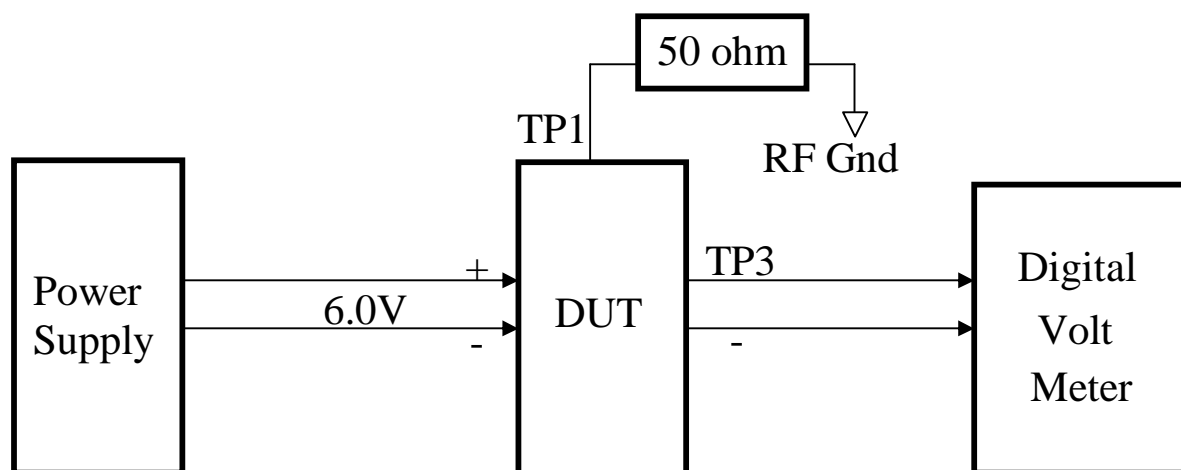


## VCO ADJUST



### Preparation :

VCO shield case has to be mounted onto the board by soldering 2 to 3 points and the DUT has to be fully cooling down before performing any alignment

### Initial Setting :

Temperature --- 25°C

Power Supply --- 6.0V +/- 0.1V

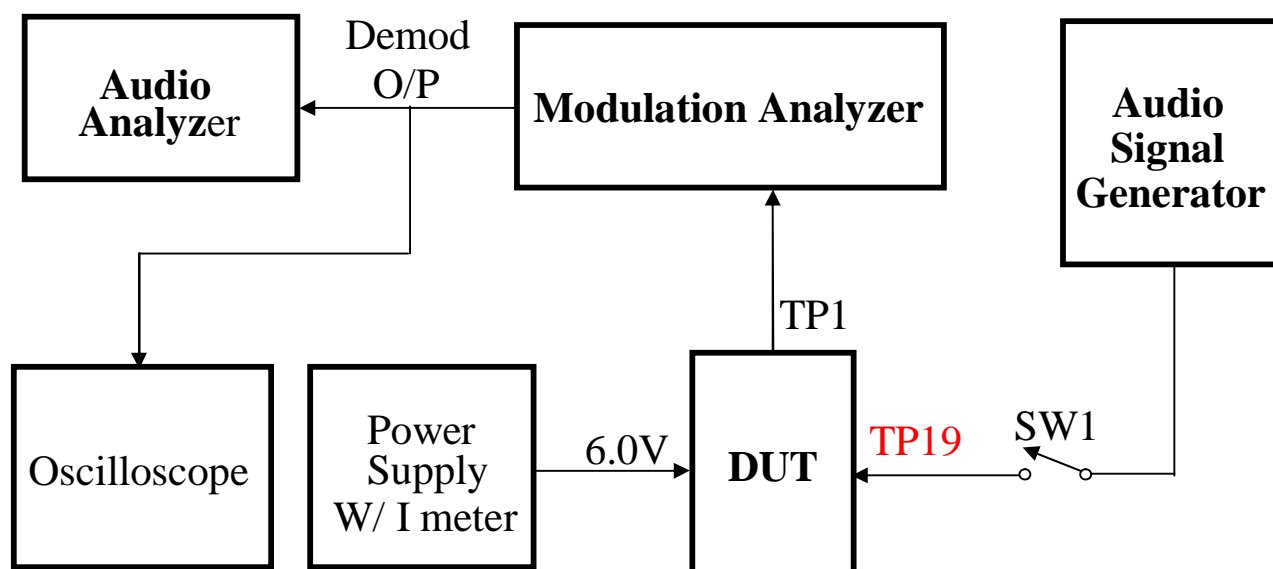
Digital Volt Meter --- Range X.XX Volt

DUT --- Set to CH1 ; CTCSS = 00

### Alignment Procedures :

- 1) Depress PTT and adjust the space of L515 to obtain Tx CH1 VCO voltage to 0.6V ~ 1.0V @ TP3
- 2) Check Rx CH1 VCO voltage on TP3 should be within 0.3V ~ 1.5V
- 3) Set DUT to CH14, check Rx CH8 VCO voltage on TP3 should be within 1.5V ~ 2.2V
- 4) Depress PTT, check Tx CH8 VCO voltage on TP3 should be within 1.5V ~ 2.2V

