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RADAR BIBLIOGRAPHY FOR GEOSCIENTISTS

by

Robert L. Walters

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Technical Report 61-30

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ABSTRACT

The purpose of this bibliography is to provide a comprehensive source of background information emphasizing geological, agricultural, geographical, and related interpretations of modern high-resolution, Side-Looking Airborne Radar (SLAR) imagery.

Two hundred sixty-six references are cited and indexed, covering a broad spectrum of subjects from applied imagery analyses and interpretations to selected theoretical studies.

PREFACE

A work of caution to the users of this bibliography--this bibliography was initially prepared as a reference aid for the earth science staff of the Kansas University Center for Research in Engineering Science, Remote Sensing Laboratory. However, enough interest has been expressed by other scientists that the bibliography is being made available as a CRES report. Users will find that many of the cited references are easily obtainable while other references are very difficult or impossible to obtain. The bibliography cites a number of unpublished reports, manuscripts and presented papers which fall under the latter two categories. The unpublished material has been included to make the bibliography as complete as possible and to some extent to indicate chronological development of civilian radar interpretation and usage.

INTRODUCTION

The purpose of this bibliography is to provide a comprehensive source of background information in geoscience interpretation of radar imagery. The geoscience community have become increasingly aware of and interested in applications of radar to their own specific areas of investigation; hence this bibliography and associated index have been provided as a source for such background information. Numerous articles, reports, journals and texts have been examined in the reference acquisition search. Numerous references have been obtained from several excellent bibliographies such as that of P. E. Resta (1965) and J. E. Jones (1966). Among those reports, texts or articles that have extensive reference collections are F. D. Beatty, et al. (1965) and D. Levine, et al. (1966). However, in searching for reference material to be used in conjunction with the University of Kansas radar imagery evaluation efforts, it was determined that no single article, pre-existing bibliography, journal or text contained a comprehensive up-to-date reference collection devoted specifically to the field of radar image interpretation and analysis of natural resource subjects.

Of the imaging type radars, major emphasis has been devoted to the Side-Looking Radars (SLR or SLAR) and secondary emphasis on the Plan Position Indicator (PPI) type radars. A selected number of articles are also included which deal with terrain reflectivity or scatter measurements*, general theory of radar return, scatterometry and general information sources on peripheral subjects intimately related to the general study of radar energy measurements. The volume of reported data in the

*The reader is referred to a bibliography in the open literature on these subjects by H. A. Corriher, Jr. and B. D. Pyron (1965) A Bibliography of Articles on Radar Reflectivity and Related Subjects, 1957-1964: Proceedings of the Electrical and Electronic Engineers (IEEE), vol. 53, no. 8, pp. 1025-1064.

field of terrain reflectivity measurements is massive and only those references are included that are directly contributory to studies of radar imagery.

Initial collection efforts were primarily directed to references devoted to analysis or interpretation, but it soon became apparent that, as in the field of aerial photography where photo interpretation and photogrammetry are intimately related, the rising field of radargrammetry is related to radar image interpretation. Therefore, numerous references are included concerning articles on radargrammetric principles and equipment being used in radargrammetry operations.

Prior to scientific interest in the natural resources applications of radar data, the military was largely responsible for the development of high resolution radars with their map-like image capabilities, and the field of radar interpretation was developed by military intelligence interpreters interested in military information acquisition. Many interpretation principles and procedures developed by the military for target recognition purposes are equally applicable to civilian scientific investigations. This is particularly true with respect to the radar signatures of cultural features such as towns, communication and transportation networks, etc. Therefore, selected references are included, which, although primarily oriented to military purposes, do provide significant guidance to the civilian interpreter for radar signatures of cultural targets. In addition to the included unclassified references, there is a wide range of classified reports available to qualified applicants.

The bibliography was completed during the fall of 1967. Additions since that time period have been included in an Addendum section of the bibliography, and are those numbered 240 and up.

