

THEORY OF OPERATION

The SD 125V3 radio is comprised of two PCB's (an RF PCB and a digital PCB). These boards are connected with an 18 pin female and male connector. The digital board is interfaced with external data equipment through the 9 pin d-sub male connector, which controls the radio and data receiving and sending.

DIGITAL CIRCUIT

The digital circuit is charged to be control for all of the signal path and set the frequencies to be set and selecting the desired channel.

TX-Signal circuit

The TX data signal comes from Pin 2 of Con 401, and goes through U404D. The TX-signal is amplified by U406C. The TX-signal is filtered by U405A & B which is a 4'th order low pass filter, therefore, the filtered signal supply to the RF board for TX modulation.

RX-Signal Circuit

The RX- data signal comes from the RF board, which is connected with pin 10 of Con 403. The RX-signal is switched by U404A and adjusted by RV403 and amplified by U407. The amplified signal goes to pin10 of Con 401.

RSSI Detector

From the RF board, the RSSI (Received Signal Strength Indicator) signal comes to U403A & B through R461. The pulse is injected from pin 5 of U403B every 1 ms and C451 is discharged. After then, it begins to be charged by R464. Simultaneously, RSSI signal is input to pin 7 of U403A and those signals are compared. The compared signal is output from U403A. Pin 1 and the CPU detects the pulse width. The pulse width is varied by RSSI DC voltage. Therefore, the CPU determines the carrier detection .

EEPROM

RX, TX channel and RSSI detection level as well as other data from the programmer are stored in the EEPROM. The data stored is retained without power supplied. This is a non-volatile memory . The EEPROM may have information re-programmed or erased. U402 is an EEPROM with 2048 capacity and data is written and read serially.

Channel Selector

One of 16 channels may be selected using the clip switch named SW401 . SW401 encodes the channel number, selected into 4-bit binary code. The binary code plus one equals the channel number. The binary code is decoded by the CPU enabling the appropriate RX or TX frequency and associated data to be selected from the EEPROM. In the binary bit of SW401, the lower 2 bits are connected to Con402. It causes the low 4 channels to be selected from the external equipment's.

DC to DC Converter

The main DC power is injected to the DC to DC converter . The DC to DC converter regulates the various input power supply voltage and outputs a constant voltage of 7.5 Volts. It is a source for all of the RF and digital circuits.

The DC to DC converter is formed by U801, Q801, Q802, L801 and R804. U801 is a switch mode DC to DC Converter IC. Input DC various appears as a voltage various through R804. U801 detects the voltage and controls the switching pulse. As the switching pulses, Q801and Q802 switches the input DC of various supply voltages and generates the constant DC of supply voltage.