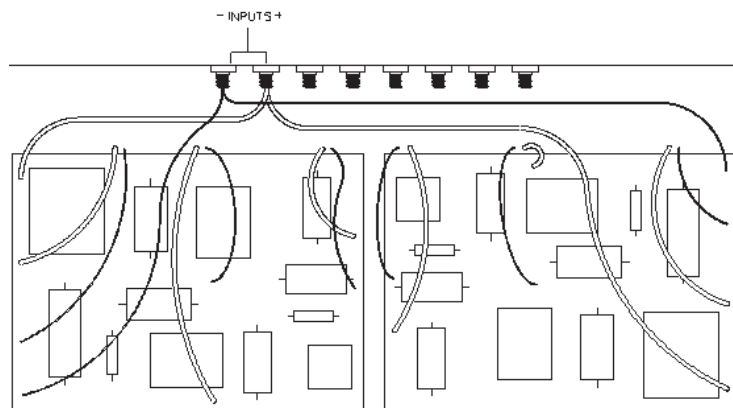
Applies to speakers between serial no. 5575/6 and serial number 6701/2.

#### Recommended Tools:

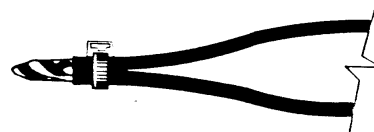
No. 1 pozidrive Screwdriver      Wire cutters  
No. 2 pozidrive Screwdriver      Wire strippers  
10mm A/F spanner                      12 small cable ties  
Good quality soldering iron (eg:Weller PU2D station with No. 7 PTDD tip)  
United Alloys or Frys 18 swg (1.2mm) solder  
PVA (wood glue)  
Damp cloth

#### Instructions:

1. Remove the Grilles - put a piece of tape over each treble unit. Turn the speaker upside down using the top piece from the original packing as a stand to protect it.
2. Remove the eight cover securing screws and the cover.
3. Remove the eight crossover securing screws.
4. Desolder the crossover input wires at the 4mm terminals and snip all other wires as close to the crossover board as possible. The crossovers can now be moved out of the way - do not lose the spacers or screws.
5. Strip, twist and cable-tie both negative (black) bass unit wires as shown on the enclosed diagram (a taper at the end, as shown, makes fitting easier).



6. Get an assistant to hold the untinned wires into the recess on the negative bass socket with a damp cloth while soldering them in place.

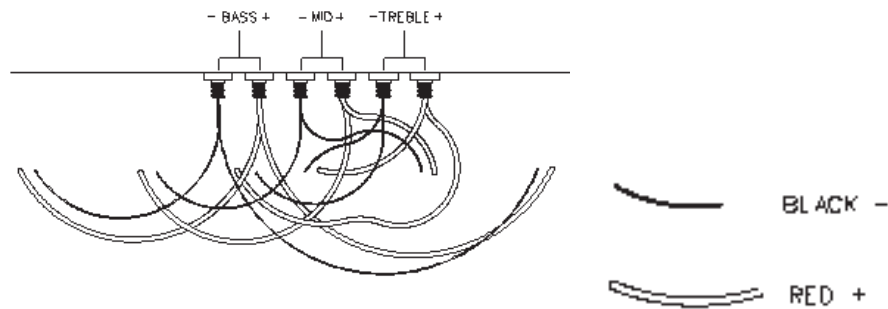


7. Apply enough heat to ensure a good

CONVERTING ISOBARIK TO EXTERNAL CROSSOVER

joint - test by giving it a sharp tug. Repeat this with the positive bass wires and the other units referring to the enclosed diagram.

Note: Do not cut the wires to neat lengths, someone may want to use the speaker passively at some later date and performance will be compromised if links have to be used.



8. Check the wiring before fitting the cover.
9. Repeat the above steps on the other speaker.

To test that you have wired the speakers correctly use the output of the treble amp or treble section of the 4 Ohm crossover **at low volume** through bass, mid and treble, thus preventing damage.

**NOTE:**

To refit the old internal crossovers carry out this procedure in reverse. Double check the wiring and test carefully at low volume until you have checked that the speaker is wired correctly.

LOUDSPEAKER HISTORY

**KELTIK**

**Introduced**

KELTIK AKTIV crossover replaced by  
KELTAKTAMP Aktiv crossover boards.  
See Install manual for details.

**Date**      **Serial number**

**Nov 91**

Aug 1993    N/A

Metal stand changed to Composite material.

