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Electrical Engineering Research Laboratory The University of Texas

Austin, Texas

Report No. 131

30 June 1963

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March 1961-June 1963

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**ELECTRICAL ENGINEERING RESEARCH LABORATORY
THE UNIVERSITY OF TEXAS
Austin, Texas**

Report No. 131

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I. INTRODUCTION

Electrical Engineering Research Laboratory Reports Nos. 106 and 121 presented consolidated listings of the publications of this Laboratory as of the end of February 1961. A supplemental listing was made up and distributed which covered the period from March 1, 1961 through January 1962.

This report will supplement 106 and include the listings in the supplemental report. No effort will be made to list informal reports such as memoranda and quarterly status reports except where significant technical information is involved.

II. SPONSORING AGENCIES AND CONTRACTS

Since the basic listing has been given in the two previous reports only those which have been in effect at some time during the period March 1961 up to the present time will be listed here.

U. S. Navy - Office of Naval Research

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U. S. Air Force

1. Aeronautical Systems Division, Wright-Patterson Air Force Base, Ohio

AF 33(616)-6257

AF 33(657)-7333

AF 33(657)-8716

2. Air Force Cambridge Research Laboratories

a. Geophysics Research Directorate

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AF 19(604)-7279

b. Electronics Research Directorate

AF 19(604)-8038

AF 19(604)-8036

AF 19(604)-8513

U. S. Army

1. White Sands Missile Range

DA-23-072-ORD-1564

2. Signal Research and Development Laboratories

DA-36-039-SC-84937

DA-36-039 SC-89179

3. Electronics Research and Development Activity

DA-SIG-36-039-61-G11

III. TECHNICAL REPORTS TO SPONSORING AGENCIES

A. U. S. Navy

1. Office of Naval Research

No.	Title	Author(s)	Contract
121	"Bibliography of Technical Reports, Publications and Theses, February 1959-February 1961," 28 February 1961		Nonr 375 (01)
122	"Observations of 4.3 mm Radiation During the Solar Eclipse of 15 February 1961," 20 April 1961	L. C. Krause W. W. Bahn T A. Walker C. W. Tolbert	Nonr 375 (01)
123	"Instrumentation and Techniques for Simultaneous Measurement and Synchronous Transcription of Tellurics," 31 May 1961	F. U. Williams F. H. Hopkins, Jr.	Nonr 375(01)
124	"Final Report on Research Activities in Millimeter Radio-waves and Geomagnetism," 31 July 1961		Nonr 375(01)
125	"Lunar Radiation at 4.3 mm During the 25 August 1961 Eclipse and the Lunar Model," 15 November 1961	C. W. Tolbert L. C. Krause R. M. Dickinson	Nonr 375(14)
126	"Micropulsation Sensors with Laminated Mumetal Cores," 25 May 1962	Lorimer K. Hill Francis X. Bostick, Jr.	Nonr 375(14)

No.	Title	Author(s)	Contract
127	"Investigation of Large Scale Inhomogeneities in the Earth by Magnetotelluric Method," 1 June 1962	F. X. Bostick, Jr.	Nonr 375(14)
128	"Report of Co-operative Geomagnetic Measurement Program of The Pacific Naval Laboratory, The University of British Columbia, The University of Alberta and The University of Texas, 31 May 1962	H. W. Smith	Nonr 375(14)
129	"General Dispersion Relations for a Partially-Ionized Gas," 28 February 1963	C. E. Prince, Jr. F. X. Bostick, Jr.	Nonr 375(14)
130	"A Survey of Geomagnetic Micropulsation Research Conducted in Connection with the Co-operative Geomagnetic Micropulsation Measurement Program" 15 May 1963	H. W. Smith	Nonr 375(14)
131	"Bibliography of Technical Reports, Publications and Theses," March 1961 through June 1963		Nonr 375(14)

