

## **1. GENERAL**

### **1-1 Introduction**

The HKP Corp. HKM-1002 is MURS handheld two-way radio VHF transceiver.

The transceiver has 5 Channels and 10 weather channels. Weather channels can also be accessed immediately by pressing the Function key.

The radio is the newest generation in personal two way communications.

The radio is a lightweight, compact two way communication device that can be used to communicate with family or friends at parks, shopping malls, sporting events, concerts-any indoor or activity!

### **1-2 CHARACTERISTIC**

- 1) All active devices in the radio are composed of semiconductor and high density IC.
- 2) To design the radio in compact and weight approximately 120g without battery.
- 3) Micro-computer of the radio is Upd789418A by NEC
- 4) Its DC supply power can operate by use of alkaline 4 Cell (1.5V AAA) battery.

### **1-3 COMPOSITION**

The radio is composed of following.

- 1) Transceiver (W/Antenna)
- 2) Belt clip
- 3) Manual

## **2. SPECIFICATIONS**

## General

Frequency Range	151.820 – 154.600Mhz
Channels	5CH
Privacy Codes	38 for each main channel
Dimensions (W x H x D)	63mm x 120mm x 35mm

## Power Supply

Power Source	Alkaline Batteries, AA(4), 6VDC
Operating Time	26 Hours (Alkaline Batteries; 5:5:90) 70 Hours ( Standby )

## Receiver

Useable Sensitivity	> -120 dBm
Maximum Audio Output Power	> 0.3 Watts (8 Ohm)
Modulation Distortion	< 5% ( 1khz 60% )
SNR	35dB

## Transmitter

RF Output Power	High .5 Watt ERP, Low 0.033 Watt ERP
Range	Up to 5miles
Maximum Deviation	$\pm 2.5\text{khz}$
Modulation Distortion	< 5% ( 1khz 60% )
SNR	35 dB

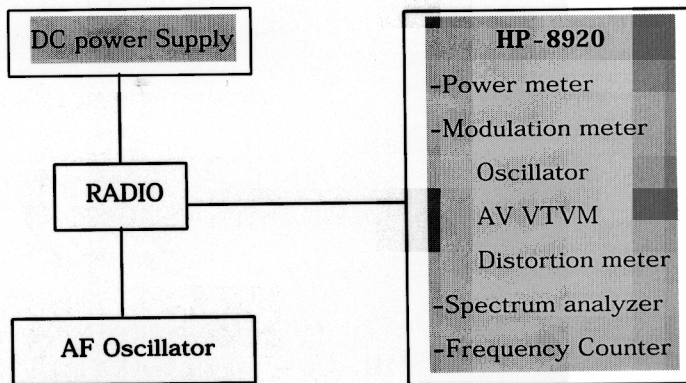
## 3. ADJUSTMENT

### 3-1. Frequency synthesizer

- After connecting the RF power meter and dummy load (50 ohm), join the antenna connector of HP8920 with above equipment.
- Check the voltage between TP and GND in digital Voltage meter.
- The set low channel(CH1, 151.820Mhz) of HP8920 the lowest frequency.
- After pressed PTT key of HP8920, check if the lowest frequency of Tx channel to DC 1.2V in the voltage of test point (VT)
- After releasing the PTT key of HP8920, check if the highest frequency (CH5,154.600Mhz) of Rx channel is within DC 1.2V in the voltage of test point (VT).

### 3-2. Transmitter

- Connect the RADIO and measure equipment according to block diagram below.



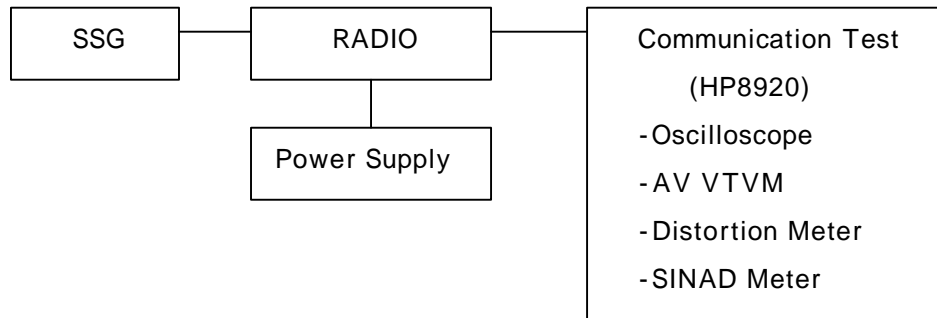
- Connect DC 6.0V voltage preset to the RADIO.
- Connect HP8920.
- Adjust Transmit frequency (CH1, 151.820Mhz) according to trimming trimmer capacitor X201.
- Connect AF Oscillator to MIC terminal for conform modulation degree.
- Set the frequency of AF Oscillator to 1khz and adjust AF level. Should be 100mV.
- Checking Oscilloscope and Modulation meter. Max deviation should be in  $\pm 2.5\text{khz}$ .

### 3-3. Transmitter Test

- Output RF power Test  
DC Power (6.0V) should be Max. ~~5 Watts~~ (ERP) and in -50% range.
- Audio Response  
Connect AF oscillator to MIC terminal and then firm the audio level that doesn't distortion the wave of Oscilloscope in the frequency range, 300hz~3,000hz. Check the audio level for 300hz~3,000hz based on frequency standard, 1khz.
- Modulation degree Test.
  - 1) Connect AF oscillator to the MIC terminal and then adjust the level to 100mV.
  - 2) Measure the Oscillator wave and the point needle of Modulation Meter after pressing PTT key.
  - 3) Sweep gradually the frequency of AF Oscilloscope from 300hz~3,000hz.
  - 4) At this time, the point needle of Modulation Meter should be in  $\pm 2.5\text{khz}$ .
- Tx Spurious Test
  - 1) Antenna is 50 $\Omega$  and attenuation degree should be 20dB more.
  - 2) Observe the Spectrum with pressing PTT key. The hamonics should be less -27 ~ -22dBm than carrier.

### 3-4. Receiver

- Preparation
  - 1) Set the power supply to DC 6.0V.
  - 2) Adjust Voltage level (AF) to 0.7Vrms(8 load) after power on.
- Connection method



- The Conform of Rx sensitivity
  - 1) Set SSG to 1channel(151.820Mhz) frequency.
  - 2) Adjust modulation frequency, 1khz to modulation degree, 1.5khz.
  - 3) After adjusting the frequency of SSG to channel frequency, RF level sets to  $-47\text{dBm}$ .
- The Conform of Squelch sensitivity
  - 1) Set the standard channel (CH1, 151.820Mhz)
  - 2) In squelch mode, SQ variable resister VR101 must be turned counterclockwise.
  - 3) After adjusting SSG to channel frequency, the RF level of SSG is set On SINAD 12~0dB.

### 3-5. Receiver Test

- Rx sensitivity test

SSG should be adjusted to 12dB of SINAD point seeing wave of Oscilloscope as SSG sets in 1khz frequency deviation.

At this time, normal RF level is  $-122\sim-124\text{dBm}$ .
- Audio Distortion Test
  - 1) SSG should be adjusted like way of point “Rx sensitivity test” and RF level sets to  $-47\text{dBm}$ .
  - 2) Adjust to 0.7Vrms (8 load) seeing Audio wave.
  - 3) Read the needle of Distortion Meter (Normal condition would be less then 5% Distortion)
- Squelch Test

After RF level of SSG should be set to the least