Sept 1994    1043/44

Treble unit changed from SPKR 015/1 to 15/2

Oct 1994    1099/100

KELTAKTAMP Upgrade to Aktiv Bass boards

May 95      (Keltaktamp sn 605)

Mid-range unit upgraded from SPKR 007/4 to /5

Jan 96      1519/20

Treble unit upgraded to SPKR 015/3\*

Dec 96      1729/30

**KABER**

**Introduced**

From Kaber/1 to Kaber/2  
New crossovers and midrange unit.

**Sept 1992**

Treble Unit change

Oct 1994    12067/8

(From SPKR 015/1 to SPKR 015/2)

Mid-range unit upgraded from SPKR 007/4 to /5

Dec 95      13389/90

Treble unit upgraded to SPKR 015/3\*

Dec 96      14021/2

**KEILIDH**

**Introduced**

Treble Unit change  
(From SPKR 015/1 to SPKR 015/2)  
Treble unit upgraded to SPKR 015/3\*  
Bass/mid units upgraded from SPKR 013/2 to /4

**Sept 1992**

Oct 1994    23647/8

Dec 96      39727/8

Feb 97      40657/8

**TUKAN PRODUCT HISTORY**

**Introduced**

Treble Unit change  
(From SPKR 015/1 to SPKR 015/2)

**Nov 93**

Oct 1994    5277/8

Treble unit upgraded to SPKR 015/3\*

Dec 96      15127/28

**CENTRIK**

**Introduced**

**Discontinued, replaced by AV 5120**

Treble Unit change  
(From SPKR 015/1 to SPKR 015/2)

**July 94**

**April 96**

Oct 1994    1262

**SEKRIT IN-WALL**

**Introduced**

**April 94**

**SEKRIT ON-WALL**

**Introduced**

**Dec 94**

\* New treble unit easily identified by 'Bull-bars' instead of Mesh grill.

LOUDSPEAKER HISTORY**ISOBARIK HISTORY**

**Introduced 1973**  
**Discontinued 1992**

**Upgrade**

**Date**      **Serial No.**

Speaker, Major Upgrade:  
 Addition of KU-STONE ceramic  
 absorber, units and back now sealed  
 with gaskets instead of silicone,  
 improved cabinet bracing  
 (Upgrade not retrofittable)

Dec. 1991      8293/4

Crossover:  
 New 4 ohm external fitted in stand.  
 Facility for tri-wiring. DMS no longer  
 made as PMS can be used with  
 either passive (4 ohm) or Aktiv  
 crossover.

1988            6701/2

Treble Unit:  
 Cosmetic improvement. Fitted with  
 countersunk screws.

Sept. 1987      6201/2

Cabinet:  
 Crossover now in bottom of  
 speaker - accessible from  
 underneath. Facility for  
 converting easily to tri-wiring  
 or to active.

1987            5575/6

Midrange Units:  
 Improved rubber surround to  
 harder rubber.

Apr. 1986      4953/4

Cabinet:  
 Construction improved (internal  
 sealing and damping)

Dec. 1985      4825/6

Crossover/Treble Units:  
 Improved pcb with wider tracks  
 and better layout. Treble units  
 also changed to give a smoother  
 response. Linn logo incorporated  
 on front plate.

May 1984      3939/40

Bass/Midrange Units:  
 Sound deadening material painted  
 on bass and midrange units.

Mar. 1983      3000/1

Cabinet:  
 Changed from chipboard to MDF  
 and veneered on both sides.

Jan. 1982      2859/60

**ISOBARIK HISTORY Cont'd**

<b>Upgrade</b>	<b>Date</b>	<b>Serial No.</b>
Treble Unit: Fitted with t-nuts.	Oct. 1981	2741/2
Wiring: Changed internally to common earth at cannon socket.	Mar. 1980	11,035/6
Treble Unit: Scanspeak treble unit replaced with Hiquphon unit. Recognised by two concentric rings on unit.	Feb. 1980	10,925/6
Midrange Unit: Vented.	Nov. 1979	10,800/1
Damping: Midrange enclosure and cabinet damping changed.	Sep. 1978	10283/4
Current cabinet style adopted.	Sep. 1976	