B. U. S. Air Force

1. Aeronautical Systems Division, W-PAFB, Ohio

No.	Title	Author(s)	Contract
5-48	"Analysis of Resonant Cavity Techniques for Measurement of Effective Electron Density in a Plasma Stream," 30 June 1961	W. P. Cahill W. C. Dueterhoeft A. P. Deam	AF 33(616)-6257
5-49	"An Outline of the Basic Equations and Concepts of Plasma Dynamics," 30 September 1961	W. C. Dueterhoeft B. M. Fannin	AF 33(616)-6257
5-50	"Electron Density Measurements with a Pound System in Flowing Ionized Helium," 30 September 1961	A. P. Deam	AF 33(616)-6257
5-51	"Final Report," 30 September 1961		AF 33(616)-6257
5-52	Attenuation and Emission of 58 to 62 kMc/s Frequencies in the Earth's Atmosphere" Report of Research 1 September 1962 through 31 March 1963		AF 33(657)-7333
	A. Synopsis of Attenuation and Emission Investigations of 58 to 62 kMc/s Frequencies in the Earth's Atmosphere	C. W. Tolbert	
	B. Atmospheric Absorption of Radio Signals at 58 to 62 kMc/s	R. L. Sullivan	

No.	Title	Author(s)	Contract
C.	Spectroscopic Measurements of Oxygen Absorption Line Shape	L. F. Stafford	
D.	Emission at 60.3 kMc/s and Attenuation between 64.6 and 68.6 kMc/s in the Earth's Atmosphere	L. C. Krause W. W. Bahn	

2. Air Force Cambridge Research Laboratories

a. Geophysics Research Directorate

4-04	"Data Interpretation Procedures for the Cedar Hill Meteorological Tower Installation," 30 May 1961	W. S. Simpson	AF 19(604)-5556
4-05	"Total Attenuation, Scattering and Absorption Cross-Sections of Water Drops for Infrared Radiation," 31 August 1961	J. J. Stephens	AF 19(604)-7279
4-06	"A Digital Meteorological Data-Acquisition System," 15 January 1962	W. S. Mitcham	AF 19(604)-5556

No.	Title	Author(s)	Contract
4-07	"Operation and Performance of the Cedar Hill Meteorological Tower Facility"	W. S. Mitcham J. R. Gerhardt	AF 19(604)-5556
4-08	Final Report - "The Design of an Enclosure for the Investigation of Atmospheric Thermal Radiation Phenomena"	Claude Duchon Glen Willis	AF 19(604)-7279

b. Electronics Research Directorate

6-43	"Power Spectrum and Correlation Function Evaluation of Selected Tower Refractometer Measurements," 31 October 1961	G. B. Walker	AF 19(604)-8038
6-44	"Frequency Characteristics of Radio Propagation Over a Grove of Trees in Full Leaf," 15 January 1962	A. H. LaGrone C. W. Chapman P. E. Martin	AF 19(604)-8038
6-45	Final Report-Part I "The Investigation of Solar Emission and the Attenuation and Emission of the Earth's Atmosphere at the Frequencies of 69.75 and 94.0 kMc/s" 31 March 1962	C. W. Tolbert A. W. Straiton T. A. Walker	AF 19(604)-8036
6-46	Final Report-Part II "Microwave Line Shapes at Low Pressure" 31 March 1962	C. O. Britt C. E. Boggs	AF 19(604)-8036

No.	Title	Author(s)	Contract
6-47	"The Use of the TM _{omo} Cavity Modes for Dielectric Distribution" 15 July 1962	A. P. Deam	AF 19(604)-8038
6-48	Evaluation of Earth Probe Antennas for VLF Reception"	Paul E. Martin F. X. Bostick, Jr. A. P. Deam A. W. Straiton	AF 19(604)-8513
6-49	"Theoretical Study of the Bandwidth of Radio Propagation Media" 31 August 1962	B. M. Fannin	AF 19(604)-8038
6-50	"A Solution for <u>ELF</u> Propagation in the Earth-Ionosphere Cavity Bounded by an Inhomogeneous Anisotropic Ionospheric Medium" 31 October 1962	C. W. Chapman	AF 19(604)-8038
6-51	"An Approximate Solution of the Radio Field Strength in the Vicinity of a Grove of Trees" 15 January 1963	Alfred H. LaGrone	AF 19(604)-8038
6-52	"High Altitude Microvariations Within the Atmosphere's Radio Refractive-Index Profile" 28 February 1963	A. P. Deam G. B. Walker	AF 19(604)-8038
6-53	"Considering Forest Vegetation as an Imperfect Dielectric Slab" 31 May 1963	D. J. Pounds	AF 19(604)-8038
6-54	Title Classified 31 May 1963	Geo. Hopkins F. X. Bostick, Jr.	AF 19(604)-8513
6-55	"Antenna and Radio Wave Propagation Characteristics at VHF Near and in the Ground" 30 June 1963	D. M. Schwartz A. H. LaGrone	AF 19(604)-8038

