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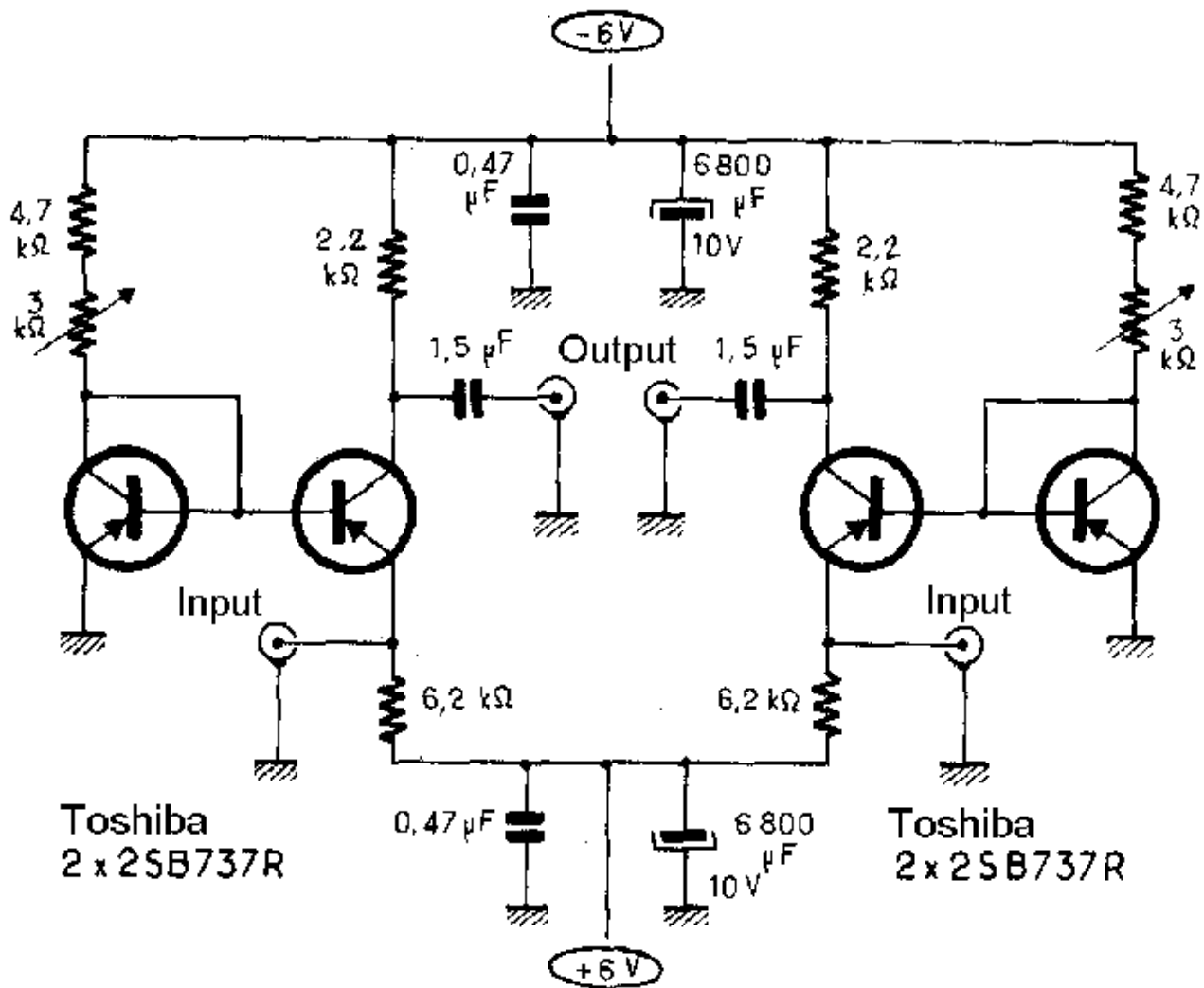
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Hiraga MC preamp

Preamplifier

That's my pre-pre-amplifier. That's the only solid state product I use, and only because tubes are too noisy at such low levels. I named it "Pré". Schematic by Jean Hiraga described in "L'Audiophile", a disappeared high-end French revue.