LOUDSPEAKER HISTORY**SARA HISTORY**

	<b>Introduced</b>	<b>1978</b>
	<b>Discontinued</b>	<b>1989</b>
<b>Upgrade</b>	<b>Date</b>	<b>Serial No.</b>
Crossover: Bi-wiring introduced to Sara 9	Oct. 1988	20,913/4
Sara 9: Introduced, incorporating changes to treble unit (countersunk screws), bass unit (white disc removed and plastic surround changed to thicker rubber), crossover (now 4 ohm)	Sept. 1987	18,299/300
Sockets: Replaced cannon sockets with two 4 mm sockets.	Jun. 1985	16,300/1
Bass Unit: Surround changed to plastic material.	May 1985	16,051/2
Treble Unit: Smoother response. Incorporates Linn logo on front plate.	May 1984	14,731/2
Crossover: Resistor added in parallel with treble coil.	Feb. 1983	13,249/50
Unit Damping: Painted with sound deadening paint. Cabinet Material: Material change; now has rounded front.	Mar. 1982	10,850/1
Drive Unit: Sealer changed from mastic to silicone sealant.	Jan. 1980	10,440/1
Baffle: Changed from welded plastic to one piece moulded carbon filled ABS with removable ring for front bass unit. Bass unit venting increased.	Oct. 1979	10,280/81

**KABER HISTORY**

**Introduced 1989**

**Upgrade**

**Date**

**Serial No.**

**Kaber LS500/2 Introduced**

Major upgrade including new treble unit, mid range unit and crossovers. Cabinet damping improved. Mid range inserts changed from M4 to M5.

June 1991 6813/4

Crossover:  
Changed treble response - resistor value changed from 2.7 ohm to 3.3 ohm.

Feb. 1991 6,245/6

Cabinet:  
Design change - baffle attached with screws and glue.

Bass Unit:  
Improved sound quality - unit changed from SPKR 007/1 to SPKR 007/2.

Sep. 1989 2,967/8

LOUDSPEAKER HISTORY**NEXUSHISTORY**

**Introduced**      **1987**  
**Discontinued**    **1993**

**Upgrade**

**Date**            **Serial No.**

Bass Unit Upgrade:

Aug 1991      26,443/4

SPKR 001/M2 replaced by  
 SPKR 001/M3. Now includes flux  
 ring. M2 no longer available, so  
 replace in pairs.

Crossover:

Change to treble response on  
 crossover. Resistor value changed.

Feb. 1991      24,833/4

Stand Inserts:

Two inserts added to accommodate  
 the Ku-stone stand.

(except serial nos. 19,555 - 19,578)

Feb. 1990      19,487/8

Bass Unit:

Change from M1 to M2 - improved  
 spider.

Nov. 1989      18,409/10

**Nexus/4:**

Introduced Nexus/4. New crossover  
 and treble unit.

Aug. 1989

(2E-140/H repl by SPKR 010/1)

Vinyl            17,219/20

Wooden cabinets introduced  
 in walnut and black ash finishes.

Walnut          15,721/2

Black Ash       15,723/4

Cabinet: Changed from back panel  
 mounted crossover to internally fitted  
 on back of cabinet. Sockets changed  
 to colour coded type.

Dec. 1988      12,129/30

Stand Insert: Changed to diagonal  
 layout on base of speaker.

Oct. 1988      11,611/2

Baffle: Colour changed from light gray  
 to dark grey.

Oct. 1988      11,216/2

Crossover: Added two capacitors.  
 Damping added in speaker port.

Sep. 1988      10,617/8

<b>KANHISTORY</b>	<b>Introduced</b>	<b>1979</b>
	<b>Discontinued</b>	<b>1993</b>
<b>Upgrade</b>	<b>Date</b>	<b>Serial No.</b>
KU-STONE Fitted to speakers, units now fitted with gaskets instead of silicone . (Upgrade not retrofittable)	Sept.91	48,489/90
Crossover: Revision no. changed to PCAS 134/L4R4	Mar. 1989	42,601/2
<b>Kan II:</b> Kan II introduced. Incorporates changes to crossover; bi-wired option; change in position of treble unit.	Jan. 1989	41,905/6
Crossover: Capacitors improved to Bennic type.	Feb. 1988	39,005/6
Bass Unit: Improved performance.	Dec. 1985	33,005/6
Sockets: Changed to Linn 4 mm metal socket. Crossover change.	Feb. 1985	26,791/2
Treble Unit: Smoother response. Linn logo incorporated on front plate. Crossover revision.	May 1984	24,077/8
Crossover: Resistor added in parallel to treble coil.	Feb. 1983	20,005/6
Unit Damping: Unit painted with sound deadening material.		
Cabinet: Material changed to medite.	May 1982	19,153/4
Drive Units: Bass units painted with sound deadening paint - silicone sealant	Mar. 1982	18,501/2