C. U. S. Army

1. White Sands Missile Range

No.	Title	Author(s)	Contract
3	"Wind and Temperature in the Atmosphere Between 30 and 80 Km," Third Quarterly Technical Report, 1 January 1961 through 31 March 1961	K. H. Jehn N. K. Wagner J. R. Gerhardt	DA-23-072- ORD-1564
4	"Wind and Temperature in the Atmosphere Between 30 and 80 Km," Fourth Quarterly Technical Report, 1 April 1961 through 30 June 1961	N. K. Wagner D. R. Haragan K. H. Jehn	DA-23-072- ORD-1564
5	"Wind and Temperature in the Atmosphere Between 30 and 80 Km" Fifth Quarterly Technical Report, 1 July 1961 through 30 September 1961	N. K. Wagner D. R. Haragan K. H. Jehn J. R. Gerhardt	DA-23 -072 - ORD-1564
6	"Wind and Temperature in the Atmosphere Between 30 and 80 Km," Sixth Quarterly Technical Report, 1 October 1961 through 31 December 1961	D. R. Haragan N. K. Wagner J. R. Gerhardt	DA-23-072 ORD-1564
7.	"Wind and Temperature in the Atmosphere Between 30 and 80 Km," Seventh Quarterly Technical Report, 1 January 1962 through 31 March 1962	N. K. Wagner D. R. Haragan J. R. Gerhardt	DA-23-072 ORD-1564
8	"Wind and Temperature in the Atmosphere Between 30 and 80 Km," Eighth Quarterly Technical Report, 1 April 1962 through 30 June 1962	D. R. Haragan N. K. Wagner J. R. Gerhardt	DA-23-072 ORD-1564

No.	Title	Author(s)	Contract
9	"Wind and Temperature in the Atmosphere Between 30 and 80 Km," Ninth Quarterly Technical Report, 1 July 1962 through 30 September 1962	N. K. Wagner D. R. Haragan J. R. Gerhardt	DA-23-072 ORD-1564
10	"Wind and Temperature in the Atmosphere Between 30 and 80 Km," Tenth Quarterly Technical Report, 1 October 1962 through 31 December 1962	N. K. Wagner D. R. Haragan	DA-23-072 ORD-1564
11	"Wind and Temperature in the Atmosphere Between 30 and 80 Km," Eleventh Quarterly Technical Report, 1 January 1963 through 31 March 1963	D. R. Haragan N. K. Wagner	DA-23-072 ORD-1564

2. Signal Research and Development Laboratory

3	"Research in Tropical Meteorology," Third Quarterly Technical Report, 1 January 1961 through 31 March 1961	W. H. Portig V. C. Kowalik J. R. Gerhardt	DA-36-039 SC-84937
4	"Research in Tropical Meteorology - Final Report- Part I - Design of a Long Range Program of Basic Research in Tropical Meteorology," 30 June 1961	W. H. Portig J. R. Gerhardt	DA-36-039 SC-84937

No.	Title	Author(s)	Contract
5	"Research in Tropical Meteorology - Final Report- Part II - Some Mesoscale Meteorological Phenomena of the Caribbean Area," 30 June 1961	W. H. Portig V. C. Kowalik	DA-36-039 SC-84937
6	"Research in Tropical Meteorology - Final Report- Part III - Author Bibliography," 30 June 1961	W. H. Portig S. J. Durie	DA-36-039 SC-84937
7	"Research in Tropical Meteorology" First Interim Technical Report, 1 November 1961 through 28 February 1962	W. H. Portig J. R. Gerhardt	DA-36-039 SC-89179
8	"Research in Tropical Meteorology," Second Interim Technical Report, 1 March 1962 through 30 June 1962	W. H. Portig J. R. Gerhardt	DA-36-039 SC-89179
7-22	"Summary Proceedings of the Conference on Tropical Meteorology," 30 September 1962	W. H. Portig J. R. Gerhardt	DA-36-039 SC-89179

3. Electronics Research and Development Activity

7-19	"The Refractor-Reflector Antenna," 15 January 1962	R. M. Dickinson	DA-SIG-36- 039-61-G11
7-20	"Propagation Measurements in the Vicinity of the 183 Gc/s Water Vapor Line," 5 February 1962	G. T. Coats R. A. Bond C. W. Tolbert	DA-SIG-36- 039-61-G11