## Tx Alignment



### Preparation :

Fully solder the shield case onto the board and cool it down

### Initial Setting :

DUT --- Set to CH2 ; CTCSS = 00

Modulation Analyzer --- Set to frequency reading

Audio Analyzer --- Set to Distortion Mode; Filter = 50Hz / 3KHz

SW1 --- Open

AF Gen. --- 1KHz sin wave with 150mv output level

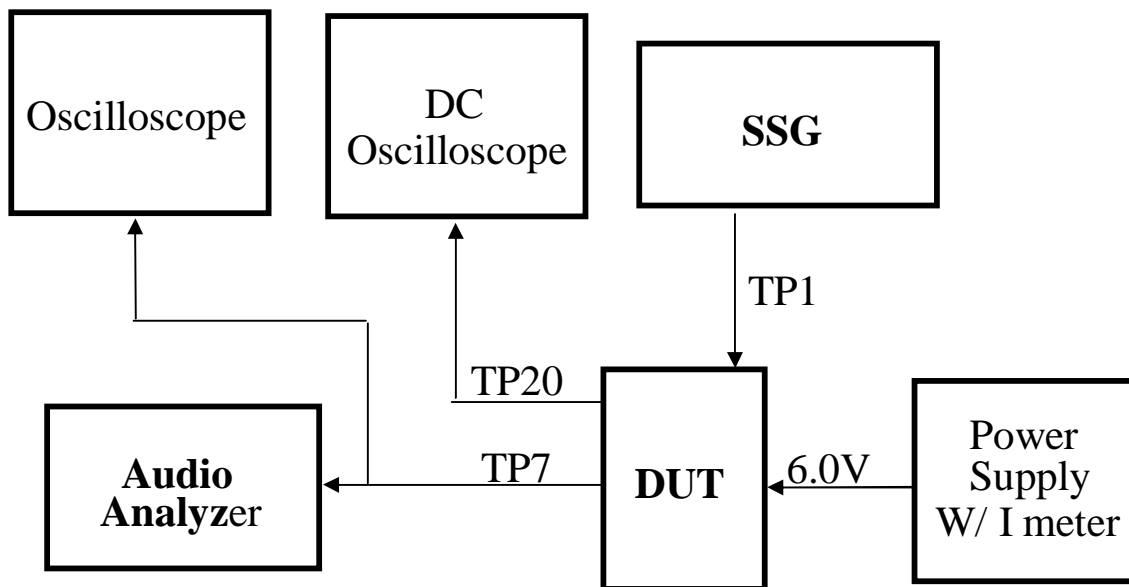
### Alignment Procedures :

- 1) Depress PTT and adjust VC501/VC501A to obtain 462587.50 KHz ; +/- 0.3KHz
- 2) Set Mod. Analyzer to Power mode, depress PTT and check Tx Power should be  $\geq 24.5\text{dBm}$  and the current should be less than 400mA
- 3) Set Mod. Analyzer to FM mode ( + - Peak /2 ); AF filter = 300Hz/15KHz, Turn SW1 to On. Depress PTT to obtain +/- 2.0 ~ 2.2KHz deviation.
- 4) Change AF Gen. O/P to 10mV, depress PTT and check Tx Dev. Should be within +/- 0.9 ~ 1.4 KHz and Distortion  $\leq 5\%$ .
- 5) Change AF Gen. to 10mV; Audio Analyzer to AC level mode, depress PTT and mark the demodulated 1KHz AC level as a reference.
- 6) Change AF Gen. to 500Hz, depress PTT and compare the demodulated 500Hz AC level with the 1KHz reference in terms of dB should be within -5.5 ~ -9.5 dB.

## **Tx Alignment --- Continue**

- 7) Change AF Gen. to 2.5KHz, depress PTT and compare the demodulated 2.5KHz AC level with the 1KHz reference in terms of dB should be within 0 ~ -4.0 dB
- 8) Depress CALL, check call deviation should be within +/- 1.1 ~ 1.5 KHz.
- 9) Set SW1 to Off, CTCSS = 01 and Mod. Analyzer filter to 50Hz/3KHz. Depress PTT and check CTCSS 01 Deviation should be within +/- 0.4 ~ 0.8 KHz.
- 10) Set CTCSS = 38. Depress PTT and check CTCSS 38 Deviation should be within +/- 0.4 ~ 0.8 KHz.
- 11) Set DUT to VOX mode, check level 1,2,3 should be turn on @ 13,9,4mv +/- 2mv respectively.

