Report of Measurements

250 Watt ATSC

Digital UHF TV Transmitter

Model AT71-250

Report of Measurements

AT71-250 DTV - ATSC UHF TRANSMITTER

Feb – 2013

Introduction

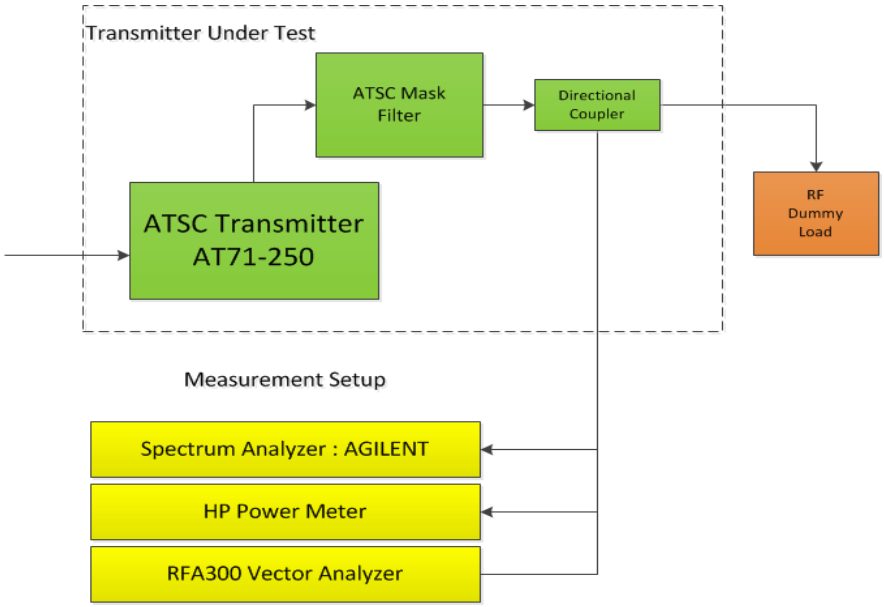
The following information intends to demonstrate the AT75K0 UHF DTV-ATSC transmitter meets the appropriate requirements applicable portions of Part 74, as summarized on the 6 items listed below:

1. Equipment Setup
2. RF Power Ouput Measurements.
3. Frequency Stability.
    a. Versus Temperature
    b. Versus Input Voltage
4. Out of Channel Characterization:
    a. Adjacent Channels
        i. Shoulders
    b. Conducted Harmonic and Spurious Measurements

5. In Channel Signal Characterization.
    a. EVM
    b. SNR (MER)

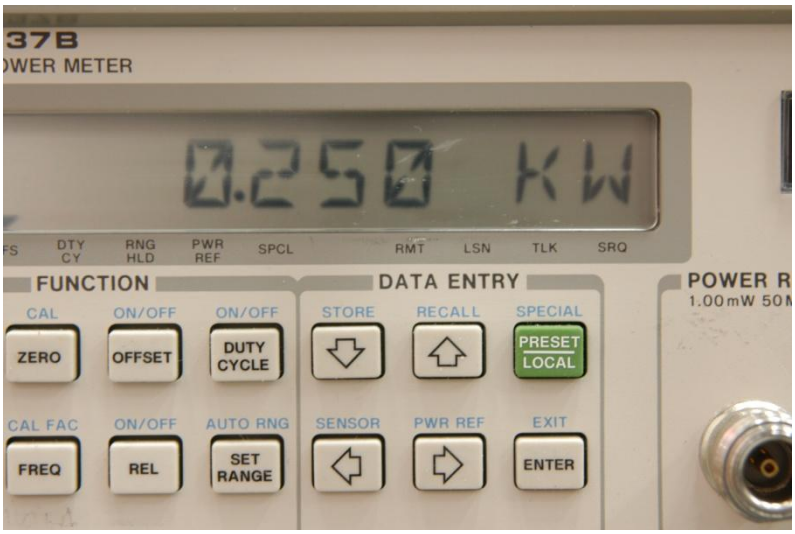
All instruments were calibrated at the time of the measurements.

1. Equipment Test Setup



2. RF Output Measurement

The loss through the RF cables and directional coupler was considered at the channel center frequency. The average power was read on the HP 473B PM Series Power Meter, and probe.



