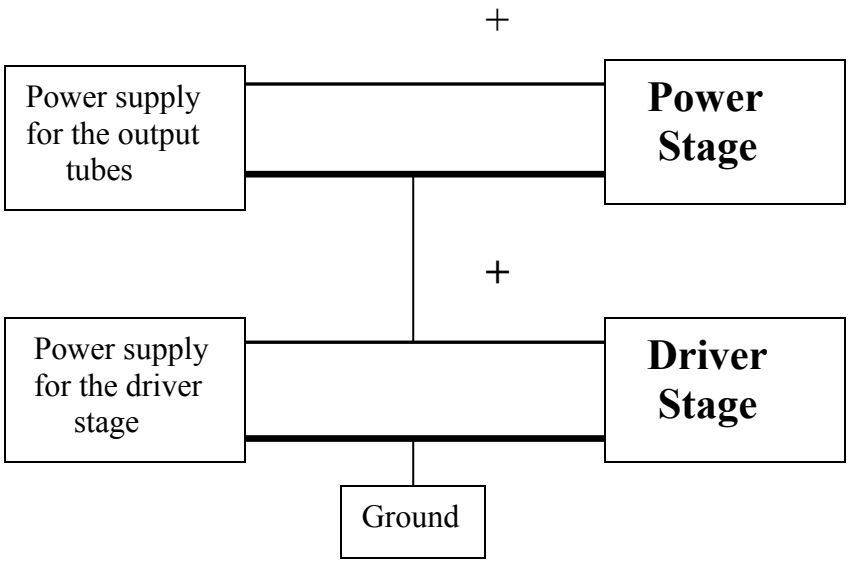
General guidelines for the DCMB (Direct Coupling Modulated Bias) system.

This circuitry has been developed as an alternative to the resistance/capacitance coupling layout, which has many drawbacks (discrimination between low and high frequencies, hence production of phase shifts due to different time constants, as well as slowing down the slew rate and reduction of the response to the transients) . No matter of how good quality the capacitor is, the electric laws apply and the result does not change significantly.
Before attempting to adopt the DCMB in your amplifiers' design or construction, please be ready to completely forget the usual resistance/capacitance coupling systems, as well as the current direct coupling ones. In most of the recurrent systems you generally have a common power supply for the gain (and eventually the phase splitters or inverters) and the power stages or, if you have more than one, their negative lines are connected together and grounded.
The above warning is therefore justified by the fact that :-

the milestone of the DCMB layout is the dual or <u>stacked</u> power supply units.

This is the compulsory condition for the DCMB to work.
The following block diagram shows the topology .



As you can see, only the negative line of the power supply of the drivers' stage is grounded, whereas the negative line of the Power supply of the output stages is not and it is connected to the positive line of the other power supply.
If, by mistake, you connect the negative line of the upper power supply to ground, you simply short circuit the lower power supply.
However, please do not get panicked, in my schematics, fuses are installed in the right places to avoid any damage.

With the above in mind , you can proceed to examining **Fig. 4**
This figure shows a concertina circuit, such as used in the Williamson (**Fig.1**), adopted in a DCMB layout. As the text of the schematics explains, the operation of the direct coupling is based on the anode load resistor of the driver stage, that is responsible for three functions :

a) supplying the bias to the output valve, negative to grid and positive to cathode, as required
b) transmitting the amplified signal to these electrodes

c) acting also as grid leak resistor

In other words : three in one.

But there is much, much more : in fact, there is no need of the blocking capacitor, thanks to the separated power supplies as described above.

Getting rid of this questionable component means a faster, cleaner, sensitive transfer of the sound to the power valves. **(#)**

Faster because of the shorter path.

Cleaner because there is no imperfect component to cross

Sensitive because it transfers every subtle detail, as well as the strong impulses, to the final stage. You can get an immediate confirmation in examining **Fig. 6** .

This topology has also a beneficial effect on the damping factor, as compared with power tubes circuits using cathode resistors to provide for the bias. Very often, the value of these power resistors is high and, if the plate current of the power tubes is also high, they "burn" a lot of power, generating heat. Also, they add extra resistance in the power valves' circuit and this results in a reduction of the damping factor.

As you know, a high damping factor means a better control of the loudspeakers with respect of their booming attitudes.

There are other possibilities connected with the DCMB, but they belong to an advanced stage that will be dealt with later on.

Glass Audio has published an article describing some of them .The magazine (17 novel circuits) can be purchased at Antique Electronics or can be loaded from Plitron.com site.

You can use the DCMB with Single Ended or Push-pull circuits.

After trying it with some Push-pull amplifiers, I decided in favour of the Single Ended topology because of the resulting simplicity and great sonic qualities.

Needless to say, I have avoided using pentodes in the driver stage as well as in the power stage, joining the team of the triode fans that believe in a better sound from the triodes, but also in consideration of the fact that a DCMB based amplifier is so honest that it cannot hide any incoming defect such as noise, scratches and distortions. Messy sources (lo-quality CDs for instance) are immediately revealed and, on the other hand, the hi-end recordings with wide dynamics and powerful transients are respected.

Ask for the Simplex (one 6SN7GT and one 6C33C-B per channel) 15 W – Single ended amplifier schematics or for the King III (one 6SN7GT and three paralleled 6C33s per channel) 50 W – Single ended schematics. The driver unit fitted on the above units is also suitable for 2A3, with some minor changes or for 300B triode single ended amplifiers.

More information is given in the set of figures.

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(#) **Fig. 2** gives you an idea of the components that can be suppressed from the Williamson amplifier without major inconveniences whilst **Fig. 3** shows how much simpler a DCMB circuit is..

See can examine also:

- **Fig. 5**
- **Fig. 5b**
- **Fig. 7**
- **Fig. 8**
- **Fig. 9**