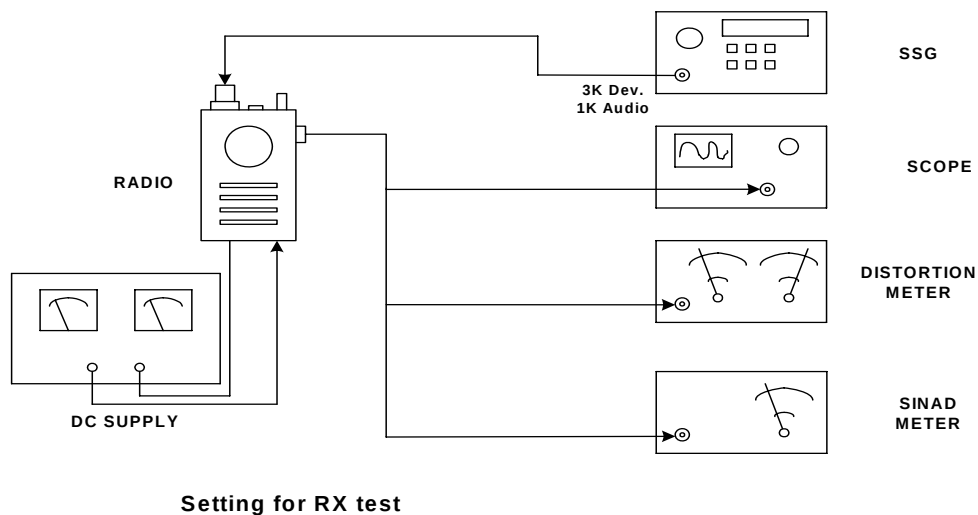
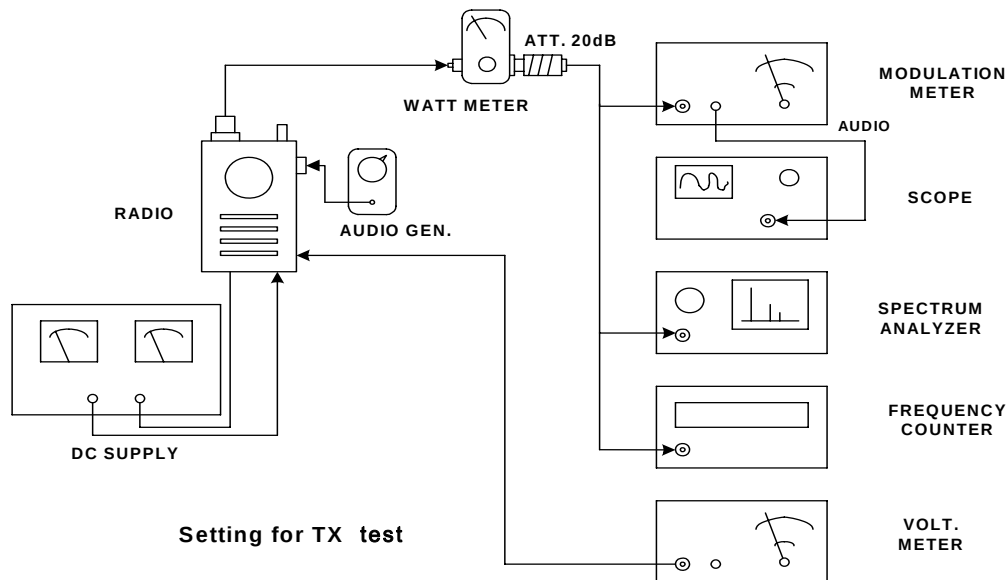


# Alignment procedure for PL2415,2215

## 1. Test equipment setting



## 2. Alignment points

### 1) PLL alignment points

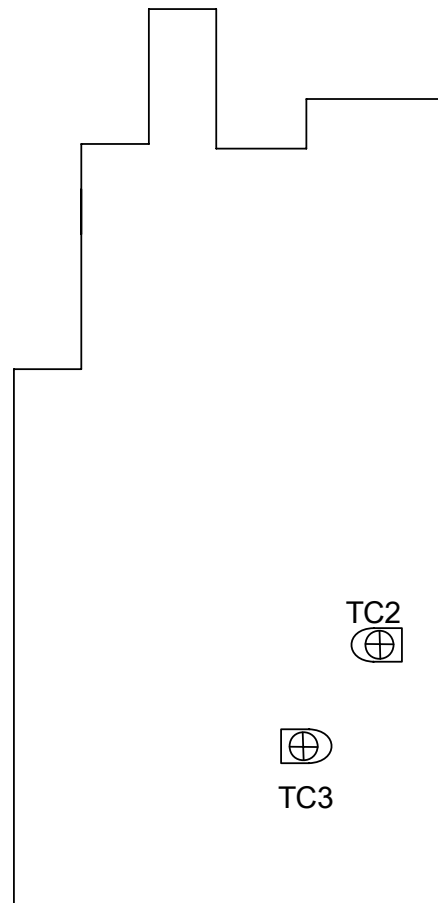
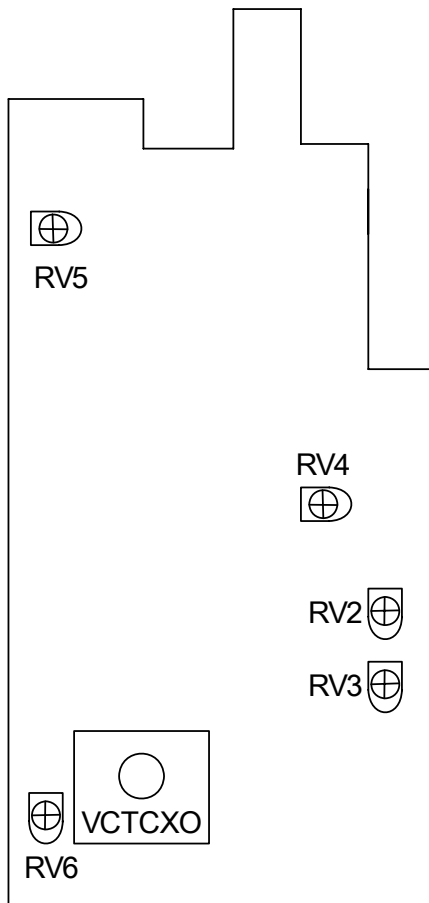
- a. R/TX Frequency : VCTCXO
- b. TX VCO Control voltage : TC2
- c. RX VCO Control voltage : TC3
- d. Balance : RV6

