



Exhibit: Supplemental Information  
Purpose: Antenna Registration Question 4: Directional Antenna Information

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**1. Purpose**

This exhibit provides supplemental Information in support of the application for Special Temporary Authorization (STA).

**2. Applicable HIRF Directives**

This special Temporary Authorization is required to conduct testing necessary to support aircraft certification for High Intensity Radiated Fields (HIRF). The test data will be used to assure compliance with HIRF requirements as specified by the following directives.

**2.1. Applicable Code of Federal Regulations (CFR)**

|               |                                                  |
|---------------|--------------------------------------------------|
| 14CFR 23.1308 | High-intensity Radiated Fields (HIRF) Protection |
|---------------|--------------------------------------------------|

**2.2. FAA Guidance**

|             |                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------|
| AC20-158    | The Certification of Electrical and Electronic Systems for Operation In<br>The High Intensity Radiated Fields (HIRF) Environment. |
| FAA 8110.71 | Guidance for the Certification of Aircraft Operating in High Intensity<br>Radiated Field (HIRF) Environments                      |

**2.3. Industry Guidance**

|                  |                                                                                              |
|------------------|----------------------------------------------------------------------------------------------|
| RTCA DO-160E/F/G | Environmental Conditions and Test Procedures for Airborne Equipment                          |
| ED90A            | Radio Frequency Susceptibility Test Procedure                                                |
| ED107            | Guide to Certification of Aircraft in a High Intensity Field (HIRF) Environment              |
| SAE ARP5583A     | Guide to Certification of Aircraft in a High Intensity Radiated Field (HIRF)<br>Environment. |

### 3. Equipment Information

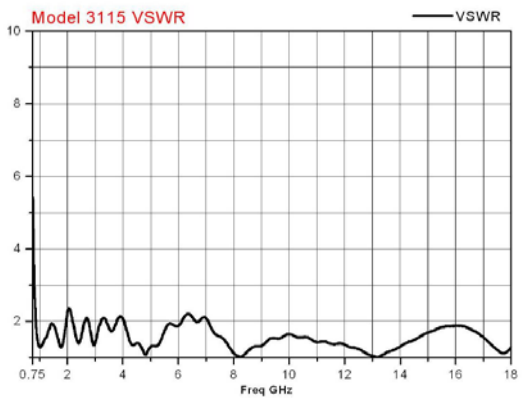
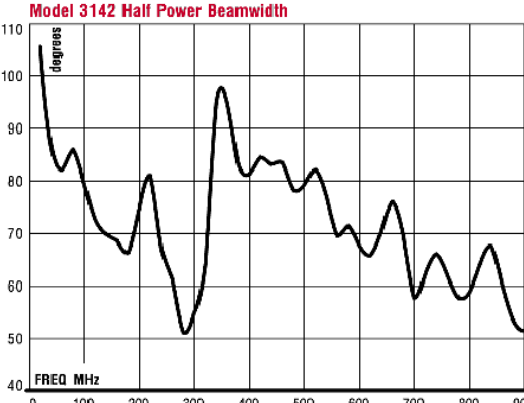
All primary field generation and monitoring equipment is listed in Table 1 below.

**Table 1: Equipment List**

| Item                        | Manufacturer       | Model (See note)              |
|-----------------------------|--------------------|-------------------------------|
| Generator                   | Agilent            | E8257D                        |
| Spectrum Analyzer           | Agilent            | E4440A                        |
| HF Amplifier                | ENI                | 5100L                         |
| Microwave Amplifier         | Miteq              | 100M-20G 30dB 20dBm Amplifier |
| Coax Cables                 | Miscellaneous      | 100MHz-18GHz Low Loss Coax    |
| Fiber Optic Receiver System | PPM                | Fiber optic processing system |
| Fiber Optic Cable           | Miscellaneous      | Fiber optic cables            |
| Directional Coupler         | Amplifier Research | DC2500                        |
| Current Probe               | Eaton              | 94111-1                       |
| Horn Antenna                | ETS Lindgren       | 3115                          |
| Dipole Antenna              | Custom             | 10MHz Dipole Antenna          |
| Bi-Log Antenna              | ETS Lindgren       | 3142C                         |
| D-dot Sensor                | EG & G             | ACD-10A                       |
| Broadband Rx Antenna        | Custom             | 100M-18GHz Rx Antenna         |

Note: Equivalent equipment may be substituted as necessary

**Table 2: Antenna VSWR and 3dB Beamwidth**

| Antenna Model | VSWR                                                                               | 3dB Beamwidth                                                                        |
|---------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 3115 Horn     |  |   |
| 3142 Bi-Log   | 2:1 Average above 80MHz                                                            |  |



#### **4. Transmitted Signal Information**

##### Frequency

The HIRF directives referenced in Section 2 of this exhibit provide guidance as to how to perform Low Level Coupling (LLC) testing. This guidance specifies the use of a signal generator and receiver system setup in a tracking generator configuration such that the test frequency is swept continuously across a specified frequency band. Testing using swept frequencies rather than widely spaced discrete frequencies allows for more accurate measurement of aircraft and wiring resonant frequencies. This method also simplifies the test setup and minimizes frequency dwell time. The effective dwell time at each swept frequency is on the order of 1ms. We request permission to perform swept frequency testing across all approved test frequency bands as listed in the application. Frequencies reserved for emergency services or local aircraft control will be omitted from the test.

##### Modulation

All testing is performed using a Continuous Wave (CW) signal (i.e. no modulation). Therefore, no actual data is being transmitted during the test.

##### Power

Transmitted power must be high enough to allow accurate monitoring using a sensitive receiver system. All transmitted power levels will remain less than the specified band specific Effective Radiated Power (ERP) as specified in the application.

The power levels requested are for maximum Effective Isotropic Radiated Power (EIRP) at the transmitter. Coordination with the local FCC and FAA can be accomplished as necessary.

#### **5. "Stop Buzzer" Contacts**

The following contacts can be contacted at any time to stop the test in case of a conflict.

Steve Haycock, Engineer  
Desk: 913-440-2284

Aaron Jones, Engineer  
Desk: 913-440-5065

David Kerr, Engineer  
Desk: 913-440-5208

Prat Patel, Engineer  
Desk: 913-440-5422

Brad Fischer, Flight Operations  
Desk: 913-440-8421