BIBLIOGRAPHY

1. Aero Service Corp. (1959) Vol. 1, Final Technical Report, Radar Mapping Test Ranges: Aero Services Corp. Volume I Report.
2. Ambrose, W. R. (1967) A Radar Image Correlation Viewer: Photogrammetric Engineering, vol. 33, no. 2, pp. 211-214.
3. American Society of Photogrammetry and Institute of Science and Technology, University of Michigan (1966) Selected Papers on Remote Sensing.
4. Anderson, V. H. (1962) Radar Imagery of Arctic Pack Ice, Kane Basin to North Pole: U.S. Army CRREL Special Report 94.
5. Anderson, V. H. (1966) High-Altitude, Side-Looking Radar Images of Sea Ice in the Arctic: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 845-857.
6. Badgley, P. C. (1965) The Applications of Remote Sensors in Planetary Exploration: Proceedings of the Third Symposium on Remote Sensing of Environment (October 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 9-28.
7. Badgley, P. C. (1966a) Current Status of NASA Natural Resources Program: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 547-570.
8. Badgley, P. C. (1966b) Planetary Exploration from Orbital Altitudes: Photogrammetric Engineering, vol. 33, no. 2, pp. 250-259.
9. Badgley, P. C. and L. Childs (In press) Use of Terrestrial Test Sites and Aircraft Flights in Preparing for Remote Sensing From Earth Orbital Spacecraft: Proceedings of the American Astronautical Society.
10. Badgley, P. C. and R. J. P. Lyon (1964) Lunar Exploration from Orbital Altitudes: Annals of the New York Academy of Sciences, vol. 123, art. 2, pp. 1198-1219.

11. Badgley, P. C. and W. L. Vest (1966) Orbital Remote Sensing and Natural Resources: Photogrammetric Engineering, vol. 32, no. 5, pp. 780-790.
12. Bailey, J. T., S. Evans and G. de Q. Robin (1964) Radio Ice Sounding of Polar Ice Sheets: Nature, vol. 204, no. 4957, pp. 420-441.
13. Barash, L. (1965a) Error Analysis for the Measurement of Terrain Elevation Variations due to Finite Sampling Rates in the Acquisition of Terrain Elevation Data: Goodyear Aerospace Corp. Report AEEM-164, AAP-22649, 30 pp.
14. Barash, L. (1965b) Two-Dimensional Analysis of Terrain Sampling: Goodyear Aerospace Corp. Report AEEM-175.
15. Barringer, A. R. (1963) The Use of Audio and Radio Frequency Pulses for Terrain Sensing: Proceedings of the Second Symposium on Remote Sensing of Environment (October 1962); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 201-213.
16. Barringer, A. R. (1966) The Use of Multi-Parameter Remote Sensors as an Important New Tool for Mineral and Water Resource Evaluation: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 313-325.
17. Barringer, A. R., D. W. Holdsworth and J. F. White (1966) Studies of the Radar Properties of Rocks in Vacuum and the Design of a Specialized Radar for Measuring Stratification Features of the Lunar and Terrestrial Surface: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 475-487.
18. Bateman, P. C. (1966) Geologic Evaluation of Radar Imagery of Flights 100-B and 100-C Across the Central Sierra, Nevada, California: U.S. Geological Survey Unpublished Report.
19. Beatty, F. D. and others (1965) Geoscience Potentials of Side-Looking Radar: Raytheon/Autometric Corp., 90 pp.
20. Beccasio, A. E. and J. H. Simons (1965) Regional Geologic Interpretation from Side-Looking Airborne Radar (SLAR): Photogrammetric Engineering, vol. 31, no. 3, p. 507 (Abs.).

21. Beckmann, P. (1965) Scattering by Composite Rough Surfaces: Proceedings of the Institute of Electrical and Electronics Engineers (IEEE), vol. 53, no. 8, pp. 1012-1015.
22. Beckmann, P. and A. Spizzichino (1963) The Scattering of Electromagnetic Waves from Rough Surfaces: MacMillan Co., New York City, 503 pp.
23. Bienvenu, L. and R. Pascucci (1962) Engineering Geology from Side-Looking Radar Records: Autometric Corp., 13 pp.
24. Boniwell, J. W. (1967) Some Recent Results with the INPUT Airborne EM System: The Canadian Mining and Metallurgical Bulletin, vol. 60, no. 659, pp. 325-332.
25. Bradie, R. A. (1967) SLAR Imagery for Sea Ice Studies: Photogrammetric Engineering, vol. 33, no. 7, pp. 763-766.
26. Brown, R. D., Jr. (1966) Geologic Evaluation of Radar Imagery: San Andreas Fault Zone from Stevens Creek, Santa Clara County to Mussel Rock, San Mateo County, California: U.S. Geological Survey Unpublished Report.
27. Cameron, H. L. (1964) Ice-Cover Surveys in the Gulf of St. Lawrence by Radar: Photogrammetric Engineering, vol. 30, no. 5, pp. 833-841.
28. Cameron, H. L. (1965a) Radar as a Surveying Instrument in Hydrology and Geology: Proceedings of the Third Symposium on Remote Sensing of Environment (October 1964); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 441-452.
29. Cameron, H. L. (1965b) Radar and Ice Surveys: Woods Hole Oceanographic Institute, Reference 65-10, Oceanography from Space, pp. 341-351.
30. Cameron, H. L. (1965c) Radar and Geology: U. S. Air Force Cambridge Research Laboratories Final Report AFCRL 65-202, 22 pp.
31. Carneggie, D. M. and D. T. Lauer (1966) Uses of Multiband Remote Sensing in Forest and Range Inventory: Photogrammetria, vol. 21, pp. 115-141.
32. Christiansen, R. L., K. L. Pierce, H. J. Prostka and E. T. Rupple (1966) Preliminary Evaluation of Radar Imagery of Yellowstone Park, Wyoming: U.S. Geological Survey Unpublished Report.

