

MASTR III Operational Description

Power control of the MASTR III Power Amplifier is accomplished with a feedback control loop. The three possible feedback signals are: representation of forward power, temperature sensitive scaled representation of forward power, or representation of reflected power. The three signals are input to a diode summing junction which selects the largest of the three for use as the feedback.

The microstrip directional coupler samples the output power and produces a voltage, V_f , proportional to the forward output power. The power control compares the forward voltage, V_f , to a reference voltage at U3. The output of U3 adjusts the control voltage at pin 5 of the MMIC of the Small Signal Gain Stage. This varies the gain through the stage, and controls the power output level of the Power Amplifier Assembly.

During over temperature operation, a scaled representation of the forward power is maintained constant by varying the control voltage line. Thermal resistor RT1 sensing an increase in temperature causes the output of U1.1 to increase. If the output of U1.1 becomes larger than the other feedback lines, the output of U3.2 will begin to decrease. This causes the gain of U101 to decrease. Since the scaling is a function of temperature the power is reduced as the temperature increases.

Under VSWR cutback operation the reverse voltage, V_r , representative of the reflected output power is held below a threshold by reducing the control voltage as necessary. If V_r increases at U1.2 beyond the preset threshold an increase at U3.2 will result. This causes a subsequent reduction in the control voltage to U1. Thus the power control circuit reduces the output power in order to limit the reflected power to 25% of the set power.

Mark II Upgrade Kit Operational Description

The MARKII Power amplifier amplifies a +5dbm signal to a +43dbm signal from 850MHz to 870MHz providing a bandwidth of 20MHz and gain of about 38db. It replaces another module in the MasterIII PA which is no longer available.