LOUDSPEAKER HISTORY

<b>HELIX HISTORY</b>	<b>Introduced</b>	<b>1988</b>
	<b>Discontinued</b>	<b>1993</b>
<b>Upgrade</b>	<b>Date</b>	<b>Serial No.</b>
Bass Unit Upgrade SPKR001/M2 replaced by SPKR 001/M3. Now includes flux ring. M2 no longer available, so if replacing do so in pairs.	Aug 1991	16,087/8
Crossover: Treble response improved by changing a resistor value on crossover	Feb. 1991	13,395/6
Stand Inserts: Two inserts added to accommodate Ku-stone stand.	Mar. 1990	10,599/60
Helix II: Helix II introduced incorporating changes to cabinet facia, crossover and treble units (SPKR 011/2) now ferro-cooled.	Feb. 1990	1,001/2

**Note:**

For spare purposes, original Helix 1 treble unit (SPKR 005/1) has been upgraded to Nexus treble unit (SPKR 010/1) . This will improve performance and slightly increase power handling.

<b>INDEX HISTORY</b>	<b>Introduced Discontinued</b>	<b>1985 1992</b>
<b>Upgrade</b>	<b>Date</b>	<b>Serial No.</b>
Grille: Changed from twopart cloth and facade to facade moulded complete with Grille cloth.	April 1991	11,435/6
Crossover: Resistor in treble section changed to improve treble response.	Feb.1991	9,339/40
<b>Index II</b> New Design: Index II introduced incorporating changes to the crossover to allow bi-wiring options; new style cabinet with removable facia; change to new type speaker connectors.	March 1990	1,001/2*
Treble Unt: Front mountingplate made thicker and larger. Now incorporates the Linn Logo.	Aug. 1987	18,701/2
Bass Unit: New style unit, strengthened surround and new cone material	June 1987	17,947/8
Crossover: Improved layout	May 1987	17,319
<b>Index Plus</b> Index Plus introduced incorporating cabinet material change: Drive unit positioning changed;crossover modification, improvement in treble response.	Sept.1986	10,137/8

\*Serial number re-started at 1,001/2 for the **Index II**

LOUDSPEAKER SPECIFICATIONS

**KELTIK SPECIFICATIONS (Aktiv )**

Frequency Response	20 Hz to 20 KhZ +/- 1dB
Efficiency	N/A
Aktiv/Passive	Only available as Aktiv.
Type	Three way, Aktiv. Isobarik Loading
Wiring options	Aktiv only (3 or 4 Way)
Minimum amplifier requirements:	2 x 50w/8 Ohms 1 x 80 w/4 Ohms
Dimensions:	
Height	1037 mm
Width	370 mm
Depth	370 mm
Weight	52 kg each speaker
Special Features	Aktiv crossover setup

**KABER**

**AKTIV**

**PASSIVE**

Frequency Response	20 Hz to 20 KHZ +/- 2dB	20 Hz to 20 KHZ +/- 3dB
Nominal impedance	-	4 Ohms
Efficiency	n/a	87dB (1 watt at 1 metre, 1KHZ)
Type	Three way, Infinite baffle	Three way, Infinite baffle
Wiring options	(3 Way)	Single, Bi and Tri-wired
Minimum amplifier requirements:	3 x 60W/8 Ohms	60W/8 Ohms
Dimensions:	Height 900 mm Width 192 mm Depth 280 mm	Same as Aktiv
Weight	26 kg each speaker	
special Features	Aktiv crossover setup	Treble can be reduced by 1db

LOUDSPEAKER SPECIFICATIONS

<b>KEILIDH</b>	<b>AKTIV</b>	<b>PASSIVE</b>
Frequency Response	45 Hz to 20 KHZ+/- 3dB	65 Hz to 20 KHZ+/- 3dB
Nominal impedance	-	4 Ohms
Efficiency	n/a	92 dB (1 watt at 1 metre, 1KHZ)
Type	Two way, Infinite baffle	Two way, Infinite baffle
Wiring options	2 or 3 way Aktiv	Single, Bi-wired
Minimum amplifier requirements:	2 x 50 W/4 Ohms	1 x 60 W/4 Ohms
Dimensions:	Height 825 mm Width 200 mm Depth 275 mm	Same as Aktiv
Weight	18 kg each speaker	

