FCC Attachment for Reducing Risk of Interference in the 700 MHz Band

1. Introduction

This document contains bandsweep measurements in the 700 MHz band conducted at 2411 Dulles Corner Park in Herndon, VA. The purpose of the measurements was to determine a channel in that band where Northrop Grumman could operate a transmitter with negligible interference to other transmitters.

2. Calibration

Figure 2.1 is the block diagram of the 700-800 MHz test set. All test equipment used was allowed a proper warm-up period prior to calibration. The test set was calibrated by the signal substitution method, as recommended by NSMA, utilizing a synthesized signal generator. The reference signal from the signal generator was adjusted for the frequency of test and measured with a thermal power meter for calibrated reference test level (-60 dBm). This calibrated reference signal from the signal generator was then injected into the end of the coaxial cable of the test set at the point, which normally connects to the test antenna. A spectrum analyzer then measured the reference test signal level after passing through the test set. Upon completion of the calibration process, a known reference level was obtained for the measurement that corresponds to a given set of spectrum analyzer display readings.

The following formula is used to transform the measured signal level as read on the spectrum analyzer display (dBm) to an isotropic reference signal level (dBm_I) as seen at the point of test:

$dBm_I = LI - GA$

Where: dBm_I = Isotropic level in dBm

LI = Level (dBm) of injected signal

GA = Test antenna gain

at 770 MHz: dBm_I = -60 dBm – 7.2 dB

= -67.2 dBm_I

In this instance, the spectrum analyzer displayed measured signal level of –104.2 dBm equates to an isotropic signal level of –111.4 dBm_I

Figures 2.2 displays the spectrum photograph of the described calibration procedure employed during these measurements.

