



8. ALIGNMENT INSTRUCTIONS

7-1. Circuit Composition and Operation Theory

The basic explanation for the circuit composition FRS-1000 consists mainly of the one board controlling the analog circuit parts and the digital circuit parts for the other control.

7-2. Receiver

FRS-1000 transmission parts is composed in the double conversion system, which has the 1st IF frequency of double 21.7 MHz and the 2nd IF frequency of 450 KHz. With the RF fronted which has an excellent band characteristics and skirt characteristics, the 2 pole MCF used in the 1st IF, and the 3 pole ceramic filter in the 2nd IF, the reception interrupting factors such as the image and the sensitivity repression are reduced for the more stable reception.

7-2-1. RF Front-end

The signal received by the antenna will be transmitted to the band pass filter through the antenna switching circuit consisted of L607, C613, D601. The front RF amplifier transistor Q1 consists of the C2, C3, C4, input band pass filter and SAW1 output band pass filter, primarily diminishes the other signal rather than the 1st IF image and other signal within the reception band and amplifier only the necessary signal within the RF

7-2-2. 1st Mixer

The receiver which has been amplifier in the RF front-end is provided to the base of the 1st mixer Q2. The 1st L/O signal provide from the VCO is supplied to the emitter of Q2 and Converted to the 1st IF 21.7 MHz

7-2-3. 1st IF Filter and 1st IF Amplifier

The signal covered by Q2 to 21.7 MHz, the 1st frequency, change its impedance through C17, L7 and then is infused to the fundamental MCF which has the center frequency of 21.7 MHz and the width of +/- 3.75 KHz.

Here, the signal reduces the image and other unwanted signal for the 2nd IF, and changes its impedance again through the R11. Then the signal is infused to the Q5, the 1st IF amplifier. The signal infused to the Q3 is amplifier approximately by 20 dB in order to acquire the required reception sensitivity, and infused to the IC1 which functions as the 2nd mixer, the 2nd IF amplifier, and the FM detector.

7-2-4. 2nd Mixer, and IF, FM Detector (IC1)

The receiver IF signal of 21.7 MHz, which has been infused to IC1 is mixed with the 2nd L/O converted to 450 KHz, the 2nd IF frequency. The receiver signal converted to the 2nd IF signal frequency passed through the CF2, the ceramic filter of 450 KHz again. After the limiting inside the IC1 and the FM demodulating by the quadrature detector inside the IC1, the signal offers the output through the 9th pin of IC1.

The squelch circuit is composed to detect the noises from the received signal demodulate in the 9th pin of the IC1. For this purpose, the noise filter is using the OP amplifier inside the IC1.