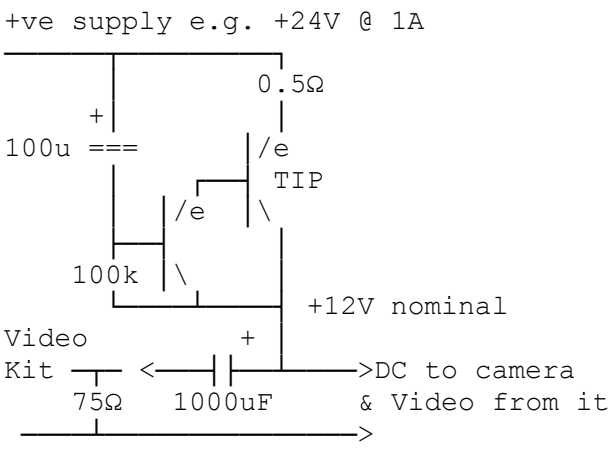
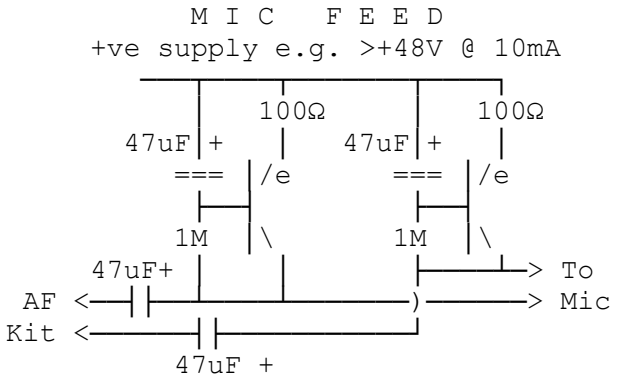
DC current sources for coax/AF.

By G8MNY (Updated May 09)
(8 Bit ASCII graphics use code page 437 or 850, Terminal Font)

HIGH Z CURRENT SOURCES.

There is a method often used for powering a TV camera over its video coax, where a choke feed that could be used in RF applications just won't work. Similar circuits can be used for balance mic lines were lossy resistor feeds are not wanted.



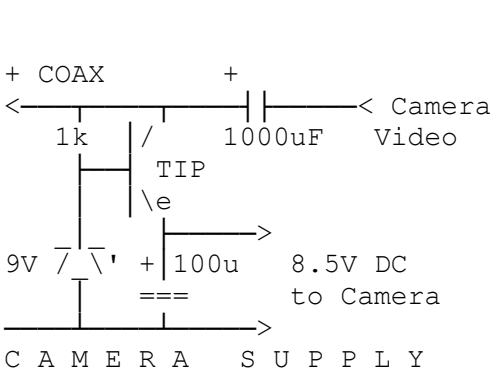


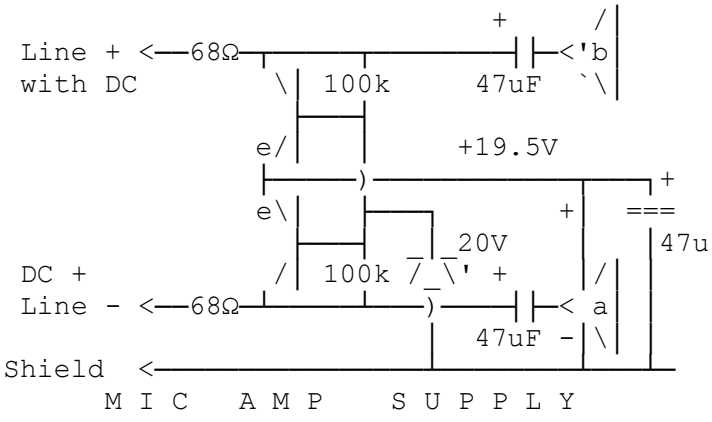
In the camera feed due to the high current a PNP darlington arrangement is used to amplify the DC through a 100k. The 100k value is dependent on the camera DC load & adjusted to get the working voltage e.g. 12V to the camera. The video can pass unimpaired as the 100uF decouples all the video frequencies from the current source, effectively making the power feed look like a resistor of 100k/(HFE1*HFE2) + a huge AC choke where Xl = (HFE1*HFE2)/Xc. The emitter R increases the voltage swing for any current changed making it more linear & maintaining a high collector Z (constant current).

The Mic circuit is much the same but no darlington needed as lower current, but low noise transistors needed for a balanced or single ended line. Power rail hum decoupling is not really needed in either of these circuits.

HIGH Z DC LOADS.

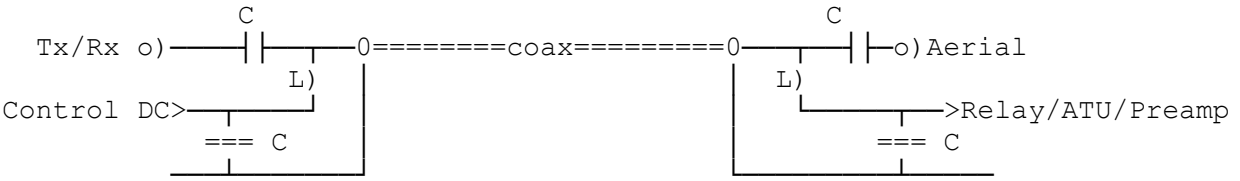
To extract the line DC a reverse circuit is used normally with a regulator. Some regulator IC can be used, providing they are not unstable with no input Caps.





For mic preamps just 2 Rs are often used to feed the decoupled rail for the preamp ICs & no transistors, but these circuits are better!

RF APPLICATIONS
For a fixed frequency or band of frequencies (HF) often a choke & capacitors will do to isolate a DC path from RF.



C must be big so that Xc < Z (2x 50Ω) e.g. Xc < 10Ω @ the lowest frequency.

L must be large so the Xl > Z (50Ω/2) e.g. Xl > 250Ω @ the lowest frequency. Also L must not reduce inductance @ DC load (e.g. ferrite/iron dust may do), and the L must not over heat carrying the DC or the RF & must not have multi wavelength resonances in it's winding!

For VHF & UHF the C & L are quite small, but must be laid out leadless to reduce the RF loss.

See also "Phantom Bal Mic Preamp+Gun Mic" bul.

Why don't U send an interesting bul?

73 De John, G8MNY @ GB7CIP