No.	Title	Author(s)	Contract
7-21	"Dispersion at Milli- meter Wavelengths in Methyl and Ethyl Alcohols," 31 May 1962	J. A. Saxton R. A. Bond G. T. Coats R. M. Dickinson	DA-SIG-36- 039-61-G11

IV. TECHNICAL PUBLICATIONS

No.	Title	Author(s)	Publication Source
144	"Microwave Refractive-Index Distributions Associated with the Central United States Cold Outbreak"	K. H. Jehn	<u>Bulletin of the American Meteorological Society</u> , Vol. 42, No. 2, February 1961, pp. 71-76
145	"Directional Properties and Phase Relations of the Magnetotelluric Field at Austin, Texas"	H. W. Smith L. D. Provazek F. X. Bostick, Jr.	<u>Journal of Geophysical Research</u> , Vol. 66, No. 3, March 1961, pp. 879-888
146	"An Analysis of Recent Measurements of the Atmospheric Absorption of Millimeter Radio Waves"	C. W. Tolbert A. W. Straiton	<u>Proceedings of IRE</u> , Vol. 49, No. 2, March 1961, pp. 649-650
147	"Radiation from a Current Filament above a Homogeneous Earth, with Application to Micropulsations"	P. F. Law B. M. Fannin	<u>Journal of Geophysical Research</u> , Vol. 66, No. 4, April 1961, pp. 1049-1060
148	"The Effect of the Time Constant of Radiosonde Sensors on the Measurement of Temperature and Humidity Discontinuities in the Atmosphere"	N. K. Wagner	<u>Bulletin of the American Meteorological Society</u> , Vol. 42, No. 5, pp. 317-320, May 1961
149	"Experimental Determinations of the Back-Scattering Cross-Sections of Water Drops and of Wet and Dry Ice Spheres at 3.2 Centimeters"	J. R. Gerhardt C. W. Tolbert S. A. Brunstein W. W. Bahn	<u>Journal of Meteorology</u> , Vol. 18, No. 3, pp. 340-347, June 1961

No.	Title	Author(s)	Publication Source
150	"Radar Cross-Sections for Water and Ice Spheres"	J. J. Stephens	<u>Journal of Meteorology</u> , Vol. 18, No. 3, pp. 348-359, June 1961
151	"Solar Emission at Millimeter Wave Lengths"	C. W. Tolbert A. W. Straiton	<u>Astrophysical Journal</u> , Vol. 134, No. 1, July 1961 pp. 91-95
152	"Electronic Disdrometer"	D. E. Clardy C. W. Tolbert	<u>The Review of Scientific Instruments</u> , Vol. 32, No. 8, pp. 916-919, August 1961
153	"Some Propagation Characteristics of High UHF Signals in the Immediate Vicinity of Trees"	A. H. LaGrone C. W. Chapman	<u>IRE Transactions on Antennas and Propagation</u> , Vol. AP-9, No. 5, Sept. 1961, pp. 487-491
154	"Theoretical Time Constant and Radiation Error of a Rocketsonde Thermistor"	N. K. Wagner	<u>Journal of Meteorology</u> , Vol. 18, No. 5, October 1961, pp. 606-614
155	"Further Studies of the Back-Scattering Cross-Sections of Water Drops and Wet-and Dry-Ice Spheres"	J. R. Gerhardt C. W. Tolbert	<u>Journal of Meteorology</u> , Vol. 18, No. 5, pp. 688-691, October 1961
156	"Nonresonant Dielectric Dispersion in Asymmetric Rotors"	J. E. Boggs A. P. Deam	<u>Journal of Chemical Physics</u> , Vol. 35, No. 4, pp. 1178-1180, October 1961
157	"Absorption Cross-Sections of Water Drops for Infrared Radiation"	J. J. Stephens J. R. Gerhardt	<u>Journal of Meteorology</u> , Vol. 18, No. 6, pp. 818-822, December 1961