33. Claveloux, B. A. (1960) Sketching Projector for Side-Looking Radar Photography: Photogrammetric Engineering, vol. 26, no. 4, pp. 644-647.
34. Colbert, C. (1954) Parallax Equations for Determining Topographic Elevations from Radar Scope Photographs: Westgate Laboratory, Inc. Report, vol. 1, no. 3, pp. 1-16.
35. Colwell, R. N. (1966a) Uses and Limitations of Multispectral Remote Sensing: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 71-100.
36. Colwell, R. N. (1966b) Aerial Photography of the Earth's Surface; Its Procurement and Use: Applied Optics, vol. 5, no. 6, pp. 883-892.
37. Colwell, R. N., W. Brewer, G. Landis, P. Langley, J. Morgan, J. Kinker, J. M. Robinson and A. L. Sorem (1963) Basic Matter and Energy Relationships Involved in Remote Reconnaissance: Photogrammetric Engineering, vol. 29, no. 5, pp. 761-799, Report of Subcommittee I, Photo Interpretation Committee, American Society of Photogrammetry.
38. Cook, J. C. (1960) Proposed Monocycle-Pulse Very High Frequency Radar for Airborne Ice and Snow Measurement: Communication and Electronics (November 1960 issue).
39. Cook, J. C. (1963) Monocycle Radar Pulses as Environmental Probes: Proceedings of the Second Symposium on Remote Sensing of Environment (October 1962); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 223-234.
40. Cooper, J. R. (1966) Geologic Evaluation - Radar Imagery of the Twin Buttes Area, Arizona: U.S. Geological Survey Unpublished Report.
41. Cosgriff, R. L., W. H. Peake and R. C. Taylor (1960) Terrain Scattering Properties for Sensor System Design: Ohio State University Engineering Experiment Station Bulletin 181, vol. 29, no. 3 (Terrain Handbook II).
42. Crandall, C. J. (1963) Advanced Radar Map Compilation Equipment: Photogrammetric Engineering, vol. 29, no. 6, pp. 947-955.
43. Curtis, D. W. (1961) A Mathematical Model for Radar Return Statistics with Applications to Radar Mapping and Radar Altimetry: Goodyear Aerospace Corp. Report AEEM-217, AAP-13268, 92 pp.