A very simple design where each element has to be chosen with extreme care. Adjust the 3KOhms trimmer to obtain 0V in input (to avoid to inject DC in the cartridge !). The output capacitors should be of the highest quality possible, try as many types as you can, you'll be surprised.

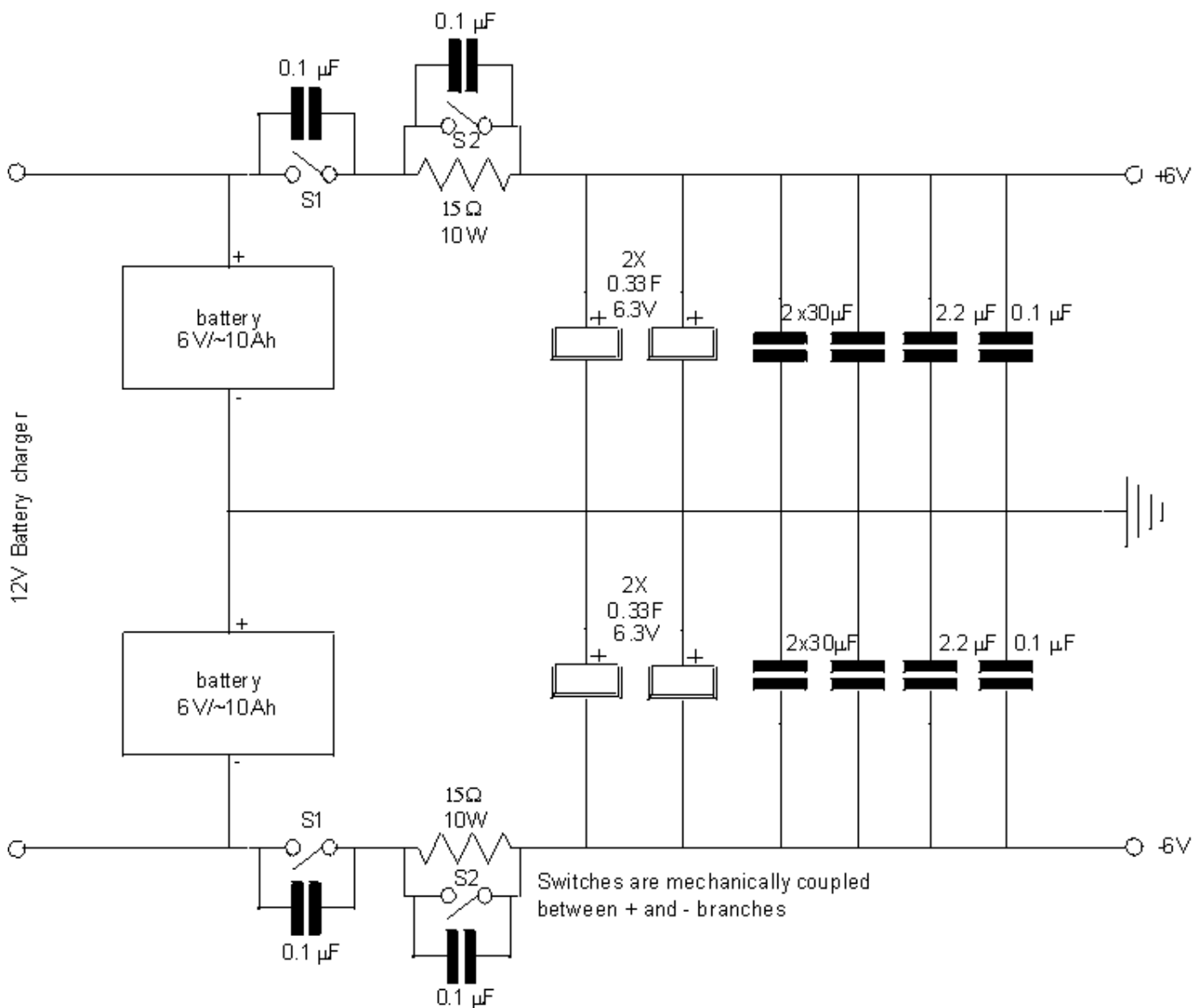
The power supply should be large and quick, see below how I did it.
The transistors are mounted in contact for a better thermal balance.