No.	Title	Author(s)	Publication Source
158	"Spectrally Average Total Attenuation, Scattering, and Absorption Cross-Sections for Infrared Radiation"	J. J. Stephens	<u>Journal of Meteorology</u> , Vol. 18, No. 6, pp. 822-826, December 1961
159	"An Example of a Nocturnal, Low-Level Jet Stream"	J. R. Gerhardt	<u>Journal of the Atmospheric Sciences</u> , Vol. 19, No. 1, pp. 116-118, January 1962
160	"Digital Computation of the Mutual Impedance Between Thin Dipoles"	H. C. Baker A. H. LaGrone	<u>Transactions of the IRE</u> , PGAP, March 1962
161	"Height Gain Measurements at VHF and UHF Behind a Grove of Trees"	A. H. LaGrone P. E. Martin C. W. Chapman	<u>IRE Transactions on Broadcasting</u> , Vol. BC-9, No. 1, pp. 37-54, February 1963
162	"Meteorological Engineering" and "Engineering Meteorology"	K. H. Jehn	<u>Bulletin of the American Meteorological Society</u> , (correspondence) Vol. 43, No. 4, p. 156, April 1962
163	"Radiosonde for Atmospheric Refractive Index Measurements"	A. P. Deam	<u>Review of Scientific Instruments</u> , Vol. 33, No. 4, April 1962, pp. 438-441.
164	"They Can See the Wind"	J. R. Gerhardt A. W. Straiton	<u>Alcalde</u> , pp. 12-13 May 1962
165	"A Consideration of Microwave Radiation Associated with Particles in the Atmosphere of Venus"	C. W. Tolbert A. W. Straiton	<u>Journal of Geophysical Research</u> , Vol. 67, No. 5, pp. 1741-1744, May 1962

No.	Title	Author(s)	Publication Source
166	"Spectral Distribution of Atmospheric Index of Refraction Fluctuations"	A. W. Straiton A. P. Deam G. B. Walker	<u>National Aerospace Electronics Conference Proceedings 1962</u> Dayton, Ohio, May 14-16, pp. 711-718
167	"Lunar Radiation of 4.3 Millimeters during the 25 August 1961 Eclipse and the Lunar Model"	C. W. Tolbert L. C. Krause R. M. Dickinson	<u>National Aerospace Electronics Conference Proceedings, 1962</u> , Dayton, Ohio, May 14-16, pp. 733-740
168	'Observations of 4.3 MM Radiation During the Solar Eclipse of February 15, 1961"	C. W. Tolbert A. W. Straiton	<u>Astrophysical Journal</u> , Vol. 135, No. 3, pp. 822-826, May 1962
169	"Dispersion at the Millimeter Wavelengths in Methyl and Ethyl Alcohols"	J. A. Saxton R. A. Bond G. T. Coats R. M. Dickinson	<u>Journal of Chemical Physics</u> , Vol. 37, No. 9, pp. 2132-2138, November 1, 1962
170	"Spectra of Radio Refractive Index Between Ground Level and 5000 Feet Above Ground"	A. W. Straiton A. P. Deam G. B. Walker	<u>IRE Transactions on Antennas and Propagation</u> , Vol. AP-10, No. 6, pp. 732-737, November 1962
171	"A 1400-Foot Meteorological Tower with Automatic Data Readout"	J. R. Gerhardt W. S. Mitcham A. W. Straiton	<u>Proceedings of the IRE</u> , Vol. 50, No. 11, pp. 2263-2271, November 1962.
172	"The Application of Inverse Convolution Techniques to Improve Signal Response of Recorded Geophysical Data"	C. F. George H. W. Smith F. X. Bostick, Jr.	<u>Proceedings of the IRE</u> , Vol. 50, No. 11, pp. 2313-2319, November 1962.

No.	Title	Author(s)	Publication Source
173	"Investigation of Large-Scale Inhomogeneities in the Earth by the Magnetotelluric Method"	F. X. Bostick, Jr. H. W. Smith	<u>Proceedings of the IRE</u> , Vol. 50, No. 11, pp. 2339-2346, November 1962
174	"Earth Probe Antennas"	P. E. Martin A. W. Straiton	<u>Ground Support Equipment</u> , (G-S-E) Vol. 4, No. 5, Oct. -Nov. 1962, pp. 19-22
175	"Conference for the Planning of Research in Tropical Meteorology"	W. H. Portig	<u>Bulletin of the American Meteorological Society</u> , Vol. 44, No. 2, pp. 79-82, Feb. 1963.
176	"Mesoscale Association of a Low-Level Jet Stream with a Squall Line-Cold Front Situation"	J. R. Gerhardt	<u>Journal of Applied Meteorology</u> , Vol. 2, No. 1, pp. 49-55, February 1963
177	"The Sky is the Limit for Radar Tracking Accuracy"	A. W. Straiton	<u>Naval Research Reviews</u> , Vol. XVI, No. 4, pp. 14-16, April 1963.
178	"Shape of Oxygen Absorption Lines in the Microwave Region"	L. F. Stafford C. W. Tolbert	<u>Journal of Geophysical Research</u> , Vol. 68, No. 11, June 1, 1963, pp. 3431-3435

