

GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station

PROJECT INITIATION

Date: 3/12/71

Project Title: **RF Reflectivity Measurements**
Project No.: **A-1299**
Project Director: **Mr. Harold L. Bassett**
Sponsor: **Goodyear Aerospace Corporation**
Effective **December 24, 1970** Estimated to run until: **April 24, 1971**
Type Agreement: **Purchase Order No. 0L2793 YX** Amount: \$ **3,399 (fixed-price)**

Reports: **Final Report due April 24, 1971**
(Samples to be returned also)

Contact Person: **Mr. C. Hardenstein/121**
Goodyear Aerospace Corporation
Akron, Ohio 44315

Assigned to . . . **Electronics (Special Techniques)** Division

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GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station

PROJECT TERMINATION

Date 10/11/71

PROJECT TITLE: RF Reflectivity Measurements
PROJECT NO: A-1299
PROJECT DIRECTOR: Mr. Harold L. Dassetz
SPONSOR: Goodyear Aerospace Corporation; Akron, Ohio
TERMINATION EFFECTIVE: 10/4/71 (Final Report submitted)
CHARGES SHOULD CLEAR ACCOUNTING BY: 10/31/71

Contract Closeout Items Remaining:

Final Invoice (when all charges clear).

Electronics (Special Techniques) Division

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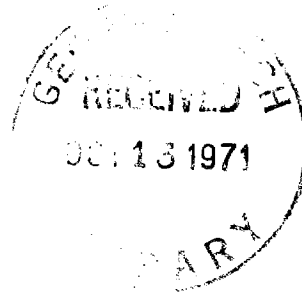


EXPERIMENT STATION

225 North Avenue, Northwest Atlanta, Georgia 30332

3 May 1971

Mr. R. E. Whitacre
Goodyear Aerospace Corporation
Wingfoot Lake Division
841 Wingfoot Road
Mogadore, Ohio 44260



Dear Mr. Whitacre:

The following data tabulation is a summary of the measurements performed on the stated materials.

Material	Frequency (GHz)	Polarization	Incidence		% Reflectivity	
			Angle (degrees)		1	4
RF1-1	60.0	V	0		96.5	97
			30		95.5	94.4
		H	0		96	98
			30		96	99
RF2-1	60.0	V	0		96	93
			30		94.8	95.5
		H	0		97.1	98.8
			30		96	98.8
RF3-5	60.0	V	0		98	99
			30		--	--
		H	0		98	99
			30		97.5	98
RF17-10	60.0	V	0		98	98
			30		92	93
		H	0		97.7	98.8
			30		95	97
RF1-1	94.0	V	0		98	97.6
			30		98.0	96
		H	0		99	97.8
			30		99	98.6
RF2-1	94.0	V	0		99	98.6
			30		93	88
		H	0		97.4	99.6
			30		99.8	99.6

Mr. Whitacre

-2-

3 May 1971

Material	Frequency (GHz)	Polarization	Incidence Angle (degrees)	% Reflectivity	
				1	4
RF3-5	94.0	V	0	98.5	97.5
			30	98.5	96.5
		H	0	97	97
			30	--	--
RF17-10	94.0	V	0	98	98
			30	98.8	99.0
		H	0		
			30	98	98
				<u>Backside</u>	
				1	4
RF1-1	60.0	V	0	98.8	38
		H	0	47	98.8
RF1-1	94.0	V	0	99	62

For further information, please contact me.

Respectfully,

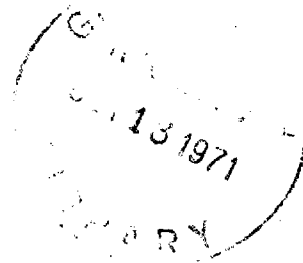
Harold L. Bassett
Project Director

HLB:mb

cc: File A-1299



30 September 1971



Mr. C. Hardenstein/MM
Goodyear Aerospace Corporation
Akron, Ohio 44315

Subject: Final Report, RF Reflectivity Measurements,
P. O. No. OL2793 YX, Georgia Tech Project A-1299.