Power Supply

Here is an example of a supply that can be used with such preamp.

Of course, you can adapt the values of the components to your budget.

As anecdote, the biggest version described by L'Audiophile had caps for a total of 3.4 Farads (=3'400'000 microfarads ...) !



As the 2SB737R are probably no more available, in January 98, I asked Toshiba Electronics Europe for a substitute. They indicated me the TBC560, here are its specs:

TBC559/560

SILICON PNP EPITAXIAL TYPE

PRIMARILY INTENDED FOR USE IN DRIVER STAGE OF
AUDIO AMPLIFIERS.

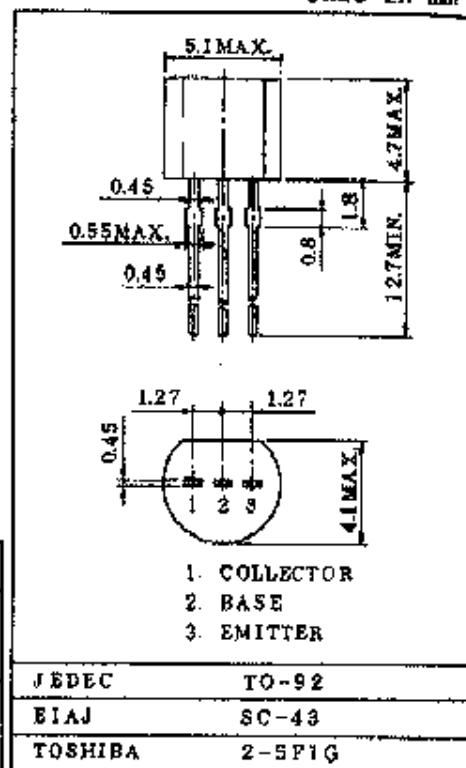
THE TBC559 AND TBC560 IS LOW NOISE TYPE FOR INPUT
STAGE OF AUDIO AMPLIFIERS.

- . High V_{CEO} : -45V (TBC560)
 -25V (TBC559)
- . High h_{FE} : 125-475

MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Breakdown Voltage	TBC559	$V_{(BR)CBO}$	-30	V
	TBC560		-50	
Collector-Emitter Breakdown Voltage	TBC559	$V_{(BR)CEO}$	-25	V
	TBC560		-45	
Emitter-Base Breakdown Voltage		$V_{(BR)EBO}$	-5	V
Collector Current	DC	I_C	-100	mA
	Peak	I_{CP}	-200	
Base Current (Peak)		I_{BP}	-200	mA
Collector Power Dissipation		P_C	500	mW
Junction Temperature		T_j	150	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-65~150	$^\circ\text{C}$

