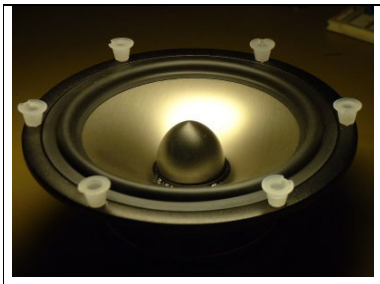
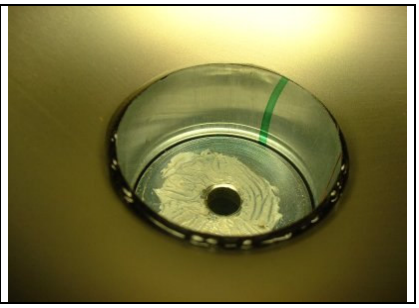
Construction

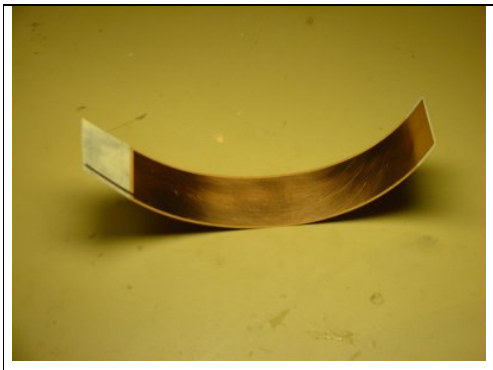
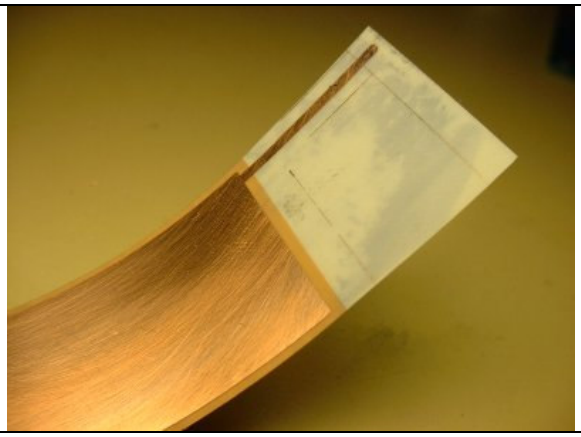
Seas L18RNX/P





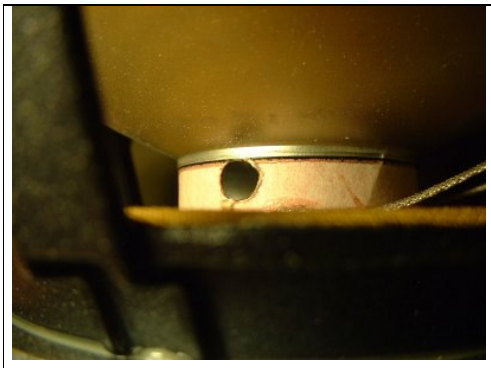
Here the first picture is our first victim,Seas L18RNX/Pbefore we start to misuse and modify it beyond repair.In the second picture we have got rid of the phase plug. This is easily doneby turning it until it gets loose. Easiest way to do that is byfirst drilling a hole into the side and use the drill to turn.Third picture is just a close shot of the pole piece / voice coilformer after removing the phase plug. There is some residualglue that have to be removed before gluing or otherwiseattaching the inner capacitor surface (aluminium cylinder)to the top of the pole piece.

Outer surface of the measurement capacitor

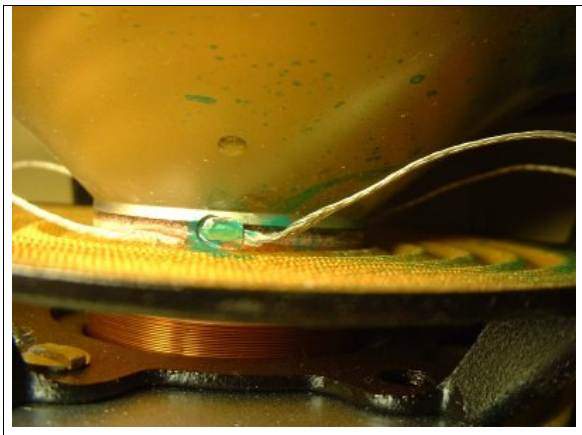
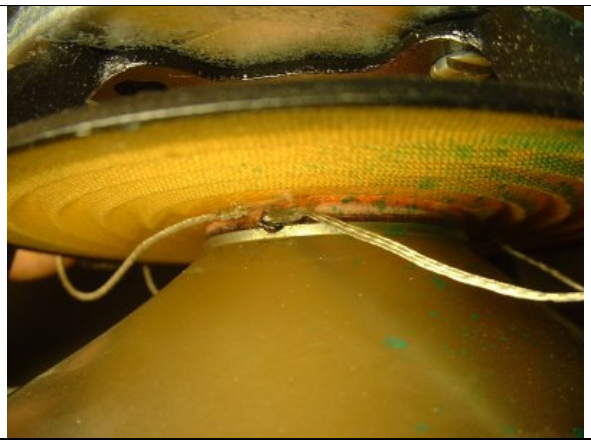
Here is the outer cylinder of the measurement capacitormade of 0.1mm 2-sidedglass fibre "board". Close shot shows the strip thatis used to get through the voice coil former withoutshort-circuit. Remember, there is voltage in thekV-range, so care should be taken that the boardand other parts can withstand it.There is still additional work to be done withscissors...

