

## **CIRCUIT DESCRIPTION of ICB-U655**

ICB-U655 is a FRS(Family Radio Service) Tranceiver with 14 radio channels.

|     |             |      |             |
|-----|-------------|------|-------------|
| 1ch | 462.5625MHz | 8ch  | 467.5625MHz |
| 2ch | 462.5875MHz | 9ch  | 467.5875MHz |
| 3ch | 462.6125MHz | 10ch | 467.6125MHz |
| 4ch | 462.6375MHz | 11ch | 467.6375MHz |
| 5ch | 462.6625MHz | 12ch | 467.6625MHz |
| 6ch | 462.6875MHz | 13ch | 467.6875MHz |
| 7ch | 462.7125MHz | 14ch | 467.7125MHz |

### Part RX

Circuit system of ICB-U655(Part RX) is double conversion superheterodyne (lower heterodyne). An incoming RF signal received through the Antenna goes through the antenna switch (D1, D2, and D3) and is amplified at the RF Amplifier (Q1). The signal is converted to a first Intermediate Frequency (IF:21.7MHz) at a first mixer (IC1). The first Local Oscillator is a Phase Locked Loop (PLL) synthesized oscillator being varactor tuned, which is variable between 440.8625MHz to 446.0125MHz in RX mode. The first mixer is a Double Balanced Mixer (DBM). The first IF signal is amplified at a IF amplifier (Q2) and is converted to the second IF of 450kHz at a second Mixer in the IF IC (IC2). The second IF signal is demodulated at a FM demodulator in the IF IC (IC2). The demodulated signal input to the Tone generator/detector IC (IC109) by which the tone squelch circuit, de-emphasis, and HPF combine, and the tone squelch signal and AF (Audio Frequency) signal are separated in IC109. The AF signal is amplified at an AF Amplifier (IC102) and a Speaker connected to the AF Amplifier. Finally, the audible signal is heard through a internal speaker.

## Part TX

Circuit system of ICB-U655(Part TX) is Narrow band FM with varactor modulation. The frequency is made with Phase Locked Loop (PLL) synthesized oscillator composed of VCO1 and IC3, and will take a route to Q3, Q4, Q5, Q6 (P.A), Low Pass Filter and finally to the Antenna for the transmission. The transmission frequency is made by standard oscillator (Crystal Oscillator :X1 21.25MHz) and is adjusted by trimmer capacitor (C53). The transmission output is composed of the method of limiting the voltage given to Q4, Q5, and Q6, and is adjusted by RV107. The voltage limitation is controlled with IC103, Q124, and Q125. The aural signal picked up with the microphone (MIC101) is amplified by Q118 and sent to IC106. Amplifies, and pre-emphasis, LPF, and Modulation limit amplifier are composed in IC106. The IC106 output is adjusted maximum frequency deviation with RV103 to becoming in the standard, and is sent to varactor in VCO1 through LPF. Finally, modulated wave is transmitted through Antenna.

## SEARCH SYSTEM

At the standby

The channel is scanned while confirming whether there are both the 1kHz and the tone signal. The tone signal is CTCSS(Continuous Tone Controlled Sub-audible Squelch) signal set beforehand. When both 1kHz and the tone signal are detected, the scanning is stop. The 1kHz signal through the Amplifier (Q101) and the Schmitt-trigger (Q102, Q103) is sent to the System Controller (IC101). The 1kHz signal is detected by the System Controller and the tone signal is detected by IC109.

FCC ID : AK8NTM30

Model : NTM-30

#### At the call

The call operation starts when PTT is pushed at the standby mode. The call signal transmits automatically with an empty channel. The signal which is modulated by 1kHz and the tone signal is transmitted for several seconds. The 1kHz signal is generated by the System Controller and the tone signal is generated by IC109. The tone signal is CTCSS signal set beforehand. If there is no response for about ten seconds after call signal is transmitted, the unit returns to the standby mode.