<b>TUKAN</b>	<b>PASSIVE</b>	<b>AKTIV</b>
Frequency Response	80 Hz to 20 KHZ+/- 3dB	70 Hz to 20 KHZ+/- 3dB
Nominal impedance	4 Ohms	8 Ohms per unit
Efficiency	87 dB (1 watt at 1 metre, 1KHZ)	
Type	Two way, Infinite baffle	
Wiring options	Single, Bi-wired Aktiv	
Minimum amplifier requirements:	1 x 60 W/4 Ohms	
Dimensions:	Height 303 mm Width 188 mm Depth 183 mm	Same as Passive
Weight	5.6 kg each speaker	Same as Passive
Special Features	Treble can be reduced by 1db.	



LOUDSPEAKER SPECIFICATIONS

<b>SEKRIT</b>	<b>ON-WALL</b>	<b>IN-WALL</b>
Frequency Response		
Passive	60 Hz to 20 KHZ+/- 3dB	80 Hz to 20 KHZ+/- 3dB
Active	50 Hz to 20 KHZ+/- 3dB	50 Hz to 20 KHZ+/- 3dB
Nominal impedance		
Passive	4 Ohms	4 Ohms
Active	4 Ohms Bass 8 Ohms Treble	4 Ohms Bass 6 Ohms Treble
Efficiency (1 watt at 1 metre, 1KHZ)	90 dB	90 dB
Type	Two way, bass reflex	Two way passive. Infinite baffle or Bass reflex. (Removable port plug)
Wiring options	Single, Bi-wired and Aktiv	Single, Bi-wired and Aktiv.
Minimum amplifier requirements:	1 x 30 W/4 Ohms	1 x 30 W/4 Ohms
Dimensions:	Height 475 mm Width 252 mm Depth 123 mm	Height 444 mm Width 228 mm Depth 86 mm
Mounting Depth	-	72mm from surface of wall
Weight	5.8 kg each speaker	3.1 kg each speaker inc mounting frame
Special Features :	Treble can be reduced by 1db on both In and On-Wall	
		Removable plug to change from Infinite Baffle to Bass reflex

<b>CENTRIK</b>	<b>PASSIVE</b>
Frequency Response	75 Hz to 20 KHZ+/- 3dB
Nominal Impedance	4 Ohms
Efficiency	92 dB (1 watt at 1 metre, 1KHZ)
Type	Single centre speaker. three way, Infinite baffle
Wiring options	Single, Bi-wired (Aktiv to follow)
Minimum amplifier requirements:	1 x 60 W/4 Ohms
Dimensions:	Height 200mm Width 516 mm Depth 275 mm
Special Features :	Treble can be reduced by 1db.

**DMS ISOBARIK SPECIFICATIONS**

**Discontinued 1992**

Frequency Response	25 Hz to 20 KhZ
Minimum impedance	3.7 ohms (4 ohm crossover)
Efficiency	86 dB for 1 watt at 1 metre (1 kHz)
Crossover point	375 Hz and 3 kHz
Power Handling	100 watts music
Aktive/passive?	Yes
Tri-wirable?	Yes
Drive Units: Treble	2 x 19 mm soft dome tweeter
Mid	2 x B110 (specially modified)
Bass	2 x B139 (specially modified)
Cabinet Loading	Infinite baffle

Dimensions:

Height	760 mm
Width	343 mm
Depth	416 mm

Weight 43 kg each speaker

Stand Height 230 mm (not including spikes)

**SARA 9 SPECIFICATIONS**

**Discontinued 1990**

Frequency Response	50 Hz to 20 KhZ +/-2.5 dB
Impedance	4 Ohms nominal
Efficiency	88 dB for 1 watt at 1 metre (1 kHz)
Crossover point	2.5 kHz
Power Handling	75 watts
Bi-wirable?	Yes. (Sara 9 Bi-wired only)
Drive Units: Treble	1 x 19 mm soft dome tweeter
Bass	1 x 200 mm carbon loaded polypropylene bass unit

Cabinet Loading Isobarik

Dimensions:

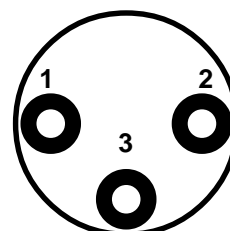
Height	540 mm
Width	255 mm
Depth	375 mm

Weight 12 kg each speaker

Stand Height 500 mm (not including spikes)

