



CIRCUIT DESCRIPTION

This discussion is limited to one amplifier channel. The other channel of the same module operates identically.

TURN-ON DELAY

Forward biasing of driver-output transistors Q817 and Q819 is momentarily delayed to eliminate audible turn-on transients generated by the input differential amplifier. When the receiver is turned on, C824 begins to charge through R817, R819, and CR821. When the voltage at the anode of CR817 rises to +1.8V, CR817, Q817, and Q819 become forward biased. (Output bias current flows through R817, R819, CR817, Q817, R845, R847, Q819, Q809, R805, and R808). CR821 becomes back-biased as C824 charges to a maximum of +35V through R861. After CR821 back-biases, the turn-on delay circuit has no effect on amplifier operation. When the receiver is turned off, CR823 rapidly discharges C824.

IDLING CURRENT REGULATOR

Transistor Q811 is adjusted to a fixed DC conduction by R827, maintaining a constant DC voltage between the bases of Q817 and Q819. This voltage determines the idling current through Q817, R845, R847, and Q819. The low internal impedance of Q811 has negligible effect on the AC drive fed to Q817. Capacitor C811 is connected to the output and boot-straps the bias circuit to provide extra drive to Q817 on positive swings.

OUTPUT OVERLOAD LIMITER

When load demands are excessive, Q813 shunts AC drive from the base of Q817. During normal operation, Q813 is biased below the conduction point. Network R837/R839 functions primarily to sense current through Q817. The primary function of divider R831/R839 is to sense voltage across Q817. Simultaneous voltage and current sensing, permits Q813 to restrict the operation of Q817 to the safe operating area. Similarly, Q815 restricts operation of Q819 to the safe operating area. C817 and C819 suppress oscillation of Q813 and Q815 at the limiting threshold. Under output short-circuit conditions, CR803 protects the collector-to-base junction of Q813 from negative bias during negative signal swings. Similarly, CR805 protects the collector-to-base junction of Q815 on positive signal swings.

PREDRIVER LIMITER

Up to moderate overloads, Q807 remains shut off and has no effect on circuit operation. Under very high overload conditions; the voltage across R805 forward biases Q807, and signal is shunted from the base of Q809, protecting it from excessive current.

AUTO SHUTDOWN

This circuit has no effect on the amplifier during normal operation. When the amplifier is overloaded, Q813 conducts on positive swings and current flows from B+ (pin AA) through R853, R856, and CR819. The voltage drop across R853 is applied to C823 through R857. The duty-cycle of Q813 determines the charge and discharge rate of C823. For the auto shutdown circuit to operate, C823 must charge to approximately 0.6V which forward biases Q821 and connects divider R854/R855 between the B+ and B- supplies. The voltage drop across R855 forward biases Q822 which forces Q821 and Q822 to saturate and latch. This condition causes CR813 and CR815 to forward bias and shut off Q805, Q817, and Q819, thereby disabling the amplifier. Whenever either channel causes the auto shutdown circuit to latch, both amplifiers are shut down. The customer must turn off the receiver for 30 seconds or more to permit C823 to discharge sufficiently for Q821 and Q822 to unlatch.