Fly-Over Report

Time Warner
CLEVELAND HEIGHTS(Old), 2007
September 11, 2007

Mar-Tech

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Summary

System: **Time Warner: CLEVELAND HEIGHTS(Old), OH**

Test Date: **September 11, 2007**

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	**0** 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	**637** points
5. Number of points > 10 uV/m	**0** points
6. Minimum leakage	**0.98** uV/m
7. Maximum leakage	**9.38** uV/m
8. Average field intensity	**3.77** uV/m
9. Percentage of points < 10 uV/m	**100** %

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: **September 11, 2007**
Time: **12:05 AM**
Frequency: **133.2625** 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 & **133.2625** 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 * **133.2625**)
= **-48.8136** dBmV

dBuV = **-48.8136** + 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

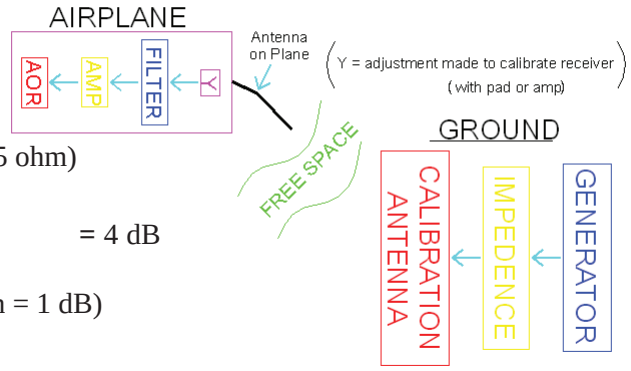
dBuV = **11.1864** + 20 dB

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(**133.2625**) + 9.54
= **14.1642** 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 **133.2625** MHz
(reflector gain = 2 dB; impedence gain = 1 dB)

Free space loss = **14.1642** dB
dBuV = 22 dB - 4 dB - **14.1642** + 3 dB + X (where X = generator input)
31.1864 = (21 - **14.1642**) + X
X = **31.1864** - (21 - **14.1642**)
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)
= **32.9253** 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 **C** video carrier.

   If using modulated carrier:
   Insert generator to combining network at **133.2625** MHz.
   Measure signal level of channel **C** video carrier at headend trunk output test point with signal level meter.
   Set generator output one dB above measured channel **C** 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\\September-2007\TIME\CLEVOPRO.pdf

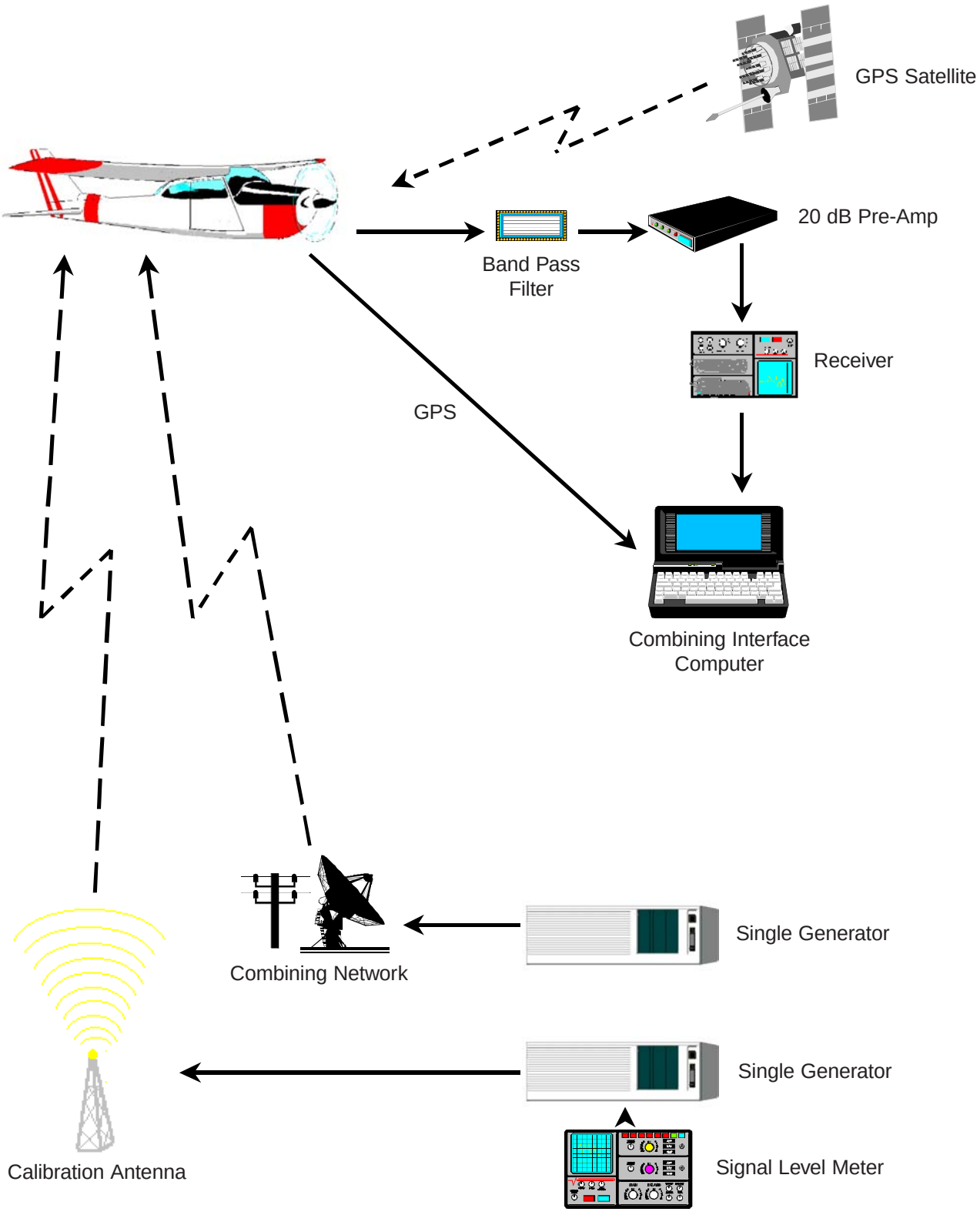
Relative High Readings

Relative High Readings data not available. Please contact Mar-Tech with the following missing file name: c:\websites\140588kk6\data\cli_info\\September-2007\TIME\CLEVO.hpt

List of Equipment (Partial)

Equipment	Calibration
Aircraft	
Partenavia P69B	N/A
Cessna 210	N/A
Cessna T210	N/A
Beechcraft B76	N/A
Apollo 2001 GPS NMS	N/A
Leakage Detection Meters	
Wavetek CLM - 1000	Yearly
AOR AR - 1	Yearly
Signal Level Meters	
Wavetek SAM - 1550	Yearly
Wavetek SAM - 2000	Yearly
Frequency Synthesized Generators	
HP 8467 - A	Yearly
Wavetek - Model 2407	Yearly
Wavetek - Model 3000-200	Yearly
Interfacing Combining Equipment	
Band Pass Filter	N/A
20 dB Pre-Amp	N/A
28-13 DC Voltage Converter	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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