Early Sara and Isobarik (DMS & PMS) loudspeakers were fitted with a 3 pin XLR (Cannon) male socket. The wiring connections are:

- 1: No connection
- 2: Positive [+] connection
- 3: Negative [-] connection



LOUDSPEAKER SPECIFICATIONS**KABER SPECIFICATIONS**

Frequency Response	60 Hz to 20 KhZ +/- 3 dB
Minimum impedance	4 ohms
Efficiency	87 dB for 1 watt at 1 metre (1 kHz)
Crossover point	300 Hz and 2.7 kHz
Power Handling	75 watts music
Tri-wirable?	Yes
Drive Units:	
Treble	1 x 19 mm soft dome tweeter
Mid/Bass	2 x 125 mm units
Cabinet Loading	Infinite baffle
Dimensions:	
Height	900 mm
Width	192 mm
Depth	280 mm
Weight	26 kg each speaker

**NEXUS SPECIFICATIONS****Discontinued 1993**

Frequency Response	50 Hz to 20 KhZ +/-2.5 dB
Minimum impedance	6.8 Ohms
Efficiency	88 dB for 1 watt at 1 metre (1 kHz)
Crossover point	2.5 kHz
Power Handling	75 watts
Bi-wirable?	Yes
Drive Units:	
Treble	1 x 19 mm soft dome tweeter
Bass	1 x 200 mm carbon loaded poly-propylene bass unit
Cabinet Loading	Ported
Dimensions:	
Height	540 mm
Width	255 mm
Depth	375 mm
Weight	12 kg each speaker
Stand Height	375 mm

**KAN II SPECIFICATIONS****Discontinued 1994**

Frequency Response	70 Hz to 20 kHz +/- 3dB
Minimum impedance	6.8 ohms
Efficiency	86dB for 1 watt at 1 metre (1 kHz)
Crossover point	2.7 kHz
Power handling	50 watts music power
Bi-wirable?	Yes
Drive Units:	
Treble	1 x 19 mm soft dome
Bass	1 x B110 (modified)
Cabinet loading	Infinite baffle
Dimensions:	
Height	303 mm
Width	188 mm
Depth	164 mm
Weight	5 kg each speaker
Stand height	565 mm

**HELIX SPECIFICATIONS**

**Discontinued 1992**

Frequency Response		55 Hz to 20 KhZ +/- 3 dB
Minimum impedance		6.8 ohms
Efficiency		88 dB for 1 watt at 1 metre (1 kHz)
Crossover point		3 kHz
Power Handling		80 watts
Bi-wirable?		Yes
Drive Units:	Treble	1 x 19 mm polymide dome, ferrofluid damped tweeter
	Bass	1 x 200 mm carbon loaded poly-propylene bass unit
Cabinet Loading		Ported
Dimensions:		
Height		510 mm
Width		255 mm
Depth		286 mm
Weight		10 kg each speaker
Stand Height		375 mm

**INDEX II SPECIFICATIONS**

**Discontinued 1992**

Frequency Response		70 Hz to 20 KhZ +/- 3 dB
Minimum impedance		6.8 ohms
Efficiency		87 dB for 1 watt at 1 metre (1 kHz)
Crossover point		3.5 kHz
Power Handling		80 watts
Bi-wirable?		Yes
Drive Units:	Treble	1 x 19 mm polymide dome, ferrofluid damped tweeter
	Bass	1 x 160 mm carbon loaded poly-propylene bass unit
Cabinet Loading		Infinite Baffle
Dimensions:		
Height		436 mm
Width		208 mm
Depth		235 mm
Weight		7.5 kg each speaker
Stand Height		350 mm

BIWIRING LOUDSPEAKERS**THE ADVANTAGES OF BIWIRING LOUDSPEAKERS**

A single cable (pair of leads) between the amplifier and the speaker means that each drive unit in the speaker has the same signal path from the amplifier.

If the leads had zero resistance this would not matter but even the best speaker leads have some, albeit small, resistance.

Normally, the resistance is about 0.01 Ohm per metre, therefore, with a typical length of speaker leads (5m x 2) this would mean an overall resistance of 0.1 Ohm.

Large bass currents, up to 10A, will, therefore, produce a voltage drop of up to 1 volt along the cable. If a common cable is used for bass and treble, this voltage drop will also affect the treble unit.

Biwiring gives each drive unit its own signal path to the amplifier and so produces a clearer sound which can easily be demonstrated.

