Subject: Re: Feedback
Posted by metasonix on Thu, 03 Jun 2004 03:44:44 GMT
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>Such simple circuits have fixed gain of hfe or muNot in typical RC-coupled circuits. An active plate or collector load or else a coupling transformer or choke is required to get the full device gain as voltage gain.>Some biasing components will introduce negative feedback when >signal current flows through them causing a voltage drop that >biases the active device in a negative directionSometimes called degenerative feedback.>Global positive feedback was used in old radio circuits >called "regenerative" receivers. Hetrodyne and Superhetrodyne >circuits made them obsolete. In most radio receivers, yes. But simpler TRF and regen circuits are still seen today, esp. in specialized applications.Feedback is a well-understood mechanism. If used properly, it is an extremely useful tool. But no tool is perfect. (That's what decent engineering textbooks usually say.)Feedback, not carefully implemented, can cause phase margin errors at the frequency-response extremes. It can cause the amp to be slightly unstable with some load impedances (esp. certain costly monkey-coffin speakers with complex crossovers).I once saw a Kenwood receiver, brand new out of the box, whose power amp oscillated at ~ 4 MHz--regardless of the load placed on it or the source material. It made a pretty good shortwave jammer, when hooked to a speaker with a long cable. They sold tens of thousands of that model line circa 1990. As a special bonus, each channel oscillated at a slightly different frequency--giving some truly unpleasant IM distortion. Most customers were perfectly happy with them....they were quite unreliable, though, for an obvious reason. So one hopes that line, probably designed by a junior engineer at the factory (typical Japanese practice), is in the landfill. But don't think that'll be the last one!The advantage of tube amplifiers is primarily in two areas:1) low distortion of many triodes (and even some pentodes) allows the design of low feedback circuits;2) tubes do not (usually) have slew-rate issues, and they never have voltage variable device capacitances, which semiconductors often have--in abundance, esp. in cheap devices intended for audio use.And tubes still find a home in audio equipment because:3) feedback has been (and still is) misused in solid-state amps.The problem does not lie in the evil of feedback; the problem is inside the heads of arrogant, self-important design engineers who successfully managed to campaign in the 1960s and 70s that high-feedback transistor amps gave perfect sound. They often did not, and even today mid-fi amplifiers and professional sound reinforcement amps often have horrible feedback implementations.A few names come to mind. Names like Bob Pease....Don Lancaster....If an amp doesn't sound good, I recommend finding the little dweeb who designed it, and kicking his ass. No, wait, better yet, find the bastard who hired him, and kick THAT GUY'S ass. I would be so happy if more audiophiles actually removed their swollen little heads from their buttholes, and started boycotting inferior products. But since most can't seem to agree on what good sound is, I'm not gonna wait around for it. Prefer to talk to the minority who actually listens carefully.(sorry, that probably leaves out most of the SE-triode mafia--they often listen to amps that sound worse then cheap table radios...)