

General Information and operation of TX & RX

1. General information

A. TX

Equipment under test	R.A.P.T. 14xx
Model name	R.A.P.T. 1400
Variant model name	R.A.P.T. 1400 CoverUP, R.A.P.T. 1400 Elite, R.A.P.T. 1450, R.A.P.T. 1450 CoverUP, R.A.P.T. 1450 Elite
Serial number	*****
Frequency range	26.995MHz
Modulation technique	ASK
Number of channels	1
Antenna type	Connector type(Coil antenna)
Power source	DC 9.0V(Alkaline Battery)

B. RX

Equipment under test	R.A.P.T. 14xx
Model name	R.A.P.T. 1400 RX
Variant model name	R.A.P.T. 1400 CoverUP Rx, R.A.P.T. 1400 Elite Rx, R.A.P.T. 1450 Rx, R.A.P.T. 1450 CoverUP Rx
Serial number	*****
Frequency range	26.995MHz (Rx)
Modulation technique	ASK
Number of channels	1
Antenna type	Fixed type(Wire antenna)
Power source	DC 4.8V(Ni-MH Batteries)

2. Test frequency

	Low channel	Middle channel	High channel
Frequency(MHz)	26.995	-	-

3. Operations

A. TX

i. Electric Voltage

- Use 9V-DC Alkaline battery.

ii. Operations(TX)

1. Digital Board

- Once the power switch is ON, 9VDC electric voltage which is provided from 9VDC battery will be 5VDC thorough regulator which is installed on the board.
- 5VDC electric voltage will provide the power to microprocessor of the PCB, RF oscillator of RF board and 1st RF amplifier.
- LED will operate only when the switch is ON. When the unit is normal, it will always ON and when low battery, it will flash for 5 seconds after power OFF.
- 3 DOGS switch determines the ID of transmitter. In other words, the location of switch knob indicates their ID according to the location(left, center, right).
- The Intensity has 16 levels(from1 to 16) and has each different signal. The receiver which receives the signal from Transmitter generates the shock voltage.
- Once a switch is pushed, a regulator operates and makes 5VDC. The microprocessor provided 5VDC searches both dog switch and intensity level switch if Nick or Continuous switch is pushed. And if vibration switch is pushed, it searches dog switch only and send the optimal signal to RF modulation.

2. RF Board

- A square wave from microprocessor will be modulated at oscillator that consists of Crystals(26.995MHz) and TRs.
- The oscillator will oscillate when Power is provided, then the signal

oscillated will be provided to the 1st amplifier.

- The signal from 1st amplifier will be amplified by the 1st amplifier(2SC4226), and then the signal that amplified by the final amplifier(2SC4272) will be radiated through an antenna.
- A ground system has its own ground method.

iii. Operations(RX)

1. Main Board

- Charging process
 - i. It will be provide 12VDC from a charger.
 - ii. It will charge the battery as the charging circuit changes.
 - iii. When charging, it will not operate.
- Operation
 - i. The electric power will be changed to 3.3VDC through a regulator and be provided to the microprocessor. The microprocessor will adjust the regulator so as to provide the voltage continuously.
 - ii. The receive will get a signal from a Rx modulator.
 - iii. When low battery, it will send the signal to the microprocessor.

2. RX module

- The signal(26.995MHz) from a transmitter goes to a low filter(28MHz) and will be amplified by an amplifier.
- A mixed circuit will change the 1st 16.295MHz signal to 10.7MHz signal.
- Then the signal of 10.7MHz will be input to 'IF IC(NJM2527V)' through a 10.7MHz ceramic filter(NJM2537V).
- The 'IF IC(NJM2537V)' will make 455KHz signal, and pass 455KHz filer, finally get audio signal.

- This audio signal passes RC filter and becomes pure signal, then make a square wave using signal from transmitter. The square wave will be input to the microprocessor on the main PCB.