44. Curtis, D. W. (1965) The Effects of Photographic Film Noise on the Storage and Retrieval of Information: Goodyear Aerospace Corp. Report AEEM-177.
45. Cutrona, L. J. (1961) A High Resolution Radar Combat Surveillance System: Institute of Radio Engineers (IRE), vol. MIL-5, pp. 127-131.
46. Dalke, G. W. (1967) Identification of Remote Objects by Means of Scatterometry Data and Application to Pisgah Crater: Kansas University CRES Report 61-17, 23 pp.
47. Davis, B. R., J. R. Lundien, and A. N. Williamson, Jr. (1966) Feasibility Study of the Use of Radar to Detect Surface and Ground Water: U.S. Army WES Technical Report No. 3-727, 93 pp.
48. Dellwig, L. F., M. E. Bickford, J. N. Kirk and R. L. Walters (1965) Remote Sensor Studies of the Pisgah Crater Area, California: A Preliminary Report: Kansas University CRES Technical Memorandum 61-18, 13 pp.
49. Dellwig, L. F., J. N. Kirk and R. L. Walters (1966) The Potential of Low Resolution Radar Imagery in Regional Geologic Studies: Journal of Geophysical Research, vol. 71, no. 20, pp. 4995-4998.
50. Dellwig, L. F. and R. K. Moore (1966) The Geological Value of Simultaneously Produced Like- and Cross-Polarized Radar Imagery: Journal of Geophysical Research, vol. 71, no. 14, pp. 3597-3601.
51. Develet, J. A., Jr. (1965) Image Design for Terrain Mapping Radar Systems: Institute of Electrical and Electronics Engineers (IEEE), Transactions on Information Theory, vol. IT-11.
52. Dulberger, L. H. (1963) Side-Looking Radar Makes Maps in Flight: Electronics, vol. 36 (March 22, 1963 issue), pp. 22, 24, 25.
53. Eckhardt, R. E. (1966) Comparison of Radar and Optical Photographic Measurements Techniques: Goodyear Aerospace Corp. Report AEEM-218, AAP-23697, 35 pp.
54. Ellermeier, R. D., A. K. Fung, and D. S. Simonett (1966) Some Empirical and Theoretical Interpretations of Multiple Polarization Radar Data: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 657-670.

55. Ellermeyer, R. D. and D. S. Simonett (1965) Imaging Radars on Spacecraft as a Tool for Studying the Earth: Proceedings of the Symposium on Electromagnetic Sensing of the Earth from Satellites (November 1965); Miami Beach, Florida, pp. L1-L20.
56. Ellermeyer, R. D., D. S. Simonett, and L. F. Dellwig (1967) The Use of Multi-Parameter Radar Imagery for the Discrimination of Terrain Characteristics: Institute of Electrical and Electronic Engineer's (IEEE) 1967 International Convention Record, Part II, pp. 127-135.
57. Esten, R. D. (1953) Radar Relief Displacement and Radar Parallax: U.S. Army Research and Development Laboratory Report No. 1294.
58. Evans, S. (1961) Polar Ionospheric Spread Echoes and Radio Frequency Properties of Ice Shelves: Journal of Geophysical Research, vol. 66, no. 12, pp. 4137-4141.
59. Evans, S. (1963) Radio Techniques for the Measurement of Ice Thickness: The Polar Record, vol. 11, no. 73, pp. 406-410.
60. Feder, A. M. (1957) The Application of Radar in Geologic Exploration: Cornell Aeronautical Laboratory, Inc. Report.
61. Feder, A. M. (1960a) Radar Geology: Master's Thesis, University of Buffalo, Graduate School of Arts and Sciences, Buffalo, New York.
62. Feder, A. M. (1960b) Interpreting Natural Terrain from Radar Displays: Photogrammetric Engineering, vol. 26, no. 4, pp. 618-630.
63. Feder, A. M. (1962) Radar Geology Can Aid Regional Oil Exploration: World Oil (July 1962 issue), pp. 130-138.
64. Feder, A. M. (1963) Programs in Remote Sensing of Terrain: Proceedings of the Second Symposium on Remote Sensing of Environment (October 1962); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 51-63.
65. Feder, A. M. (1964) Let's Use More of the Electromagnetic Spectrum: Gulf Coast Association Geologic Society Transactions, 14th Annual Convention, pp. 35-49.
66. Feder, A. M. (1965) Airborne Multisensing for Reconnaissance and Production: Paper presented to the Tulsa Geological Society, Tulsa, Oklahoma (1965). Abstract appears in Tulsa Geological Society Digest, vol. 33, p. 286, 1965.