## Rx Alignment



### Initial Setting :

DUT --- Set to CH8 ; Vol Level = 5

SSG --- Freq : 467.56250 MHz ; FM modulation : +/- 1.5KHz ; Int. Mod Sig : 1KHz  
RF O/P Level : -47dBm

Audio Analyzer --- Set to AC level mode ; Filter : 300Hz/3KHz

DC Oscilloscope --- 1V DC scale

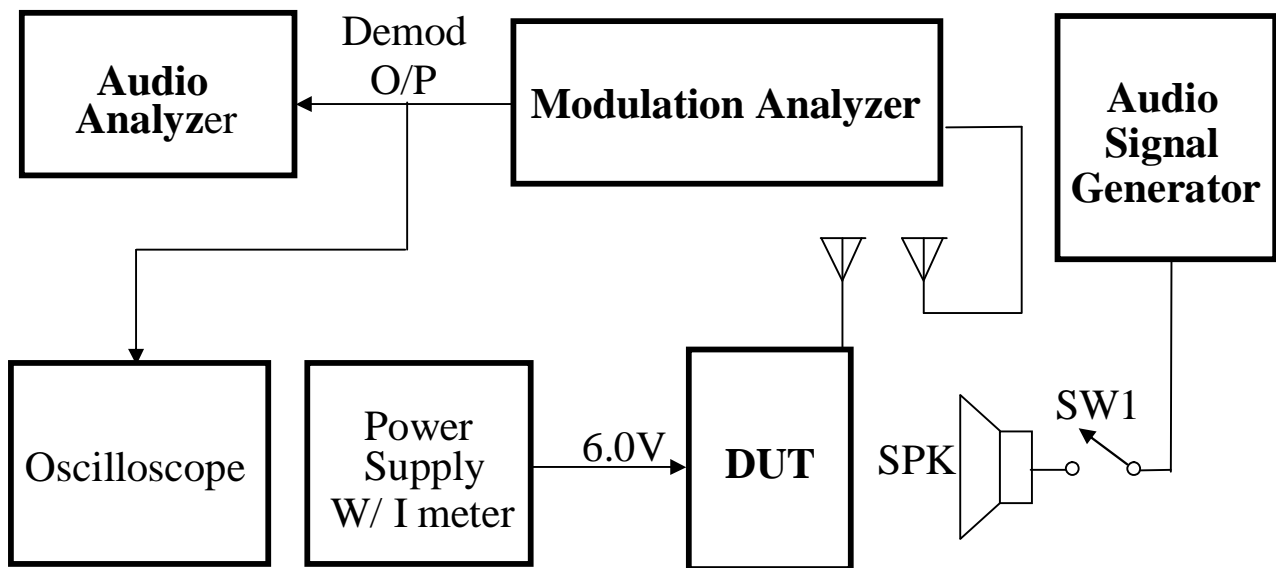
### Alignment Procedures :

- 1). Check 1 KHz AC level on the Audio Analyzer is 1V +/- 150mV. and the current consumption should  $\leq$  150mA.
- 2). Change DUT to Vol 5, SSG to Ext. Mod. Mark the 1KHz O/P level as a reference.
- 3). Change AF Gen. to 500Hz, compare the 500Hz AC level with the 1KHz reference in terms of dB should be within +2 ~ +6 dB.
- 4). Change AF Gen. to 2.5KHz, compare the 2.5KHz AC level with the 1KHz reference in terms of dB should be within -9 ~ -13 dB.
- 5). Change the Audio analyzer to Distortion mode, check Distortion should be  $\leq$  5%
- 6). Change Audio Analyzer to SINAD mode, decrease SSG O/P level until the 12dB SINAD reading is obtained. Check the SSG O/P level should be  $\leq$  -117dBm.