Similar advantages occur in the midrange by tri-wiring a 3-way speaker.

**Bi-Wiring & Beyond**

A conventional loudspeaker is connected to the amplifier by a single length of two-conductor speaker cable. Like most speakers the Linn loudspeakers may be installed in this manner. But, unlike the majority of speakers, most Linn models can also be Bi-Wired.

When bi-wired, the speaker's crossover network is divided into two electrically separate sections (usually by the removal of a jumper or link on the rear of the speaker). Two separate speaker cables are then run from the amplifier to each of the loudspeakers. One of these wires connects to the treble section of the speaker's crossover, and the other connects to the bass section of the crossover.

An A/B comparison of the same speaker conventionally wired, and then bi-wired, will reveal a dramatic improvement in performance. This performance gain is quite startling and often seems to be totally out of proportion with the apparently small change that was made in the wiring of the speaker.

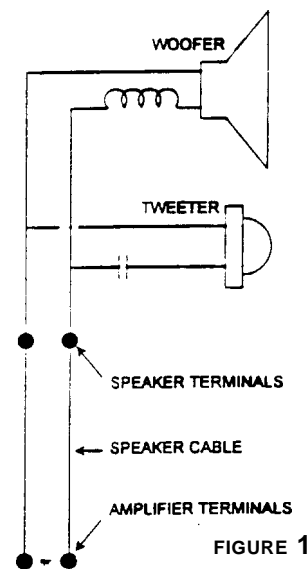


FIGURE 1

### The Signal Path

To see how this performance gain is possible, we need only follow the signal on its path from the amplifier to (*and through*) the loudspeaker.

As shown in Figure 1, the signal travels along the speaker cable from the amplifier to the speaker. Upon reaching the speaker, the signal encounters the speaker's crossover network. A crossover network can contain dozens of components and perform several functions including level adjustments, time delays, and phase correction. But for the purpose of examining the effects of bi-wiring, we need only look at the crossover's basic function of dividing the signal into the frequency ranges appropriate for each drive unit.

Figure 1 shows a very simple crossover con-figured for conventional. Single-wire operation. This consists of only one capacitor and one inductor and it routes the high frequencies to the treble and the low frequencies to the bass.

After the signals pass through their respective drive units, they are recom-bined and share a common return path back to the amplifier. This path includes the ground circuit of the crossover board as well as the return leg of the speaker cable.

Thus, for the vast Majority of their travel the bass and treble signals share the same path the only time the signals have separate paths is over the very few feet of wire that connect the drive units to the crossover.

Because the bass and treble signals do share the same path, there is an opportunity for the signals to interact. The amount of interaction may actually be quite small relative to the magnitude of the original musical signal. However, since the majority of the energy in a typical musical signal is at the lower frequencies, the bass signal is quite large when compared to the treble signal. Thus, if even a very small portion of the energy in the bass signal interferes with the much smaller treble signal, the results can be quite serious.

### Bi-Wiring

Bi-Wiring virtually eliminates this interaction problem by providing totally separate paths for the bass and treble signals.

It should be noted that to accomplish this it is necessary to do more than just provide two lengths of speaker cable. The portions of the circuit inside the speaker that are usually common to both the bass and treble signals must also be separated. This requires that the crossover be designed in a manner that allows the ground circuit of the crossover board to be separated into two distinct sections. This is generally accomplished by providing removable links or jumpers.

As you can see once separate speaker cables have been provided and the ground circuit broken, the crossovers capacitor blocks the bass signal from the *entire* treble path. In a similar manner, the low pass section of the crossover prevents the treble signal from travelling along the bass path.

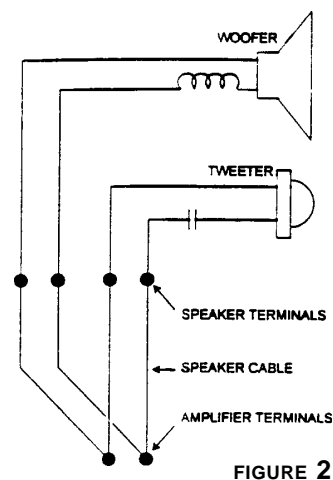


FIGURE 2

## BIWIRING LOUDSPEAKERS

### **Tri-Wiring**

The same techniques that are applied in bi-wiring can be used to tri-wire a loudspeaker with three drivers. The Linn Kaber is a prime example of this. Removing links on the rear of the speaker electrically isolates the three drivers. This allows three speaker cables to be run to each loudspeaker, providing a separate signal path for each drive unit.