Unit in mm



Weight : 0.21g

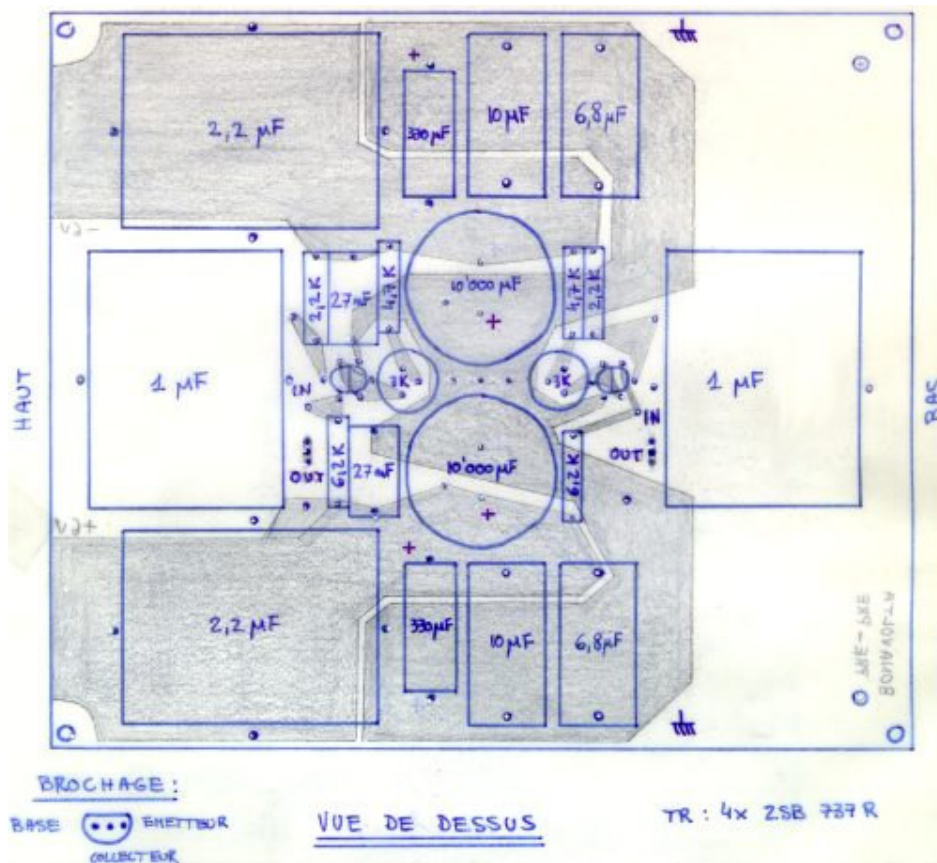
TBC559/560**ELECTRICAL CHARACTERISTICS (Ta=25°C)**

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		ICBO	VCE=-30V, IE=0	-	-	-15	nA
Emitter Cut-off Current		IEBO	VEB=-5V, IC=0	-	-	-1	μA
Collector-Emitter Breakdown Voltage	TBC559	V(BR)CEO	IC=-1mA, IB=0	-30	-	-	V
	TBC560			-45	-	-	
DC Current Gain		hFE (Note)	VCE=-5V, IC=-2mA	125	-	475	
Small Signal Current Gain		hfe	VCE=-5V, IC=-2mA f=1kHz	130	-	500	
Base-Emitter Voltage		VBE	VCE=-5V, IC=-2mA	-600	-650	-750	V
			VCE=-5V, IC=-10mA	-	-	-820	
Collector-Emitter Saturation Voltage		VCE(sat)	IC=-10mA, IB=-0.5mA	-	-	-300	mV
			IC=-100mA, IB=-5mA	-	-	-650	
Base-Emitter Saturation Voltage		VBE(sat)	IC=-10mA, IB=-0.5mA	-	-700	-	mV
			IC=-100mA, IB=-5mA	-	-850	-	
Knee Voltage		VCEK	IC=-10mA, IB=Value for which IC=-11mA, at VCE=-1V	-	-250	-600	mV
Transition Frequency		fT	VCE=-5V, IC=-10mA	-	300	-	MHz
Collector Output Capacitance		Cob	VCE=-10V, f=1MHz	-	4.5	-	pF
Noise Figure		NF	VCE=-5V, IC=-0.2mA Rg=2kΩ, f=1kHz	-	1	4	dB
				-	1	4	
			VCE=-5V, IC=-0.2mA Rg=2kΩ, f=30Hz-15kHz	-	1.2	4	
				-	1.2	2	

Note: hFE Classification 559-A, 560-A : 125-250

559-B, 560-B : 220-475

Printed Circuit & Components Insertion



Some pictures:



This is my turntable (Oracle Delphi, SAEC 407/23 tonearm, Dynavector Karat 23R "Ruby" pickup) mounted on an "antisismic" support (a wood tablet filled with concrete and suspended). On the right side, the moving-coil preamp.



The power supply are two batteries in // with super-caps (1Farad), electrolytic capacitors (560'000uF) and several stages of various types and sizes of smaller caps until the high-speed polypropylene (Leclanché with extremely high slew-rate).

There is a two step charging procedure:

- 1) power ON through resistors to avoid high current appeals from the capacitors
- 2) when the caps are sufficiently charged, a second switch bypass the resistors.

On the back, you can see the banana connectors to charge the batteries.

This preamplifier weighs about 12kg.

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