### 2) Tx alignment points

- a. TX power : RV5
- b. Audio Modulation : RV4

### 3) Rx alignment points

- a. Squelch : RV2(S-BAND)  
RV3(N-BAND)



### 3. Alignment procedure

#### Test mode Frequency chart

CH1 : 148.01MHZ    S BAND  
CH2 : 174MHZ        N BAND  
CH3 : 173.98MHZ    S BAND  
CH4 : 150.01MHZ    N BAND  
CH5 : 165.01MHZ    S BAND

#### 1) PLL Synthesizer (TEST MODE CH2)

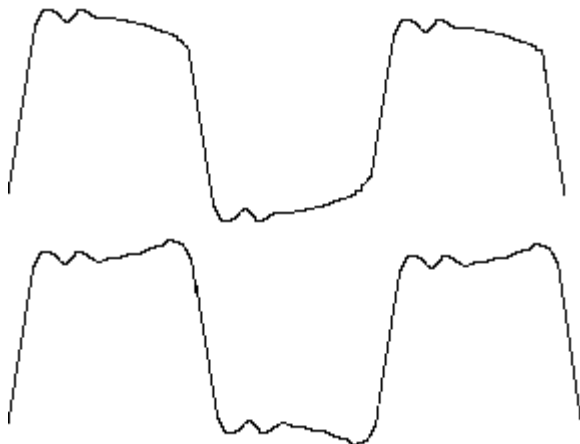
- 1) Measure the voltage of Control voltage(TP1) with High impedance voltage meter.
- 2) In RX mode(174Mhz), Adjust TC3 to tune RX control voltage at  $5.1\text{V} \pm 0.1\text{V}$ .
- 3) In TX mode(174Mhz), Adjust TC2 to tune TX control voltage at  $5.1\text{V} \pm 0.1\text{V}$ .
- 4) Adjust VCTCXO to tune frequency at 174Mhz  $\pm 50\text{Hz}$ .

#### 2) Check PLL alignment & adjust Modulation Balance (TEST MODE CH1)

- a. Check if RX control voltage at 148.01Mhz is  $1\text{V} \pm 0.5\text{V}$ .
- b. Check if TX control voltage at 148.01Mhz is  $1\text{V} \pm 0.5\text{V}$ .
- c. Set Audio Generator 0.3KHz 120mV and adjust RV6 to tune modulation balance like following picture.



Caution: If modulation balance is not tuned properly like following pictures, it causes error in TX sub-tone modulation.



### 3) TX power and TX modulation(TEST MODE CH1)

- a. Set Power supply voltage at 7.2V.
- b. Adjust RV5 to tune TX power at 1.9W+/-0.1W.
- c. Check if current in TX mode is under 1A.
- d. Set Audio Generator at 1KHz 120mV and adjust RV4 to tune TX modulation at 4.3KHz~4.4KHz.

Test equipment setting.

- IF FILTER: 30KHz 또는 230KHz
- FILTER1 : <20KHz HPF
- FILTER2 : 15KHz LPF
- De-Emphasis : off

### 4) Squelch(S band) (TEST MODE CH 3)

- a. Set SSG RF Level at -47 dBm 60% Dev @1KHz.
- b. Set audio volume output at 1V and check if RX distortion is under 5%.
- c. Check if 12dB SINAD is under -119dBm.
- d. Set the test equipment as following configuration to tune squelch.

Frequency: 173.98MHZ

Amplitude: -126dbm

AFGen1 Freq: 1khz

AFGen1 To : 3khz

- d. Set SSG amplitude at -126dbm, and tune RV2 counterclockwise until RX audio is un-muted.
- e. Tune SSG amplitude to find 9db SINAD point.
- f. Tune RV2 clockwise until RX audio is muted and tune RV2 counterclockwise until RX audio is un-muted again.

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### 5) Squelch( N band) (TEST MODE CH4)

- a. Set SSG as following configuration .

Frequency: 150.01MHZ

Amplitude: -126dbm

AFGen1 Freq: 1khz

AFGen1 To : 1.5khz.

- b. Set SSG amplitude at -126dbm, and tune RV2 counterclockwise until RX audio is un-muted.
- c. Tune SSG amplitude to find 9db SINAD point.
- d. Tune RV2 clockwise until RX audio is muted and tune RV2 counterclockwise until RX audio is un-muted again.