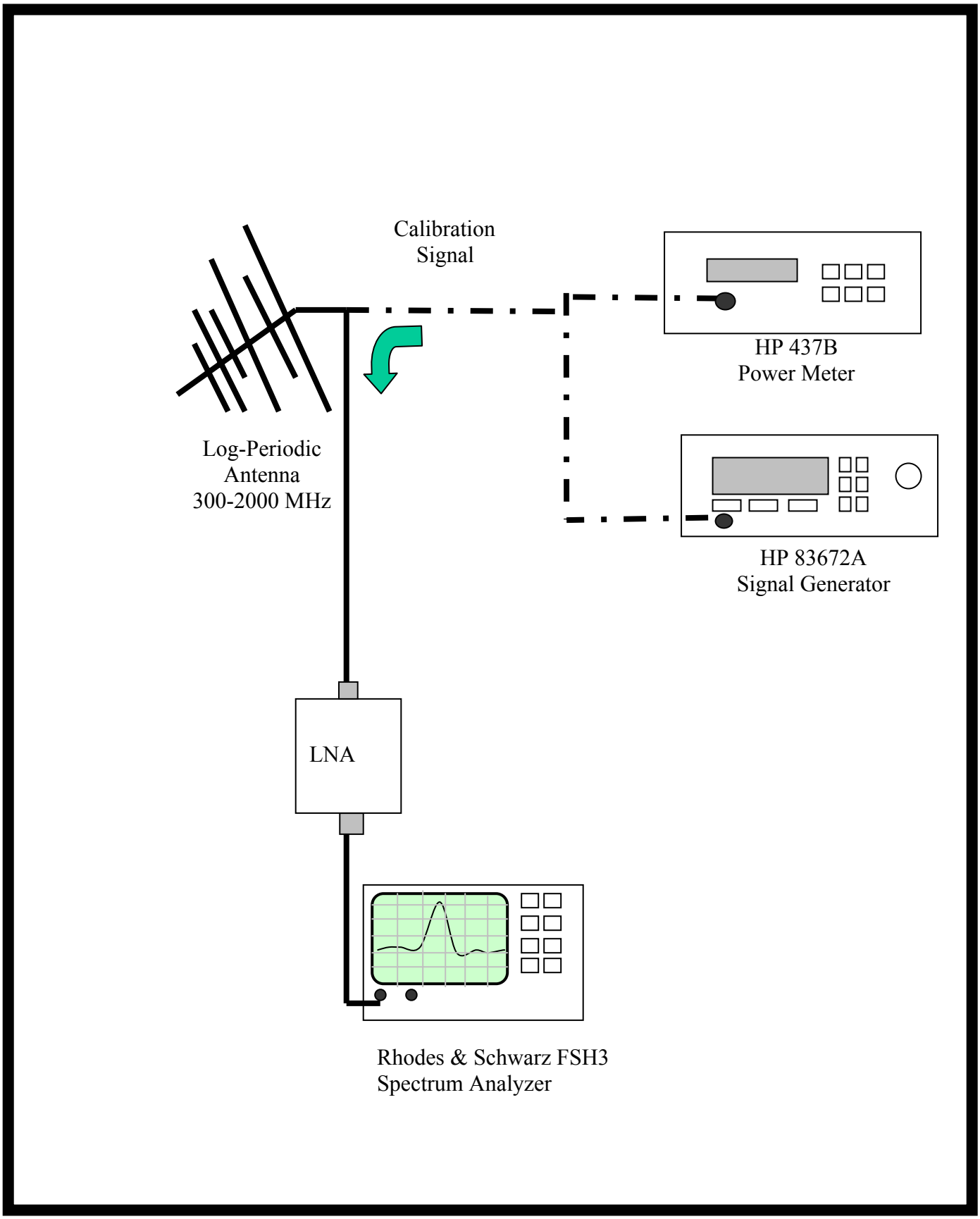

Figure 2.1 Test Equipment Block Diagram

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Reference Level dBm_I

-59.2

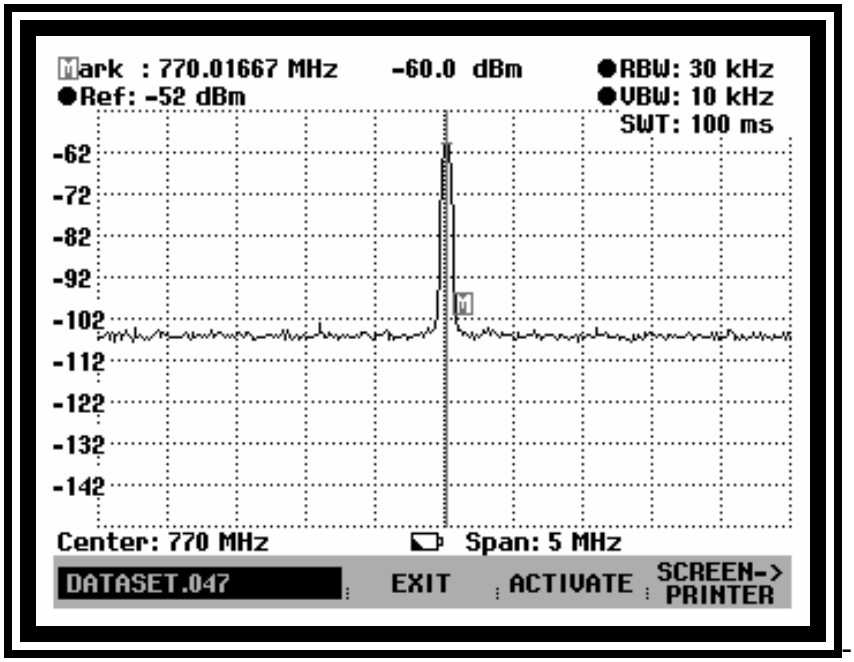


Figure 2.2 RF Calibration Photograph

3. Results

Figure 3.1 is the bandsweep conducted in the band 720 MHz to 820 MHz. Figure 3.2 are close-ups of the bands of interest.