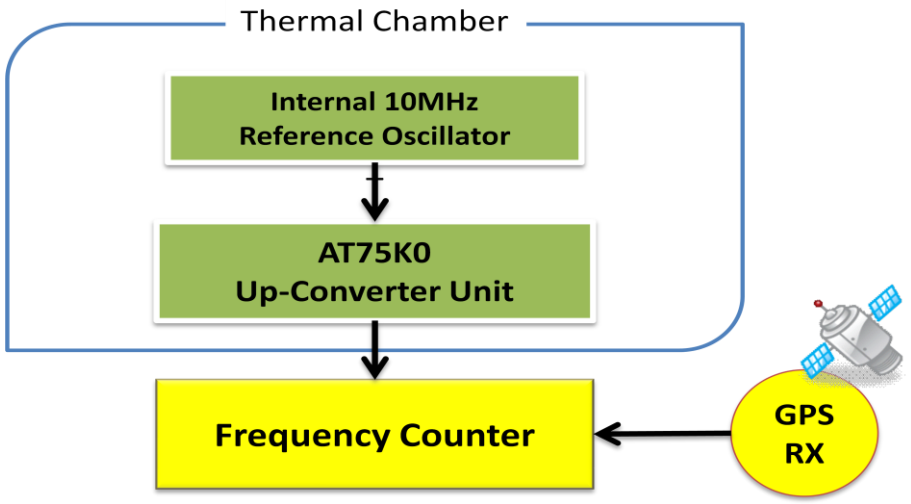
RF Output Power Measurement

1. Frequency Stability Measurements

The pilot carrier frequency is determined by a local oscillator which is synthesized by a Phase Locked Loop which is referenced by a 10MHz signal from an internal OCXO. The nominal pilot frequency for channel 21 is 512,309,441 Hz.

a. Versus Temperature

The oscillator circuitry was placed in a pre-warn +30°C temperature chamber and the temperature was raised and reduced +50°C to -30°C. The oscillator during 180 minutes was allowed to stabilize at each temperature before the measurements were recorded. Table below show the results.



Ref. CH35 Pilot Frequency: 596,309,441

Temperature [°C]	Frequency [Hz]	Offset [Hz]
0	596,309,816	+375
+10	596,309,329	-112
+20	596,309,354	-87
+30	596,309,341	-100
+40	596,309,316	-125

b. Versus Input Voltage

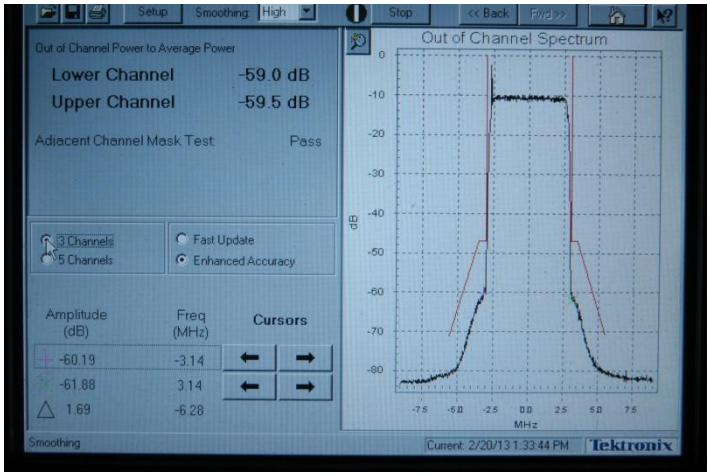
The oscillator frequency was measured as the input line voltage of the exciter drawer was varied, using a Variac transformer, from 171Vac to 245Vac. The results are shown below.

