

LTK-1900R Transceiver TUNE UP PROCEDURE

PERFORMANCE TEST

The procedure in this chapter allows the verification of the electrical performance of Transceiver. These tests do not require access to the interior of the instrument.

Recommended test equipment

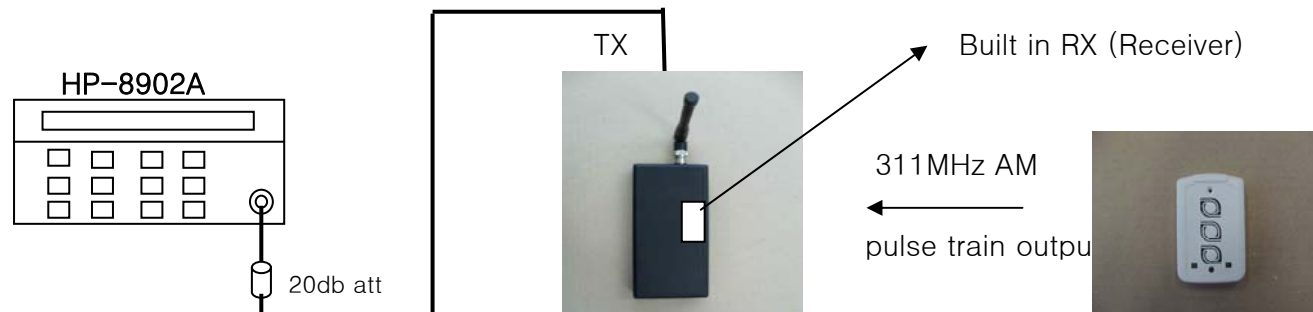
Description	Minimum specification	Model
Power meter	+ / - 0.2dB, - 60 to -20dBm. 100 KHz to 1GHz	HP-436A/8481D
Spectrum analyzer	100KHz to 12GHz, up to -120 dBm	HP-8591E
Measuring receiver	0.2 to 1300MHz, 0 to -125dBm, Freq Counter	HP-8902A
Oscilloscope	DC to 100MHz, 5mV to 1V/div, Rise Time capavility	TEK TDS360
Frequency Counter	+ / - 0.1ppm, 10Hz ~ 1GHz, 9digit	HP-53181A
Attenuator	10W, 20dB Att, DC to 1GHz	Tescom 99910

1. Frequency Accuracy

Frequency : 457.5750MHz

Stavility : Same as reference oscillator accuracy. Internal 1ppm 0 to 50degC

1.Test Setup (Connect LTK-1900R BNC Jack without antenna)





Carrier frequency accuracy test

FCC ID : QBTGTK-1900T
push button

2. HP-8902A : auto tuning, frequency display

3. LTK-1900R Transceiver

- 1) Connect 20dB Attenuators
- 2) Power On and then output power

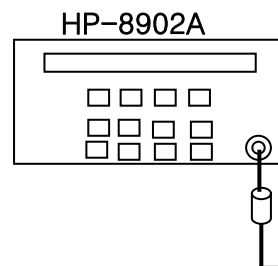
TC-1950A FREQ	Lower Limit	Actual	Upper Limit	Remarks
457.5750MHz	457.5748		457.5752	

2. RF Output Level Accuracy

RF level : 27dBm

Accuracy : +/-1dB

1. Test Setup



TX



Built in RX (Receiver)

311MHz AM
pulse train output



(Connect LTK-1900R BNC Jack without antenna)

FCC ID : QBTGTK-1900T

push button

2. HP-8902A : Auto-tuning, RF Power
3. LTK-1900R Transceiver
 - 1) Connect 20dB Attenuators
 - 2) Power On and then output power

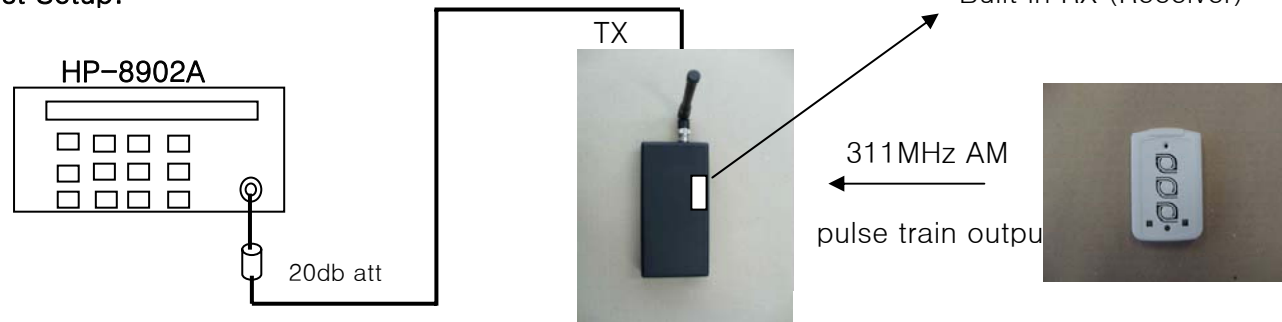
3. Spectral Purity

3.1. Residual FM Noise

RMS Noise : <10Hz Typ, 300Hz ~ 3KHz

<70Hz Typ, 50Hz ~ 3KHz

1. Test Setup.



(Connect LTK-1900R BNC Jack without antenna)

FCC ID : QBTLTK-1900T
push button

2. HP 8902A : FM, RMS, Filter BW 300Hz ~ 3KHz
3. LTK-1900R Transceiver:
 - 1) Connect 20dB Attenuators
 - 2) Power On and then output power