V. THESES

Doctor of Philosophy in Electrical Engineering, June 1961

96. Ittipon Padungchewit: "Analysis of Magnetotelluric Signals by Power Density Spectra Methods," supervised by H. W. Smith, The University of Texas.

Master of Science in Electrical Engineering, June 1961

97. Francis Xavier Bostick: "An Analysis of the Magnetotelluric Method for Determining Subsurface Resistivities," supervised by H. W. Smith, The University of Texas.
98. William Dent Simpson: "Data Interpretation Procedure for the Cedar Hill Meteorological Tower Installation," supervised by A. W. Straiton, The University of Texas.
99. Franklin Udolph Williams: "Instrumentation and Techniques for Simultaneous Measurement and Synchronous Transcription of Tellurics," supervised by H. W. Smith, The University of Texas.

Master of Science in Electrical Engineering, August 1961

100. Wilbur Patrick Cahill: "Analyses of Resonant Cavity Techniques for Measurement of Effective Electron Density in a Plasma Stream," supervised by W. C. Duesterhoeft, The University of Texas.

Doctor of Philosophy in Electrical Engineering, January 1962

101. Chester O. Britt: "The Microwave Absorption of Some Gases in the Millimeter Spectrum," supervised by A. W. Straiton, The University of Texas.

Master of Science in Electrical Engineering, January 1962

102. Richard M. Dickinson: "The Refractor-Reflector Antenna," supervised by A. W. Straiton, The University of Texas.
103. William Smith Mitcham: "A Digital Meteorological Data-Acquisition System," supervised by A. W. Straiton, The University of Texas,

104. Gene Bert Walker: "Power Spectrum and Correlation Function Evaluation of Selected Tower Refractometer Measurements," supervised by A. W. Straiton, University of Texas.

Doctor of Philosophy in Electrical Engineering, June 1962

105. H. Charles Baker: "The Evaluation of Mutual Impedance Between Two Thin Linear Antennas," supervised by A. H. LaGrone, The University of Texas,

Master of Science in Electrical Engineering, June 1962

106. Lorimer Kenneth Hill: "Micropulsation Sensors with Laminated Mumetal Cores," supervised by A. W. Straiton, The University of Texas.

Master of Science in Electrical Engineering, August 1962

107. William Richard Cooper, Jr.: "Magnetic Permeability in High Frequency Alternating Fields," supervised by A. H. LaGrone, The University of Texas.

108. Clovis Ray Hale: "A Transistorized Pulse-Width Coder," supervised by A. W. Straiton, The University of Texas.

Master of Science in Electrical Engineering, January 1963

109. Carroll W. Chapman: "A Solution for ELF Propagation in the Earth-Ionosphere Cavity Bounded by an Inhomogeneous Anisotropic Ionospheric Medium," supervised by B. M. Fannin, The University of Texas.

110. Howard Thomas Nerland: "Design Study of a Large Millimeter Wave Antenna," supervised by A. W. Straiton, The University of Texas.

111. Lannon F. Stafford: "Spectroscopic Measurement of Oxygen Absorption Line Shape," supervised by A. W. Straiton, The University of Texas.

112. Roy L. Sullivan, II: "Atmospheric Absorption of Radio Signals at 58 to 62 kMcs," supervised by A. W. Straiton, The University of Texas.

Doctor of Philosophy in Electrical Engineering, June 1963

113. Charles Floyd George, Jr.: "Application of Special Filtering Techniques to Well Log Analysis," supervised by H. W. Smith, The University of Texas.
114. Robert Couth Mathis: "A Lunar Echo Study at 425 MCS," supervised by A. W. Straiton, The University of Texas.

Master of Science in Electrical Engineering, June 1963

115. Donnie Joe Pounds: "Considering Forest Vegetation as an Imperfect Dielectric Slab," supervised by A. H. LaGrone, The University of Texas.

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