

## **CIRCUIT DESCRIPTION of NTM-900**

NTM-900 is made up from a pair of components, which are a transmitter(TX) and receiver(RX). So, though FCC application of Certification is only applied for TX of NTM-900, explanation of TX and RX are described on "Circuit Description".

### Transmitter(TX) part

Configuration : crystal-controlled PLL circuit

Transmitting frequency of the TX has 9 channels (please refer to the below). The channel is manually selected by SW302 and SW304.

1ch	902.200MHz	6ch	903.300MHz
2ch	902.300MHz	7ch	904.100MHz
3ch	902.400MHz	8ch	904.200MHz
4ch	903.100MHz	9ch	904.300MHz
5ch	903.200MHz		

### Signal-flow path

After IC301 get selected channel signal (which is occurred by SW302 and SW304) through IC302, fundamental frequency is oscillated by Phase Locked Loop circuit (IC301, Q302, D301 and Low Pass Filter). Range of the frequency is 451.1MHz to 452.150MHz. And, second harmonic frequency only of it is amplified by Q301. The frequency(902.2MHz - 904.3MHz) will take a route to FL301(Band Pass Filter), and finally to the Antenna for the transmission.

### MIC amplifier

Voice sound picked up through the MIC will be amplified by Amplifier of IC301, then the sound will be injected to the D301(Variable Capacitor diode) and FM modulation is conducted.

### Voltage stabilizer circuit

Floating voltage will be stabilized on Q305 and D302.

### Receiver(RX) part

Configuration : crystal-controlled PLL circuit

Receiving frequency of the RX has 9 channels (please refer to the below). The channel is manually selected by SW2 and SW4. That receiving type is Lower Heterodyne with Intermediate Frequency (IF) of 10.7MHz.

1ch 902.200MHz	6ch 903.300MHz
2ch 902.300MHz	7ch 904.100MHz
3ch 902.400MHz	8ch 904.200MHz
4ch 903.100MHz	9ch 904.300MHz
5ch 903.200MHz	

### Signal-flow path

A RF-signal received through the antenna will take a route from Q1(RF Amp) to Q2(MIX), FL2 and FL3(Band pass filter), IC1(IF-Amp, Quad detector, Pre-Amp, Expander) and IC6(AF power amp), and finally to speaker. Fundamental frequency(445.750MHz- 446.8MHz) is made by Phase Locked Loop circuit (IC1, Q3, D1 and Low Pass Filter). And, second harmonic frequency(891.5MHz- 893.6MHz) of it will take a route to Q2(MIX).

### Sound monitor

A part of AF signal is branched to Q4(Amp) and the signal is converted to DC voltage. CPU(IC2) reads the DC voltage level and illuminate LEDs(D6-D10).

### Voice activated system

In case AF signal can not be detected for 5 seconds, sound is muted by Q5, Q6, Q7 and Q8 until next AF signal can be detected.

### Range alarm

When AF signal can not be detected (e.g. : reciever is out of area etc.), the device turns the light(D5) on and off, and beep sound is sounded from the speaker.

### Battery monitor

When battery voltage level is down, the device turns the light(D4) on and off, and beep sound is sounded form the speaker. Then the power supply is automatically stopped.