

9. CIRCUIT DESCRIPTION

1) Transmitter section

FM modulated output from the VCO which is transmitting frequency is fed to an 3-stage amplifier followed by the antenna matching circuit and Low Pass Filter and transferred to Antenna.

- 1.1 To turn the PA (Power Amp.) on, Press and Hold on the PTT (Push-To-Talk) switch.

CPU controls Q501 (VCO power supply switching transistor) and Q503-PA amplifier (Q311, Q321, Q331) and diode (D331, D211) bias switching transistor. The PA's is a broadband 3-stage transistor amplifier. D204 is for temperature compensation of Q331.

- 1.2 MIC Amp. Pre-emphasis and Audio limiter.

U701-A is MIC amplifier which has 14.5 dB gain and Pre-emphasis Amp (6 dB/oct, 300 Hz ~ 2.5 kHz). U701-B is audio limiter to protect over-deviation (max deviation : 2.5 MHz).

- 1.3 Low Pass Filter (3 kHz ~ 20 kHz).

U801-D is Low Pass Filter with 20 dB/oct slope at 2.7 kHz ~ 20 kHz. This is for eliminating the unwanted high audio frequency (3 kHz ~ 20 kHz) modulation to meet the occupied band width.

- 1.4 CTCSS Band Rejection Filter (HPF)

This filter is for rejecting CTCSS band (67 Hz ~ 250 Hz) from MIC amplifier. Otherwise CTCSS tone will be mixed with voice and fed to VCO modulation input. Then, the receiving set has a trouble in decoding CTCSS tone from the signal mixed with voice.

CTCSS tone is generated at CPU using digital to analog converter method and fed to modulator via LPF(Low Pass Filter : 3 kHz ~ 20 kHz).

2) Receiver Section

- 2.1 Signal from Antenna is amplified via Q211 and filtered F211 (Saw. 465 MHz).

- 2.2 The amplified signal is mixed with 1st LOCAL driven by VCO-1 (FRS 443 M).

- 2.3 1st IF 21.7 MHz is filtered by X-tal filter and amplified for 2nd mixer.

- 2.4 2nd mixer output is 450 kHz. The 2nd LOCAL is driven by PLL X-tal oscillator via inner buffer

Amp.

2.5 **M201 IF IC** demodulates audio. The High Frequency Audio Band is amplified by built-in OP-Amp in **U201** and rectified to **PC** (0.7 ~ 1 V) to control scan control in **M801**. This is for detecting receiving signal. Scan control output is fed to CPU to turn speaker On/Off.

2.6 The audio also amplified by **U801-A** filtered by **M701-C** (LPF 250 MHz, CTCSS) and is shaped digital signal and delivered to CPU.

2.7 The amplified audio by **M801-A** is filtered by HPF **M801-B**, **M801-C** to eliminate CTCSS tone to speaker.

Finally, received signal is filtered by **U801-D** (3 kHz ~ 20 kHz) and drive speaker Amp (**U602**).