

Operational Description

Frequency Stabilization

It's a PLL circuitry incorporating a Philips UMA1018 synthesizer and a Samsung TCXO of 13.000 MHz. See part numbers in Bill of Materials. See B5 and C5 of page 7 of the schematic. See also page 5 of the schematic for the Local Oscillator.

Suppression of Spurious Radiation

A comprehensive output filter consisting of 3 resonators and additional components (page 1 of the schematic) suppresses spurious radiation. Filtering of all frequencies is done before the mixers. (See page 3 of the schematic).

Modulation Limiting

Modulation is completely controlled by the micro controller and firmware and is very exact. Modulation cannot be changed without changes in the firmware. We use a Numeric controlled oscillator to generate the FSK modulation. We have both a description of the modulator (page 12 of the schematics) and the design equations.

Power Limiting

The equipment is tested with input voltages to fit inside the maximum output power that is allowed in Part90. <120 mW. However the supply voltage is controlled in the terminal side (control unit operated by the user). We do have a power off situation at 6.8 Volts controlled by the internal processor of the equipment. On the receiver side (the equipment at the machine side) we have a controlled voltage (8.4V +-5%). On the battery operated part we do have a max. voltage of 7.9V (8.4V – diode drop) and a power down at 6.8 Volts. Power ratio related to temperatures is not easy to control with this construction of the PA. Measurements on amplifiers from different production batches shows that the output power measured on the RF connector is between 7-80 mW within the voltage range 6.8-8.4V and within the working temperature range. See specification “SP-01-007” On our newest designs (example MC-3-5) we have made a power limiting function by restricting the input voltage. This limits the maximum output power to 10-15 mW.