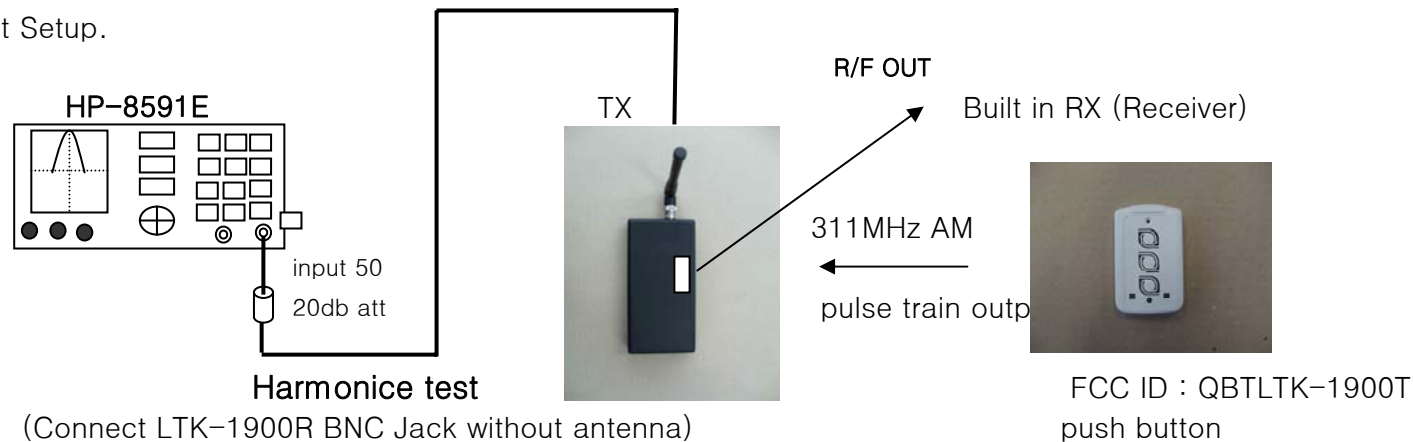
TC-1950A Signal Generator Residual FM

8902 Filter BW		Actual	Limit (Hz)	Remark
HPF	LPF			
300Hz	3KHz		10Hz	
50Hz	3KHz		70Hz	

3.2. Harmonic Spurious :

Harmonic Level at 2xFOUT : <-60dBc

1. Test Setup.



2. HP 8591E : Span = 500KHz, RBW = 10KHz, VBW = 30KHz.

3. LTK-1900R Transceiver:

- 1) Connect 20dB Attenuators
- 2) Power On and then output power

LTK-1900R Transceiver Harmonic Spurious

Fout(MHz)	Spurious(MHz)	Level(dBm)	Fout-2*Fout	Limit	Remark
457.575	915.15			-60dbc	

4. Modulation

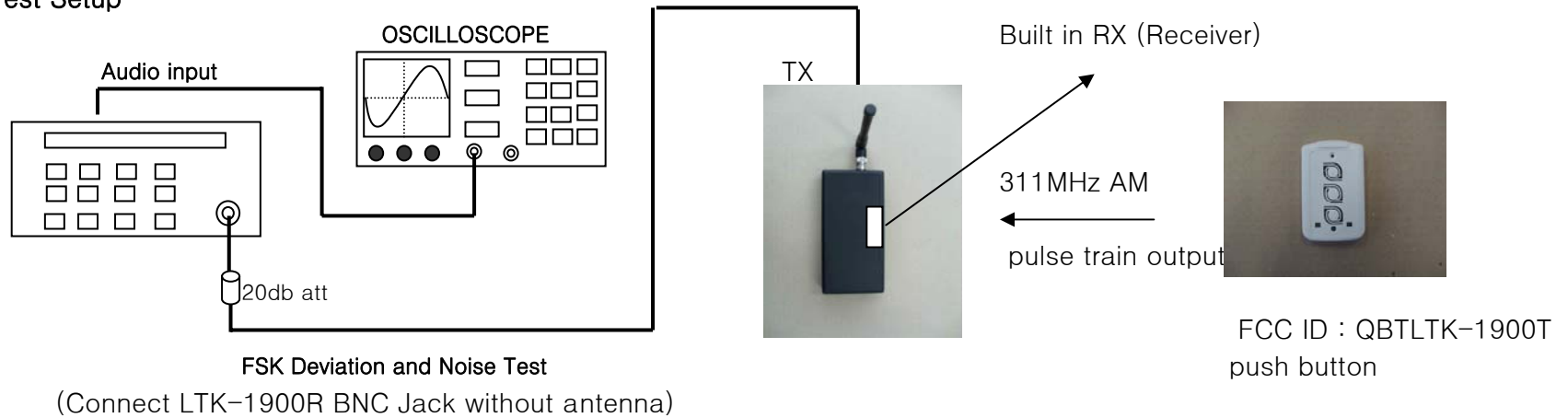
4.1. FM(RECT) (Internal FSK Test Patterns)

Deviation Accuracy

Deviation : 4.5KHz,

Accuracy : $\pm 5\%$ ($4.275 < FM < 4.725$)@4.5KHz

1.Test Setup



2.Equipment

HP-8902A : FM, AVG, HPF=OFF, LPF=15KHz

TDS360 : 250us/div, 500mV/div Average : 16

3.LTK-1900R Transceiver:

- 1) Connect 20dB Attenuators
- 2) Power On and then output power

4. Read FM Deviation in RMS.

DEV(LTK-1900R)

4.5KHz

Limit

4.5KHz + - 5%

Table : FSK Deviation Accuracy

Item	Lower	Actual	Upper	Remark
Deviation (AVG)	4.275		4.725	

* When the LTK-1900R receives signals (above two signals) simultaneously ,
The CPU of LTK-1900R saves signals in order of precedence. And then
sends signals in order of precedence.