Fly-Over Report

Mar-Tech

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Time Warner
BATH, OH
October 12, 2005

Summary

System: **Time Warner: BATH, OH**

Test Date: **October 12, 2005**

A fly-over test for the system was performed to evaluate the system on the basis of signal leakage in the aeronautical band (108-140 MHz) as required by the F.C.C. (frequencies outside range will receive correction factor, see *Procedure* step 2a), and to determine the location and levels of any non-complying leaks (leaks in excess of 10 uV/m at 1500 feet). A description of the procedure, probability graph, a list of relative high readings, and a plotted map showing the system boundary, flight pattern and locations of relative high readings are included. Listed below are the results.

1. Generator level input into calibration antenna	**6.55** millivolts
2. Receiver adjustment to force a 10 uV/m reading	**-1** dB
3. Measure signal level of peak video carrier in aeronautical band at test point, and set generator level one dB higher.	
4. Number of sample points	**2,942** points
5. Number of points > 10 uV/m	**12** points
6. Minimum leakage	**1.32** uV/m
7. Maximum leakage	**29.24** uV/m
8. Average field intensity	**2.11** uV/m
9. Percentage of points < 10 uV/m	**99.59** %

F.C.C. requirements status: PASSED

Procedure

1. Determine system boundaries and correlate to Topo map using either a 7.5' or a 1:100,000 scale print.
2. Determine proper channel and time for testing, using a modulated carrier between 108 and 140 MHz.
   Date: **October 12, 2005**
   Time: **12:40 PM**
   Frequency: **139.2500** MHz

2a. Apply Correction factor:
   Frequencies above 140: (Data Sample) + 20 * log(f/140)
   Frequencies below 108: (Data Sample) + 20 * log(f/108)

3. **Calibration of Receiver**
   Establish signal generator input levels which will be used to calibrate AOR receiver. If calibration graph is not provided with the report, the calibration was performed at 3 feet above the ground. If calibration graph is provided with the report, the calibration was performed at 1,500 feet above ground level.

   10 uV/m field (at 3 or 1,500 feet & **139.2500** MHz)

Convert uV/m to dBmV:

dBmV = 20 * log(E) - 20 * log(20.7 * f)
(where E = 10 uV/m and f = frequency in MHz)
= 20 - 20 * log(20.7 * **139.2500**)
= **-49.1953** dBmV

dBuV = **-49.1953** + 60 (dBuV = dBmV + 60)
(we increase this amount by a factor of 20 dB to increase our sensitivity)
dB = 20 * log(x/10) where x=100 uV/m or expected reading in receiver is 100 uV/m

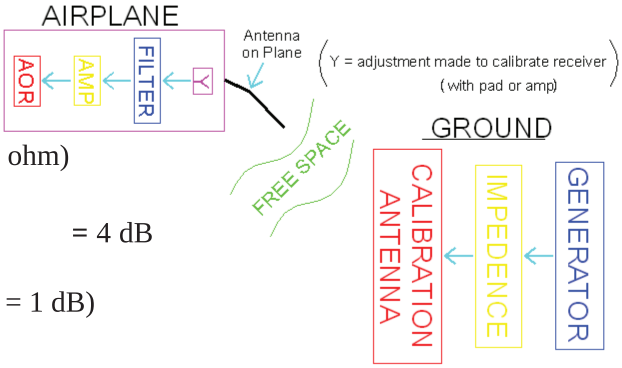
dBuV = **10.8047** + 20 dB

Determine Free Space Loss:

FSL = -37.87 + 20 * log(f) + 20 * log(d)
f = frequency in MHz and d= distance feet
= -37.87 + 20 * log(**139.2500**) + 9.54
= **14.5459** dB

Determine Signal Level Input:

100 uV/m = (free space and cable loss)
– (dipole and reflector gain)
– (impedence mismatch: 50 ohm to 75 ohm)
+ (22 dB gain amp + input)



Cable and Filter Loss (from antenna to receiver) = 4 dB

Dipole gain = 0 dB at **139.2500** MHz
(reflector gain = 2 dB; impedence gain = 1 dB)

Free space loss = **14.5459** dB
dBuV = 22 dB - 4 dB - **14.5459** + 3 dB + X (where X = generator input)
30.8047 = (21 - **14.5459**) + X
X = **30.8047** - (21 - **14.5459**)
X = **24.3506** - 108.75 (the signal generator level to create an 100 uV/m leak at receiver)
X = **-84.3994** dBm (dBm = dBuV - 108.75)

Convert to millivolts:

mV = 10 (dBuV/20)
= **32.9252** uV

Procedure

4. Test signal level input of generator with signal level meter to insure accuracy.

5. **If using video carrier:**
   Flyover performed using channel **D** video carrier.

   If using modulated carrier:
   Insert generator to combining network at **139.2500** MHz.
   Measure signal level of channel **D** video carrier at headend trunk output test point with signal level meter.
   Set generator output one dB above measured channel **D** video carrier level.

6. Perform system fly-over at 1500 feet in a grid pattern (all plant covered within 1/2 mile of pattern) at 120mph, combining GPS and signal level readings simultaneously with our software into an on-board computer (see *Test Configuration*).

7. Using system boundary polygon, filter all data points outside of system using custom software.

8. Develop a frequency distribution graph (see Probability Graph) and a listing of all relative high readings.

9. Plot all leak levels on digitized map showing the exact locations of all relative high readings along with the flight pattern .