Installing the outer surface



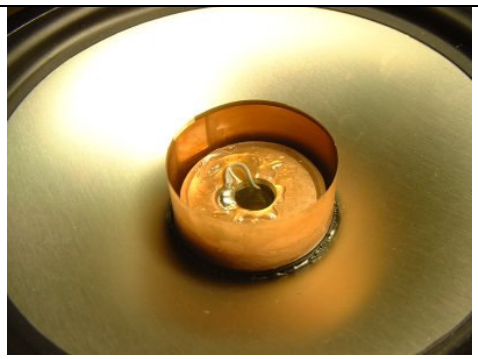
First we have to drill some holes to the voice coil formerto get the outer surface connections to the "outer world".The strip in the glass fibre board will be drawn throughthis hole. In the other side there is similar hole to makeconnection to the other side of the board (earth). Voice coilformer itseld should also be earthed to get lower noise.The pictures above are actually from other prototype(Seas L17REX/P), but driver is very similar to L18RNX/P.

There are some pictures of the measurement system withoutgluing them in place. First picture is a closeup view ofthe inner cylinder made of aluminium, second is the outercylinder, third shows how they will approximately beinstalled (just thrown in at that stage).

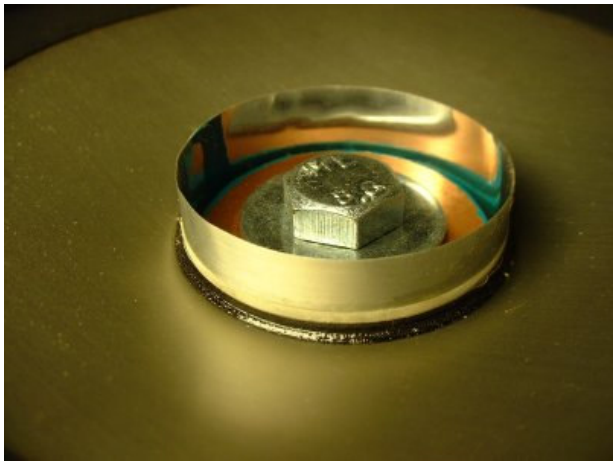
Here are the leadout wires (of the measurement capacitor's outercylinder and shield). Click on the pictures for high resolution versions.The green stuff on the cone and spider is just spray-onPCB-coating I used for the board, where these leadoutwires are connected (sorry, no picture of that). This PCBonly contains simple 1st order RC-filter (10 MΩ, 100 nF)to filter thehigh voltage connected to the measurement capacitor.Connections look quite terrible in these shots, but they work(at least for a while).

Final assembly

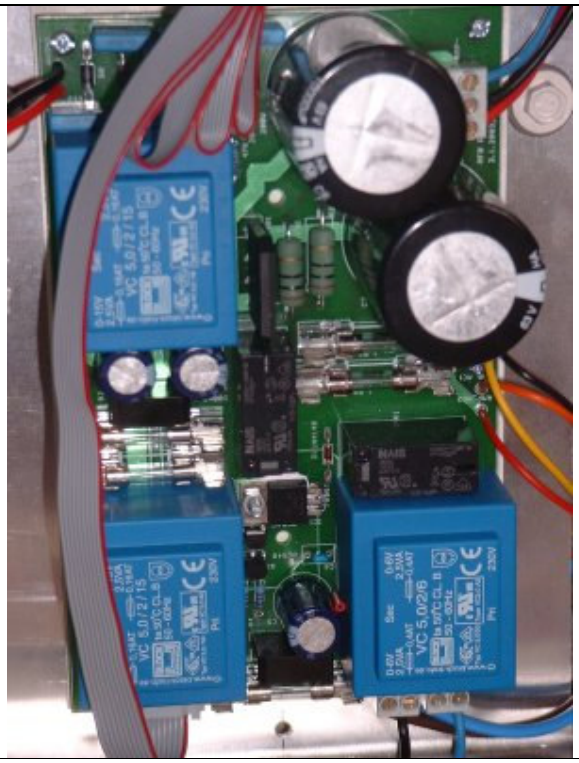
Here is the final assembly (well not exactly, you still needdust cap...). Outer cylinder is glued to the voice coilformer and inner one is sandwitched between two piecesof PCB (pertinax, as it is easier to machine). Top PCBlayer is connected to earth through the grey wire.Sandwitched inner cylinder is connected to operationalamplifier circuit that gives you voltage proportionalto the velocity of the cone. Ventilation is donethrough the hole in the pole piece and inner cylinder.