### **The Next Step**

You may want to think of bi-wiring (or *tri-wiring*) as a method of improving the performance of your system in easy-to-manage steps, without the financial losses associated with repeatedly trading in equipment.

The first step, upgrading from conventional wiring to bi-wiring, requires only the purchase of an extra set of speaker cables. Because the cost is so low, you may even want to do this when you initially purchase your speakers

### **Bi-Amplification**

Once you have BI-WIRED your speakers you can consider taking the next step to passive bi-amplification. In this configuration, one amplifier supplies the signal to the treble section of the speaker's crossover, and a second amplifier is used to drive the bass section.

This technique not only provides more power, but also results in better control of the drivers and further reduces any possibilities for interaction between the bass and the treble. The result is a significant improvement in the musical performance.

We use the term passive bi-amplification because the filters provided by the speaker's original passive crossover network are still being used.

### **Active Multi-Amplification**

In many of the Linn loudspeakers further improvements are possible by taking yet a third step. Replacing passive multi-amplification with active multi-amplification. This eliminates the speaker's passive crossover entirely by substituting a Linn AKTIV electronic crossover ahead (or inside) of the amplifiers.

By removing the passive crossover from the circuit path and more closely coupling the drive units to the power amplifier. AKTIV operation delivers more power to the loudspeaker and more accurately controls the movements of the drive units.

When using a passive crossover the power necessary to operate the crossover is actually provided by using part of the energy in the musical signal. With AKTIV operation, all signal processing is done in an active (*i.e., powered*) circuit prior to final amplification, eliminating the power drain caused by the passive crossover.

In addition, shaping and controlling the signal while it is still at line-levels provides the opportunity to use significantly more sophisticated crossover techniques. This results in better filtering and more accurate amplitude, phase, and time response. The flexibility of an active system also enables the system to be tuned to suit the room.

### **Cable**

To simplify multi-wire and multi-amplifier installations, Linn manufacture speaker cable specifically designed for multiple runs. Use Linn K600 for tri-wire applications and K400 where bi-wiring is required. Linn K20 is also available where conventional single wiring is to be used.

**KU-STONE STAND****(Discontinued in 1994)**

The Ku-stone stand is designed for use with Index, Helix and Nexus loudspeakers. It employs an upright column of bonded flint composite material to create an absorbent, but rigid, assembly.

The base is constructed of a heavy, strong 5 mm steel plate covered by a high-density plastic moulding. The spiked feet can be adjusted from the top, allowing quicker set-up, enhancing speaker demonstrations.

The stand can be bolted directly to Linn speakers, but an adapter kit is available which allows general purpose use of the stand with other loudspeakers.

The Ku-stone stand improves loudspeaker stability and is acoustically very dead. It is unique to Linn and its performance will enable Linn retailers to give customers more pleasure from their music system.

Dimensions:

Height	350 mm
Width	275 mm
Depth	340 mm

**K20 CABLE**

This cable is available in 100 metre drums.

**SPECIFICATIONS FOR LINN K20 CABLE**

Cable	2 core dumbbell wire
Core	4mm square
Insulation	grey pvc
Strand	56/0.3 mm copper
Inductance	.93mh/ Metre 1kHz (typical value)
Capacitance	16.pf per metre at 1 kHz (typical value)
Impedance	.005 Ohm/metre

**K400 AND K600 CABLE**

This cable is available in 25 metre drums and consists of K20 cores in twisted pairs, two pairs in K400 for bi-wiring and three pairs in K600 in for tri-wiring. Use these cables when bi- or tri-wiring Passive or Aktiv as they offer a sound advantage over the K20 as well as neater appearance.



## LOUDSPEAKER ACCESSORIES

### **LINN BRACKET (Wall mounting speaker bracket)**

Designed to work with the SEKRIT and TUKAN speakers these brackets offer a very rigid and strong support that allows the speakers to give their best performance. The unique curved shape allows gives strength to the assembly and offers flexibility of both vertical and horizontal adjustment. The loudspeakers are held within 6 cm of the wall and the mounting brackets are hidden behind the speakers.

### **LINN SKEETS (Floor protectors)**

All Linn loudspeakers employ adjustable spikes to ensure optimum performance. These spikes will not harm carpets but to protect hardwood or tiled floors, or tatami matting the spike can be mounted on Linn Skeets.