10. An Enhanced test is a test performed with a test level inserted 2 dB or higher than adjacent video carrier levels. To generate the FCC standard report, all test data is reduced utilizing the following formula:
    $dB = 20 * \log(x / 10)$.

Probability Graph

Probability Graph not available. Please contact Mar-Tech with the following missing file name: c:\websites\140588kk6\data\cli_info\\October-2005\ADELPHIA\BATHPROB.pdf

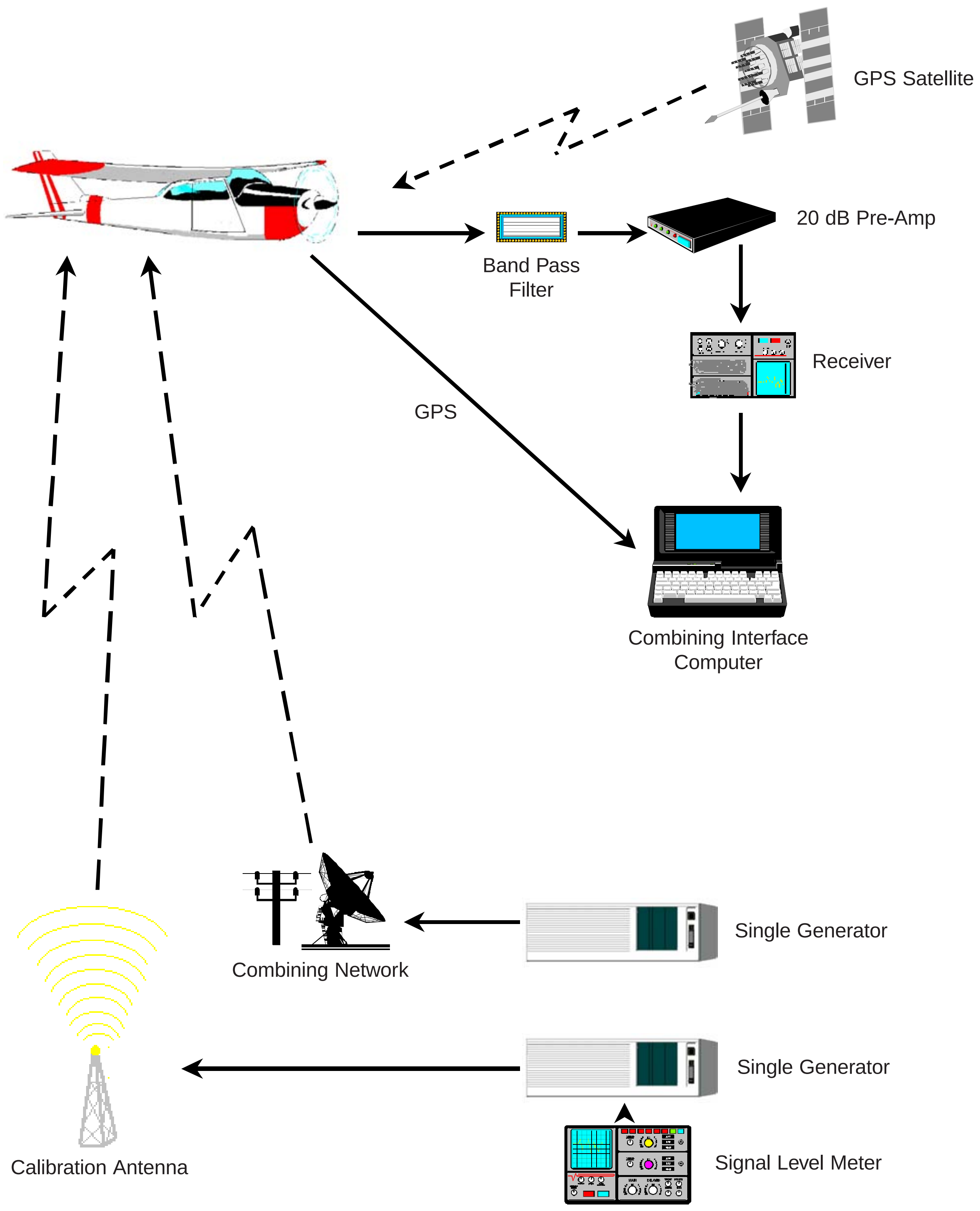
Relative High Readings

Relative High Readings data not available. Please contact Mar-Tech with the following missing file name: c:\websites\140588kk6\data\cli_info\\October-2005\ADELPHIA\BATH.hpt

List of Equipment (Partial)

Equipment	Calibration
Aircraft Partenavia P69B Cessna 210 Cessna T210 Beechcraft B76	 N/A N/A N/A N/A
Apollo 2001 GPS NMS	N/A
Leakage Detection Meters Wavetek CLM - 1000 AOR AR - 1	 Yearly Yearly
Signal Level Meters Wavetek SAM - 1550 Wavetek SAM - 2000	 Yearly Yearly
Frequency Synthesized Generators HP 8467 - A Wavetek - Model 2407 Wavetek - Model 3000-200	 Yearly Yearly Yearly
Interfacing Combining Equipment Band Pass Filter 20 dB Pre-Amp 28-13 DC Voltage Converter	 N/A N/A N/A
Lindsay Airborne Dipole Antenna	N/A
Lindsay Calibration Dipole Antenna	N/A
Laptop Computers	N/A
Mar-Tech Custom Software For Collecting And Interpreting Data And Filtering Points Outside The Polygon (System Boundary)	N/A

Test Configuration



Map

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