

TK-3102/TK-3107 CIRCUIT DESCRIPTION

The KENWOOD model TK-3102 and TK-3107 are UHF/FM hand-held transceiver designed to operate in the frequency range of 406 to 430MHz. The unit consists of a receiver, a transmitter, a phase-locked loop (PLL) frequency synthesizer, a digital control circuit, power supply circuit and a signaling circuit. TK-3107 is 16 Number of Channels, and TK-3102 Number of Channels.

1. RECEIVER CIRCUIT

The receiver is double conversion superheterodyne, designed to operate in the frequency range of 406 to 430MHz.

1.1 FRONT-END RF AMPLIFIER

An incoming signal from the antenna is applied to on RF amplifier (Q203) after passing through a transmit/receive switch circuit (D102 and D103 are off) and a 3-pole LC filter. After the signal is amplified (Q203), the signal is filtered by a 3-pole LC filter to eliminate unwanted signals before it is passed to the first mixer.

1.2 FIRST MIXER

The signal from the RF amplifier is heterodyned with the first local oscillator signal from the PLL frequency synthesizer circuit at the first mixer (Q202) to become a 38.85MHz first intermediate frequency (1st IF) signal. The first IF signal is fed through two monolithic crystal filters (MCFs:XF200) to further remove spurious signals.

1.3 IF AMPLIFIER

The first IF signal is amplified by Q201, and then enters IC200 (FM processing IC). The signal is heterodyned again with a second local oscillator signal within IC200 to become a 450kHz second IF signal. The second IF signal is fed through a 450kHz ceramic filter to further eliminate unwanted signals before it is amplified and FM detected in IC200.

1.4 AUDIO AMPLIFIER

The recovered audio signal obtained from IC200 is amplified by IC300 (1/4) low pass-filter by IC300(2/4) and high-pass filtered by Q300 (3/4) and Q300 (4/4), and de-emphasized by R303 and C306. The audio signal is then passed through an audio frequency switch (Q303). The processed audio signal passes through an audio volume control and is amplified to a sufficient level to drive a loud speaker by an audio power amplifier (IC302).

1.5 SQUELCH AND MUTE CIRCUIT

The output signal from the squelch circuit, which consists of IC200, is applied to the microprocessor. The microprocessor controls the mute control line (MUTE) according to the input signal and the microprocessor task condition.

2. TRANSMITTER

2.1 MICROPHONE CIRCUIT

2-1 Tuning Mode

Starting Tuning Mode from Test Mode.

2-1-1 Press the [F10] during the TEST MODE CHANNEL & SIGNALING MODE then starting Tuning Mode and message Window open.

Tuning Mode
Frequency Tune
RF Power
Battery
Squelch(Tight)
Squelch(Open)
QT Deviation(Wide)
DQT Deviation(Wide)
QT Deviation(Narrow)
DQT Deviation(Narrow)

2-1-2 Use [↓][↑]keys select tuning item[Frequency Tune]then press [Enter].

2-1-3 Use [←][→]keys to adjust the level then press [Enter].

2-1-4 Select tuning item [RF Power]then press [Enter].

2-1-5 Use [←][→]keys to adjust the level then press[Enter].

2-1-6 Select tuning item[BATTERY] then press [Enter].

2-1-7 Use [←][→]keys to adjust the level then press [Enter].

2-1-8 Select tuning item [Squelch(Tight)]then press [Enter].

2-1-9 Use [←][→]keys to adjust the level then press [Enter].

2-1-10 Select tuning item [Squelch(Open)] then press [Enter].

2-1-11 Use [←][→]keys to adjust the level then press [Enter].

2-1-12 Select tuning item [QT Deviation(Wide)] then press [Enter].

2-1-13 Use [←][→]keys to adjust the level then press [Enter].

2-1-14 Select tuning item [DQT Deviation(Wide)] then press [Enter].

2-1-15 Use [←][→]keys to adjust the level then press [Enter].

2-1-16 Select tuning item [QT Deviation(Narrow)] then press [Enter].

2-1-17 Use [←][→]keys to adjust the level then press [Enter].

2-1-18 Select tuning item [DQT Deviation(Narrow)]then press [Enter].

2-1-19 Use [←][→]keys to adjust the level then press [Enter].