Alternative construction



Above is one alternative way of constuction. There outer cylinderis also made of of aluminium sheet. Inner cylinder isattached to the driver's pole piece with a bolt thatgoes through the whole magnet assembly. This is a bitdangerous construction since there is no shieldingaround the high voltage cylinder. The white thingat the outer cylinder-voice coil former-junction isnomex-insulating paper. Also problem with this constructionis the lack of ventilation hole in the pole piece.

Finished speaker



All pictures are links to high resolution versions.This is the speaker as described in the PDF documentDescription of prototypeswith SEAS L17REX/P driver, 4th order linkwitz rileycrossover and transconductance amplifier for thebass-midrange driver. Black coaxial cable with BNC-connectorcomes from the measurement capacitor.

Two PCB's are:

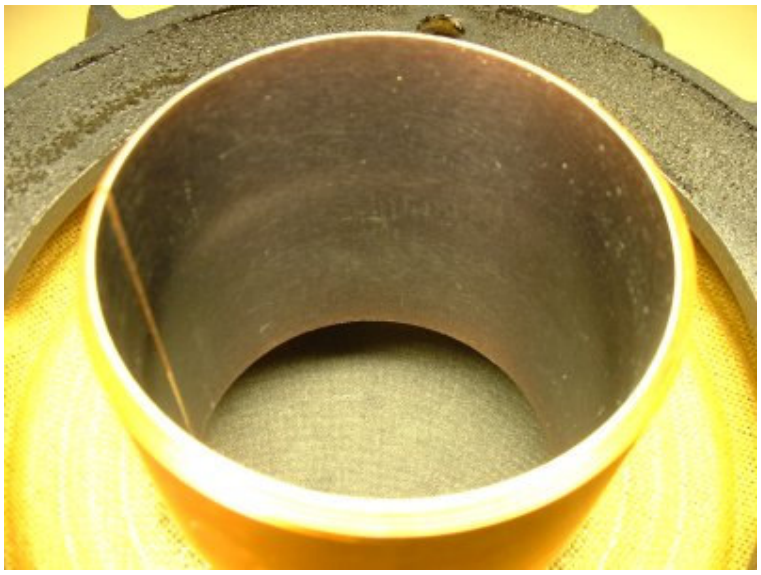
- power board (+15V for opamps, 5V formicrocontroller and relays, +25V for amplifiers and1200V for measurement capacitor). Soft start with thehelp of microcontroller on the control board. Toroidaltransformer for the amps is on the other side of thealuminium plate.
- Control board. PIC microcontroller handling the startupthings (soft start, correct starting order and such).PIC also measures the incoming signal and cone velocity.These could be used to wake up on signal and handlingoverload situations, but currently this is not implemented,it just powers thing up in correct order. On the leftthere is the velocity measurement (with standard TL074op-amp). Amplifiers are at the top (bass-midrange istransconductance type. 4th order linkwitz-rileycrossover is at the center of the board.

Peerless XLS 10"

This is nice driver, as it is assembled with screws.Magnet assembly is attached to the cone/basket withfour screws. As principle is same as in the previousSEAS-driver, there are only some pictures of thedifferences.

Cone/basket assembly.

Magnet system. The aluminium cylinder on top of the polepiece is original one that will be replaced with similar"sandwitched" one that is presented in SEAS L18RNX-prototype.



Voice coil former before attachment of the outercylinder of the measurement capacitor.

Voice coil former with outer cylinder of the measurementcapacitor attached. This version is made from aluminiumsheet.

Some pictures of the "complete" system and electronics.Second picture is early version of the electronics, thirdis more "integrated" version of the same.
You may read more about the prototypes and measurementsfrom Description of prototypes