Dear Sir:

The reflectivity of the eight Goodyear samples are tabulated in Tables 1 and 2 for 60 GHz and 94 GHz, respectively. The measurements were performed in the following manner:

A horn-lens system focused the RF signal to a spot size (3 dB points) of approximately 1 cm. A reference sample (silver-plated brass, flat sheet) was placed at the focal point and the reflected signal back into the RF system was monitored. The flat plate reference sample was replaced by a Goodyear sample, and the difference in reflected signal, if any, was noted.

Measurements were performed with the samples positioned at normal incidence to the focused beam and at 30° incidence for both horizontal and vertical polarizations.

Two samples (10-1 and 10-2) were found to be polarization sensitive as noted in the Tables. The remainder of the samples have reflection coefficients near 100% with respect to the reference sample. The positions 1 and 2 in the Tables denote "up" positions for each sample.

30 September 1971

If we can be of further assistance, please direct technical questions to Mr. Harold L. Bassett (Ext. 147) and contractual questions to Mr. Robley H. Tatum (Ext. 808).

Respectfully,

Harold L. Bassett
Project Director

Approved:

✓
J. W. Dees
Head, Special Techniques Branch

TABLE 1

(Frequency: 60 GHz)

<u>Sample No.</u>	<u>Position</u>	<u>Polarization</u>	<u>Incidence Angle</u>	<u>Reflecting (Percent)</u>
10-1	1	V	Normal	85
	2	V	Normal	99
	1	V	30°	80
	2	V	30°	100
	1	H	Normal	99
	2	H	Normal	85
	1	H	30°	100
	2	H	30°	80
10-2	1	V	Normal	87
	2	V	Normal	99
	1	V	30°	84
	2	V	30°	99
	1	H	Normal	99
	2	H	Normal	87
	1	H	30°	99
	2	H	30°	84
UV2-2	1	V,H	Normal, 30°	99
	2	V,H	Normal, 30°	99
UV2-3A	1	V,H	Normal, 30°	98
	2	V,H	Normal, 30°	99
UV2-3B	1	V,H	Normal, 30°	99
	2	V,H	Normal, 30°	99
RF3-4	1	V,H	Normal, 30°	99
	2	V,H	Normal, 30°	99
RF4-4	1	V,H	Normal, 30°	99
	2	V,H	Normal, 30°	99
RF4-5	1	V,H	Normal, 30°	99
	2	V,H	Normal, 30°	99

TABLE 2

(Frequency: 94 GHz)

<u>Sample No.</u>	<u>Position</u>	<u>Polarization</u>	<u>Incidence Angle</u>	<u>Reflectivity (Percent)</u>
10-1	1	V	Normal	74
	2	V	Normal	99
	1	V	30°	70
	2	V	30°	100
	1	H	Normal	99
	2	H	Normal	74
	1	H	30°	100
	2	H	30°	69
10-2	1	V	Normal	74
	2	V	Normal	99
	1	V	30°	74
	2	V	30°	100
	1	H	Normal	99
	2	H	Normal	74
	1	H	30°	100
	2	H	30°	68
UV2-2	1	V,H	Normal, 30°	100
	2	V,H	Normal, 30°	100
UV2-3A	1	V,H	Normal, 30°	100
	2	V,H	Normal, 30°	100
UV2-3B	1	V,H	Normal, 30°	100
	2	V,H	Normal, 30°	100
RF3-4	1	V	Normal	99
	1	H	Normal, 30°	100
	2	V,H	Normal, 30°	100
RF4-4	1	V,H	Normal, 30°	100
	2	V,H	Normal, 30°	100
RF4-5	1	V,H	Normal, 30°	100
	2	V,H	Normal, 30°	100