

FCC Form 442, Page 1, Item 4 Particulars of Operation

Band	Frequency Band *	Power	Power	Power	Emission	Type Signal	Necessary Bandwidth	Step Increment
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
1	50.0 Hz to 100 MHz	25 W	N/A	MEAN	NON	CW	N/A	1 KHz
2	10.0 Hz to 1.0 MHz	1000 W	0.05 W	MEAN	NON	CW	CW	1.25 KHz
3	1.0 MHz to 50 MHz	100 W	1585 W	MEAN	NON	CW	CW	62.5 KHz
4	30 MHz to 200 MHz	10 W	18 W	MEAN	NON	CW	CW	225 KHz
5	200 MHz to 500 MHz	10 W	100 W	MEAN	NON	CW	CW	375 KHz
6	500 MHz to 1000 MHz	10 W	100 W	MEAN	NON	CW	CW	625 KHz
7	962 MHz to 970 MHz	25 W	25 W	MEAN	NON	CW	CW	625 KHz
8	972 MHz to 975 MHz	25 W	25 W	MEAN	NON	CW	CW	625 KHz
9	994 MHz to 1002 MHz	25 W	25 W	MEAN	NON	CW	CW	625 KHz
10	1.0 GHz to 2.0 GHz	20 W	200 W	MEAN	NON	CW	CW	1.25 MHz
11	1040 MHz to 1050 MHz	20 W	20 W	MEAN	NON	CW	CW	1.25 MHz
12	1100 MHz to 1154 MHz	20 W	20 W	MEAN	NON	CW	CW	1.25 MHz
13	1216 MHz to 1240 MHz	20 W	20 W	MEAN	NON	CW	CW	1.25 MHz
14	1260 MHz to 1300 MHz	20 W	20 W	MEAN	NON	CW	CW	1.25 MHz
15	1337 MHz to 1345 MHz	20 W	20 W	MEAN	NON	CW	CW	1.25 MHz
16	2.0 GHz to 4.0 GHz	20 W	200 W	MEAN	NON	CW	CW	2.50 MHz
17	4.8 GHz to 8.0 GHz	20 W	200 W	MEAN	NON	CW	CW	5.00 MHz
18	5.0 GHz to 5.250 GHz	20 W	20 W	MEAN	NON	CW	CW	5.0 MHz
19	8.0 GHz to 12.4 GHz	20 W	200 W	MEAN	NON	CW	CW	5.50 MHz
20	9.0 GHz to 9.055 GHz	20 W	20 W	MEAN	NON	CW	CW	5.0 MHz
21	9.125 GHz to 9.2 GHz	20 W	20 W	MEAN	NON	CW	CW	5.0 MHz
22	12.4 GHz to 18.0 GHz	20 W	200 W	MEAN	NON	CW	CW	7.06 MHz

* Specific portions of these bands can be blanked out and not used. Coordination with local FCC/FAA can be accomplished, as necessary.

This experimental license is required to conduct testing necessary to support airframe certification for induced lightning and high intensity radiated fields (HIRF). The test data will be used to validate low frequency HIRF and lightning models and assure compliance with HIRF and lightning requirements as specified by one or more of the following:

FAA issue paper SE-2, Boeing 777, "Lightning Grounding and Protection Requirements."

JAA document JAR25X899, Boeing 777, "Electrical Grounding and Protection against Lightning and Static Electricity."

FAA issue paper SE-1, Boeing 777, "Protection from High Intensity Radiated Fields (HIRF)."

JAA HIRF Certification Review Item D-5 - Stage 2, Boeing 777, "Special Condition Protection from External High Intensity Radiated Fields."

FAA Special Condition #25-ANM-25, Boeing 747-400 and 747-400F, "Boeing 747-400 Lightning and Radio Frequency Energy Protection."

JAA Special Condition AAB747-400F/02, Boeing 747-400F, "Lightning Protection Indirect Effects."

JAA Special Condition AAB747-400F/01, Boeing 747-400F, "High Intensity Radiated Fields (HIRF)."

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The tests to be conducted in 50 Hz to 100 MHz are direct drive, swept carrier wave transfer function tests on production airplanes. These tests require driving a transmission line formed by the airplane parked over a wire grid return. Current is driven onto the aircraft by directly attaching the output of a 25 watt amplifier to the nose, wing tip, or engine nacelle. A "stepped swept" test is required to measure as many aircraft and cable resonance's as possible. Testing using widely spaced discrete frequencies would miss critical resonant frequencies. It should be noted that this will be conducted inside a large metal hangar which will provide a measure of shielding.

Tests specified under requirements 1 to 7 are to be conducted as radiated swept carrier wave open field tests. A "stepped swept" test is required to measure the maximum number of possible aircraft resonance's. Testing using widely spaced discrete frequencies would miss critical resonant frequencies..

Dwell time per frequency point. The dwell time per frequency point will be a maximum of 75 milliseconds per point based on 401 points in a 30 second maximum sweep. the maximum number of sweeps per test will be 64.

a second swept carrier wave field test will be used over the frequency range of 400 MHz to 18 GHz. All the above conditions apply, except the dwell time per frequency point will be a maximum of 5 seconds.