Line Voltage [Vac]	Frequency [Hz]	Offset [Hz]
171	596,309,440	-1
208	596,309,440	-1
245	596,309,440	-1

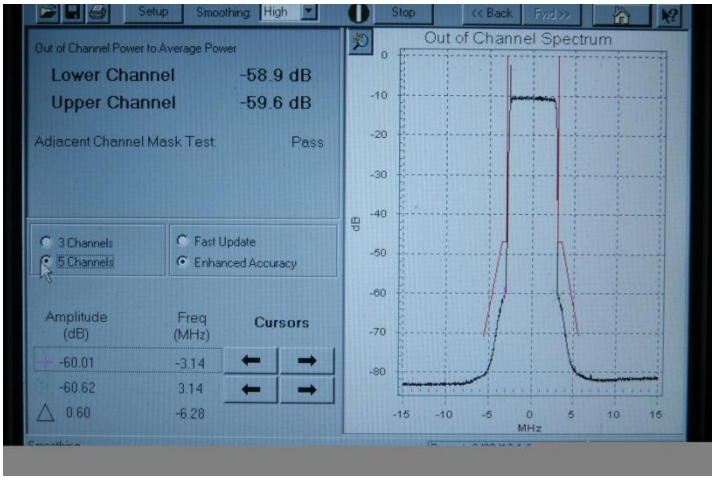
4. Out of Channel Characterization

a. Adjacent Channels

i. Shoulders

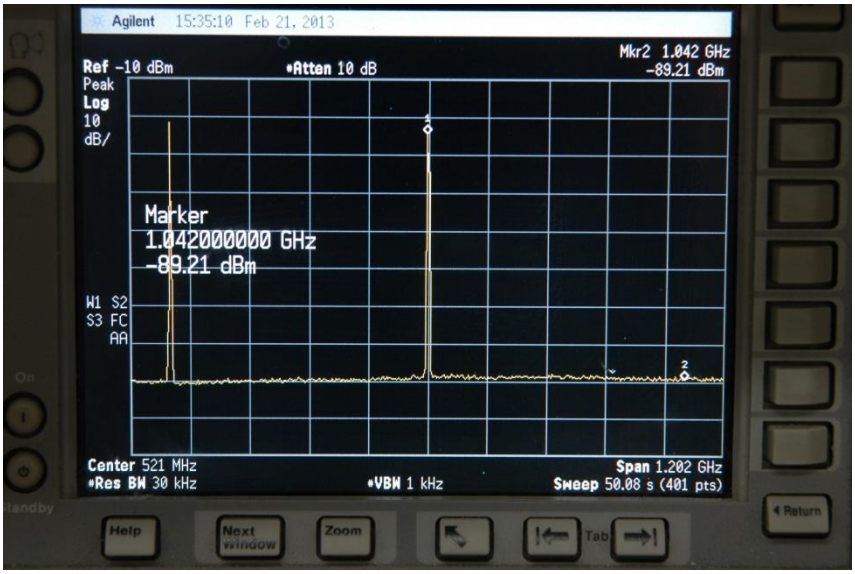


Adjacent Channels Power Spectrum – 3 CHANNELS



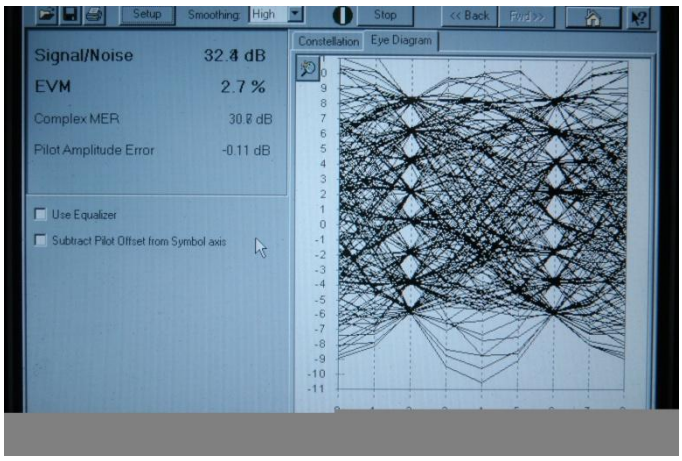
Adjacent Channels Power Spectrum – 5 CHANNELS

a. **Conducted Harmonics and Spurious Measurement**



1st Harmonic – marker #2, -89.21dB.

5. **In Channel Signal Characterization.**
   a. **EVM** = 2.7%
   b. **SNR (MER)** = 32.4 dB – [STD: > 27dB] - (ATSC Document A/64B – 5.1.2)



Test Equipment

Model	Manufacturer	Description	Serial #
E4404B	Agilent	Spectrum Analyzer	MY41441110
E4418B	Agilent	Power Meter	US38470909
RFA300A	Tektronix	Signal Analyzer	B020427
8753D	HP	Network Analyzer	3410A09613