Circuit Description

General

The FM250E is housed in a 3U (5.25”), 19” rack-mounting case. Internally there are 4 PCB assemblies and 2 cased power supplies.

Functional

Two 24V power supplies are connected in series to provide 48V for the power amplifier and 24V of the exciter and fan.

Audio inputs (SCA Composite and Mono) are connected directly to the exciter board, premphasis is applied to the mono channel only. These input are then summed together and feed to a veractor diode used to tune the VCO (voltage controlled oscillator). A sample of the VCO’s output frequency is used by a synthesizer to compare again a reference oscillator. This generates an error voltage which is used to tune additional veractor diodes in the VCO to maintain a constant frequency. The main output from the VCO is amplified up to 25W.

The output from the exciter board is used to drive the power amplifier to 300W. Integral to the power amplifier is a harmonic filter used to reduce harmonics generated in the power amplifier to acceptable levels. This output is then feed back to the exciter board and on to the output connecter via a forward and reverse power detector.

The exciter board also contains control circuitry, which levels the output power to a level set by a reference voltage. The detected forward power and reverse power are summed and compared to the reference voltage. The gain of the reverse power path is 10 times that of the forward power. This ensures that should the load be remove the forward power will be reduced to a safe level.

The reference voltage used by the control circuit is generated by a microprocessor. This value can be changed by using the up/down control on the front panel or by remote contact closure from the rear panel accessory connectors. The microprocessor also feeds the frequency information to the synthesizer.

Metering on the from panel is a multimeter, each function is selected by a rotary switch. The voltages for Current and voltage are provided by the PSU metering board, forward and revere voltages by the synthesizer board. All these voltages are also connected to the rear panel for remote metering.

Mounted on the exciter board is a magnetically latched relay used for remote on/off functions. This requires only a momentary contact closure for either on or off. Cycling the AC power will not change the state of this relay.