Time between tests: 2 minutes.

Aircraft to be tested: Variable, one per year anticipated.

Maximum number of tests per aircraft: 1000. The actual number of tests will vary as necessary to obtain data required to ensure compliance with cited requirements.

Note: Similar, FCC licensed, testing has been performed at Tucson, AZ. Glasgow, Mt. and Tulalip, WA.

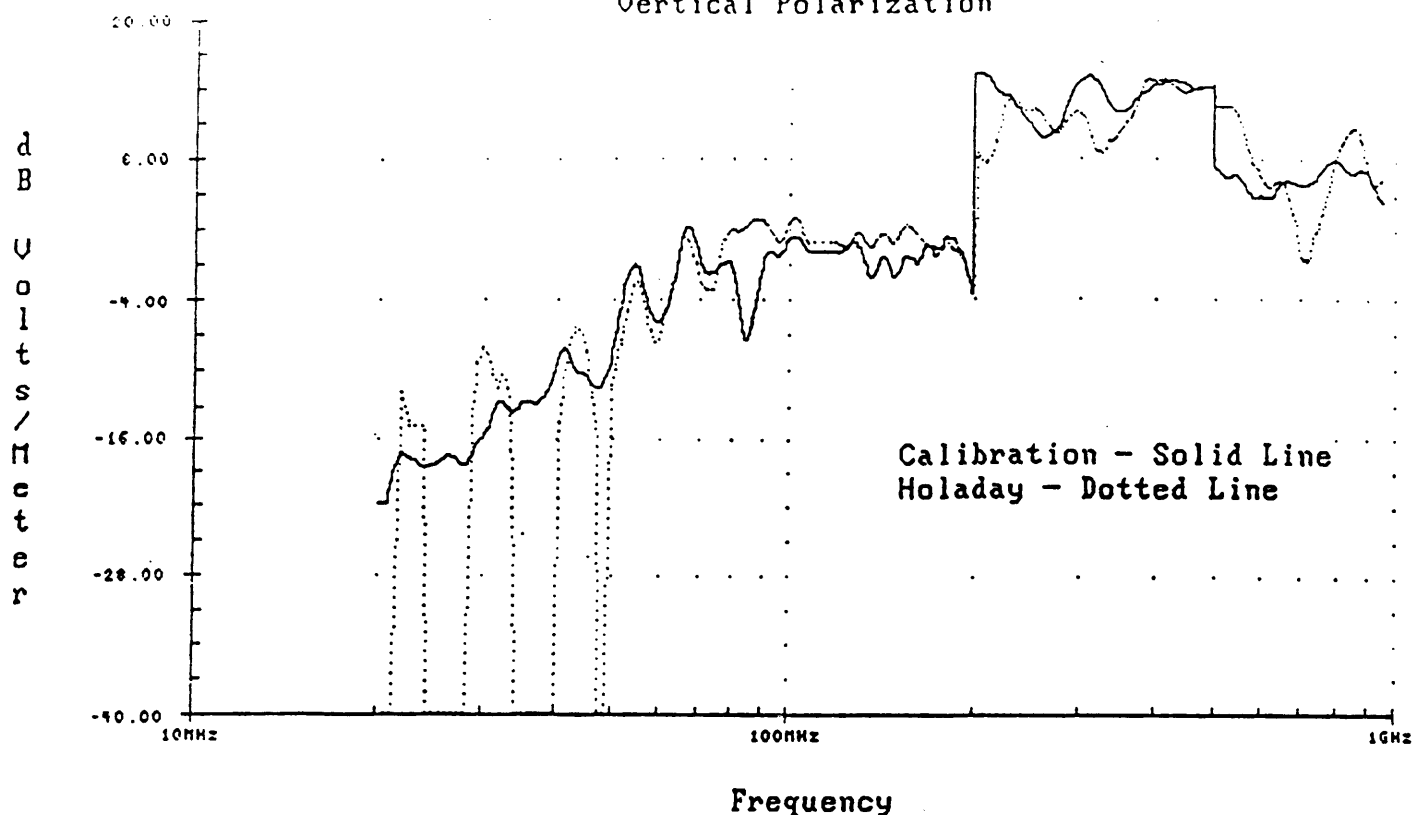
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	<u>Manufacturer</u>	<u>Frequency Band</u>	<u>Amplifier Type</u>	<u>Antenna Type</u>	<u>Units</u>
1	RF Power Labs	50 Hz - 100 MHz	M125L	(note 1)	1
2	Kalmus	50 Hz - 100 MHz	520FC	(note 1)	1
3	IFI	50 Hz - 100 MHz	M5500	(note 1)	1
4	ENI	10 KHz - 1.0 MHz	1040L	QRA*	1
5	ENI	1.0 - 50 MHz	5100L	QRA*	1
6	IFI	30 - 200 MHz	M5500	Dipole	1
7	Kalmus	30 - 200 MHz	520FC	Dipole	1
8	IFI	200 - 500 MHz	M5500	Horn	1
9	Kalmus	200 - 500 MHz	520FC	Horn	1
10	IFI	500 - 1000 MHz	M5500	Horn	1
11	Kalmus	500 - 1000 MHz	720FC	Horn	1
12	Hughes	1.0 - 2.0 GHz	8020HO9R	Horn	1
13	Hughes	2.0 - 4.0 GHz	8020HO9R	Horn	1
14	Hughes	4.0 - 8.0 GHz	8020HO9R	Horn	1
15	Hughes	8.0 - 12.4 GHz	8020HO9R	Horn	1
16	Hughes	12.4 - 18.0 GHz	8020HO9R	Horn	1