Reference Level dBW_I

-38.0

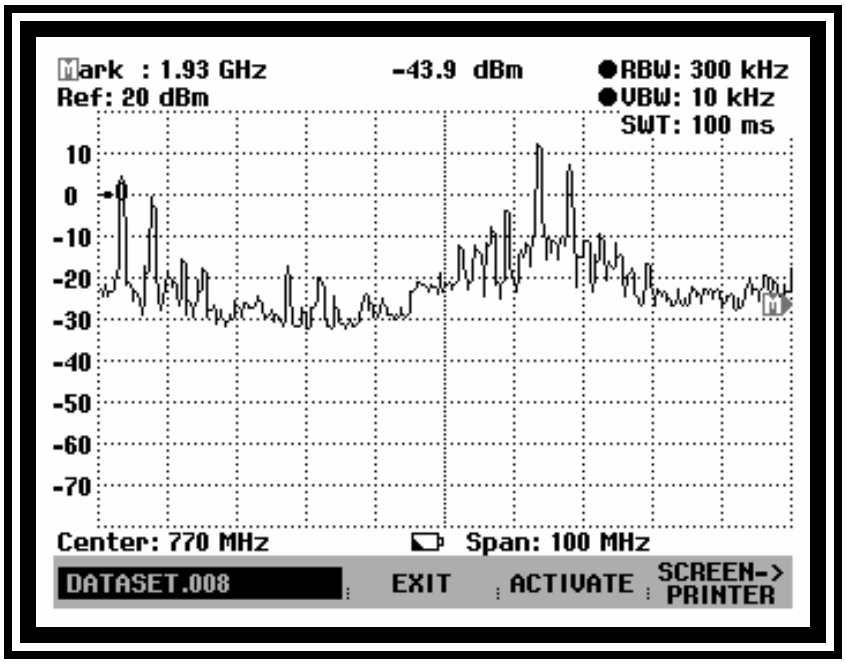
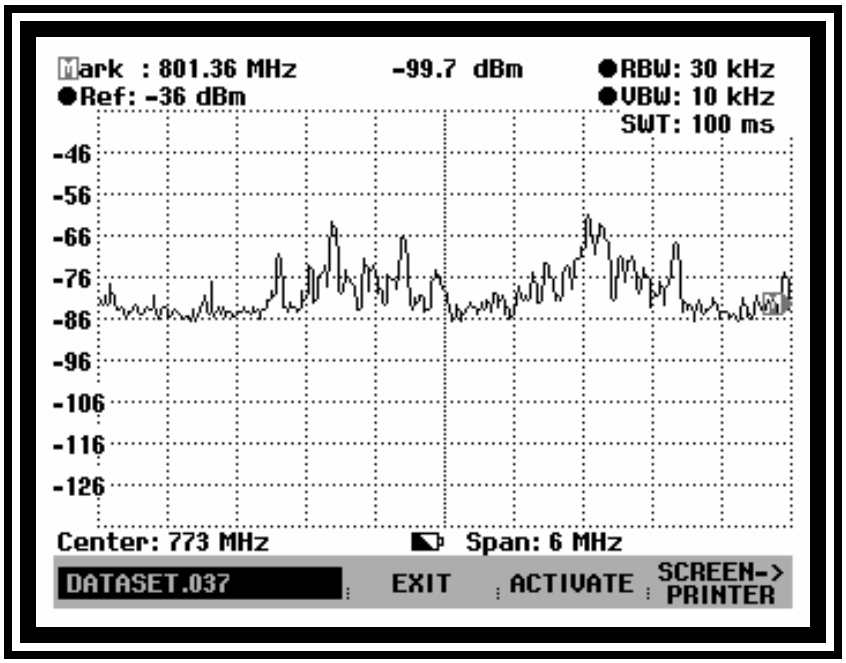


Figure 3.1: Spectrum analyzer output from Dulles Corner site for 720 MHz-820 MHz. Sweep is a combined result for 0-360^o azimuth.

Reference Level dBm_I

-43.2



Date: Oct 1, 2003

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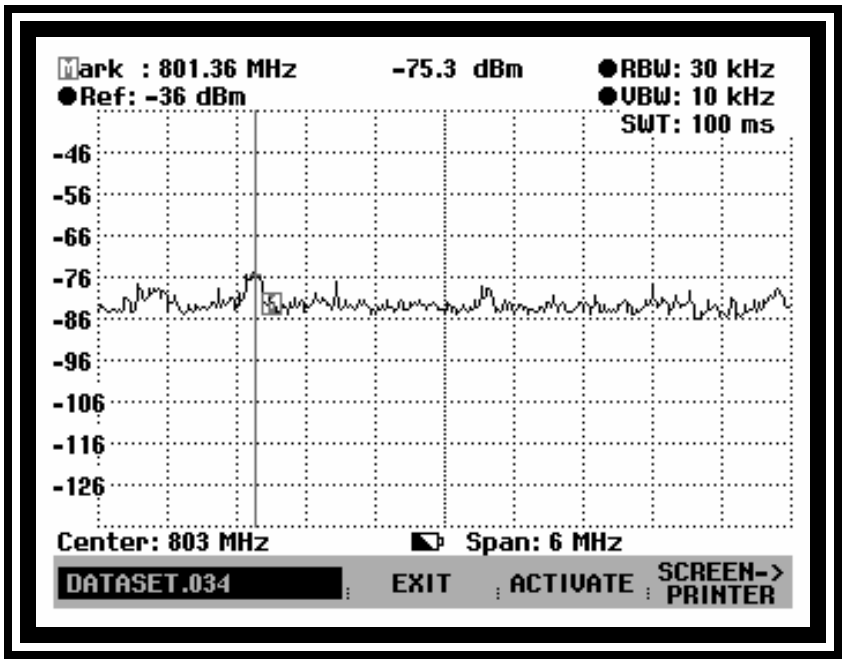
770 MHz to 776 MHz
Channel 64

Highest recorded signal:

774.26 MHz -68.2 dBmi

Reference Level dBm_I

-43.2



Date: Oct 1, 2003

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800 MHz to 806 MHz
Channel 69

Highest recorded signal:

801.36 MHz -82.5 dBmi

Figure 3.2: Spectrum analyzer output from Dulles Corner site for a) 770 MHz-776 MHz and b) 800 MHz -806 MHz. Sweeps are a combined result for 0-360^o azimuth.

4. <u>Summary</u>

The results of the previous spectrum studies show little cause for concern of interference by our proposed experimental test site in the band specified.