## **Rx Alignment --- Continue**

- 7) Decrease SSG O/P level slowly in 0.2dB step until the DC level goes just Low, then increase the level slowly again until the level becomes just Hi. Check the SSG O/P level difference between the Hi & Low points should be within 1 ~ 5 dB and the Hi level should be observed within 6 ~ 13 dB SINAD

## Tx Radiation Test



### Initial Settings :

DUT --- Set to CH5 ; CTCSS = 00

Modulation Analyzer --- Set to Frequency reading

Audio Analyzer --- Set to AC Distortion mode ; Filter 300Hz/15KHz

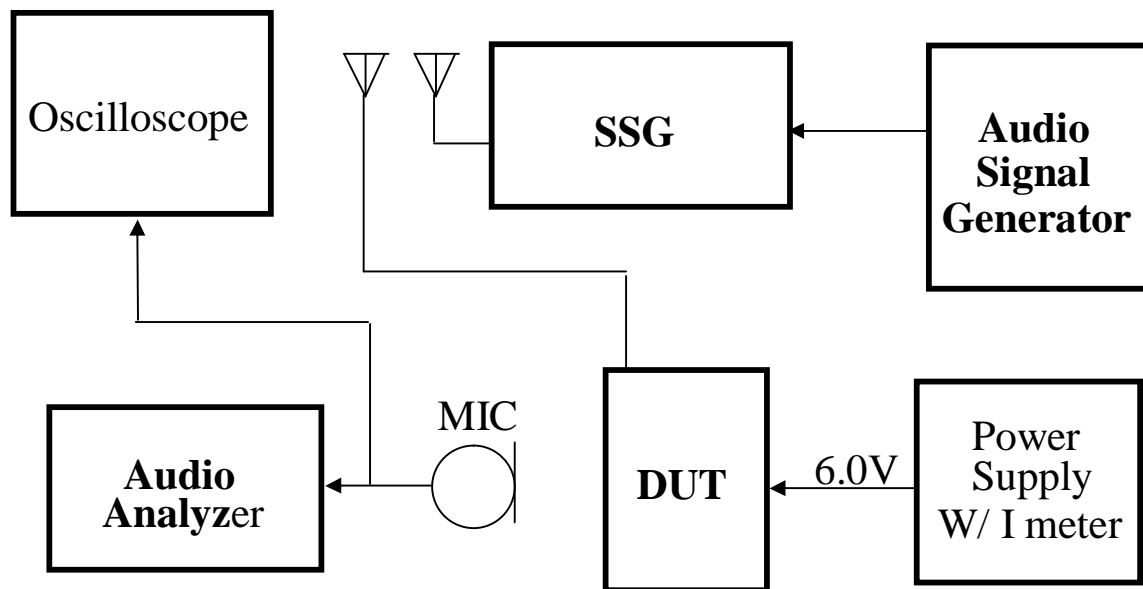
Audio Signal Generator --- 1KHz sinwave ; O/P level = 100mV ; SW1 = Off

**Test fixture:** QA test fixture or equivalent.

### Testing Procedures :

- 1) Depress PTT, check frequency should be within 462662.50KHz +/-1000Hz
- 2) Change Mod. Analyzer to Power mode, depress PTT and check Tx Power level should be >= ??? (TBD) ; current should be <= 400mA
- 3) Change Mod. Analyzer to FM mode, DUT CTCSS = 01 & 38 respectively, depress PTT and check the deviation should be within +/- 0.4 ~ 0.8 KHz
- 4) Set DUT CTCSS = 00; Sw1 = On, depress PTT and check maximum deviation should be <= 2.2 KHz
- 5) Change AF Gen. to ???mV (TBD) O/P, depress PTT and check deviation should be within +/- 0.9 ~ 1.4 KHz. & the distortion should be <= 5 %.
- 6) Depress CALL, check call deviation should be within +/- 1.1 ~ 1.5 KHz.

## Rx Radiated



### Initial Settings :

DUT --- Set to CH10 ; CTCSS = 00 ; Volume = 5

SSG --- Set freq. to 467.61250 MHz, Int. Mod. +/- 1.5KHz, Int. Mod. Sig. = 1KHz  
RF O/P level -47dBm

Audio Analyzer --- Distortion mode ; Filter 300Hz / 3KHz

AF Sig. Gen --- 1Khz sinwave ; Set O/P level to cooperate with SSG Ext.Mod. I/P

**Test fixture:** QA test fixture or equivalent.

### Testing Procedures :

- 1) Check maximum speaker O/P level should be  $\geq$  ???mV (TBD).
- 2) Change DUT to Vol 5, check distortion to be  $\leq$  5%
- 3) Change Audio Analyzer to SINAD mode, decrease RF O/P level to -???dBm (TBD),  
Check SINAD reading should be  $\geq$  12dB.
- 4) Decrease RF O/P level slowly in 0.2 dB step until the 1KHz sinwave is disappeared on the Osc. Check the SINAD should be within 6 ~ 10dB.
- 5) Increase RF O/P level slowly in 0.2 dB step until the 1KHz sinwave is appeared on the Osc. Check the SINAD should be within 6 ~ 13dB.
- 6) Check the dB difference in item 4 & 5 should be within 1 ~ 5 dB.

## Changing History

[illegible]