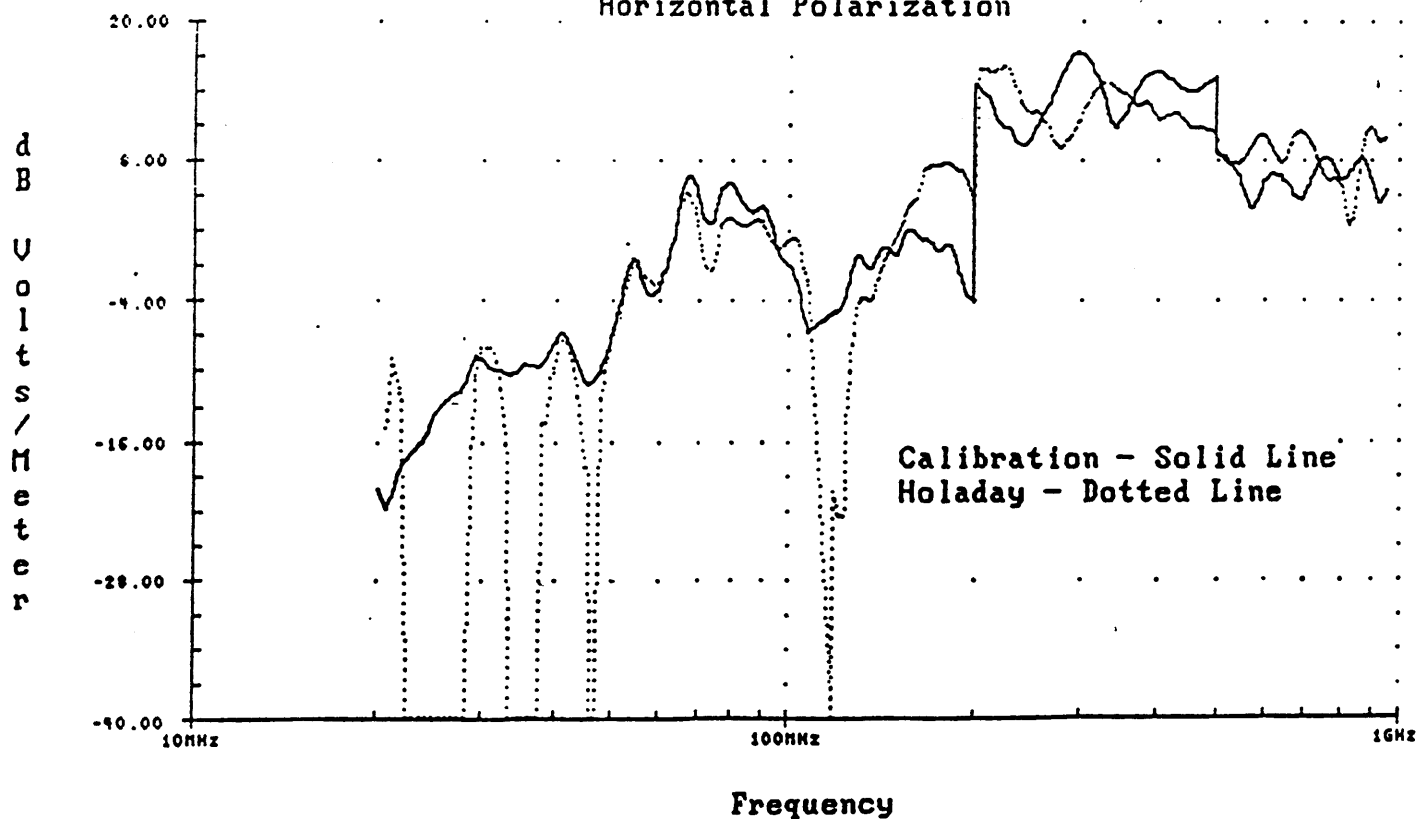
Note 1 This equipment is direct drive with no deliberate antenna.

* Quasi Rhombic Antenna (Bands 2 and 3 only)

15' Absolute Cal. Measurement vs Holaday Measurement
Vertical Polarization



15' Absolute Cal. Measurement vs Holaday Measurement
Horizontal Polarization



15' ANTENNA HEIGHT ABSOLUTE CALIBRATION MEASUREMENTS TAKEN AT TUCSON, AZ

FIELD STRENGTHS MEASURED AT 50' FROM THE TX ANTENNA
IN BANDS 20-200 MHz, 200-500 MHz, AND 500 MHz-1 GHz