67. Fiore, C. (1967) Side-Looking Radar Restitution: Photogrammetric Engineering, vol. 33, no. 2, pp. 215-220.
68. Fischer, W. (1963) An Application of Radar to Geological Interpretation: Proceedings of the First Symposium on Remote Sensing of Environment (February 1962); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 469-493.
69. Fung, A. K. (1966) On Depolarization of Electromagnetic Waves Backscattered from a Rough Surface: Planetary Space Science, vol. 14, pp. 563-568.
70. Fung, A. K. (1967a) Rough Surface Scattering and its Application to Earth and Moon Radar Returns: Kansas University CRES Report 105-1, 12 pp.
71. Fung, A. K. (1967b) Theory of Cross-Polarized Power Returned from a Random Surface: Applied Science Review, vol. 17, pp. 1-11.
72. Geleyense, M. and A. R. Barringer (1965) Recent Progress in Remote Sensing with Audio and Radio Frequency Pulses: Proceedings of the Third Symposium on Remote Sensing of Environment (October 1964); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 469-493.
73. Gillerman, E. (1967) Investigation of Cross-Polarized Radar on Volcanic Rocks: Kansas University CRES Report 61-25, 11 pp.
74. Goodyear Aerospace Corp. (1965a) Elevation Displacement in Radar Displays: Goodyear Aerospace Corp. Report GERA-39.
75. Goodyear Aerospace Corp. (1965b) Standard Map Projection and Radar Display: Goodyear Aerospace Corp. Report GERA-41.
76. Goodyear Aerospace Corp. (1958) Statistical Analysis of Arizona Terrain Radar Return Data: Goodyear Aerospace Corp. Report AAP-8237.
77. Goodyear Aerospace Corp. (1959) Airborne Terrain Return Measurements: Goodyear Aerospace Corp. Report GERA-451.
78. Goodyear Aerospace Corp. (Date unknown) Glossary of Radar Image Interpretation and Preliminary Draft of Suggested Radar Gram-metric Nomenclature: Goodyear Aerospace Corp. Report AAP-22681, 6 pp. and Attachment #1, Preliminary Draft, 10 pp.
79. Goodyear Aerospace Corp. (1960a) Integrated Reconnaissance System: Goodyear Aerospace Corp. Report GERA-496.

80. Goodyear Aerospace Corp. (1964a) Image Interpretation Annotated Bibliography: Goodyear Aerospace Corp. Report AAP-20557.
81. Goodyear Aerospace Corp. (1964b) Lesson Plan for RF-4C Radar Photo-Interpretation Courses: Goodyear Aerospace Corp. Report OCC-8044-12.
82. Graham, L. C. (1965a) Preliminary Analysis - Target Detection with Terrain Imaging Radar: Goodyear Aerospace Corp. Report AEEM-151, AAP-21850, 5pp.
83. Graham, L. C. (1965b) Binocular Radar Data Analyzer Instructions Manual: Goodyear Aerospace Corp. Report AAP-22675.
84. Graham, L. C. (1965c) Radar Image Geometry: Goodyear Aerospace Corp. Report AAP-23696, 7 pp.
85. Greer, J. D. (1964) Resolution in Photographic Materials: Goodyear Aerospace Corp. Report AAP-18933.
86. Greer, J. D., P. E. Resta and H. O. Rydstrom (1965) Information Retrieval Applied to Radar Map Film: Goodyear Aerospace Corp. Report AAP-21835.
87. Greer, J. D. (1967) Peaceful Applications of High-Resolution Side-Looking Radar: Goodyear Aerospace Corp. Report AAP-25895, 6 pp.
88. Hackman, R. J. (1966) Geologic Evaluation of Radar Imagery in Southern Utah: U.S. Geological Survey Unpublished Report.
89. Hagfors, T. (1967) A Study of the Depolarization of Lunar Radar Echoes: Radio Science, vol. 2, pp. 445-465.
90. Harwood, D. S. (1967) Radar Imagery: Parmachenee Lake Area, West-Central Maine: U.S. Geological Survey Unpublished Report.
91. Hilpert, L. S. (1966) Geologic Evaluation of Radar Imagery, Southwestern and Central Utah: U.S. Geological Survey Unpublished Report.
92. Hoffman, P. R. (1954) Interpretation of Radar Scope Photographs: Photogrammetric Engineering, vol. 20, no. 3, pp. 406-411.
93. Hoffman, P. R. (1958) Photogrammetric Applications of Radar Scope Photographs: Photogrammetric Engineering, vol. 24, no. 5, pp. 756-764.

94. Hoffman, P. R. (1959) Evaluation Report on Radar Data Plotting Board AR-8: U.S. Aeronautical Chart and Information Center Report.
95. Hoffman, P. R. (1960) Progress and Problems in Radar Photo Interpretation: Photogrammetric Engineering, vol. 26, no. 4, pp. 612-618.
96. Holdsworth, D. W. and A. R. Barringer (1966) Studies of the Radar Properties of Rock in Vacuum and the Design of a Specialized Radar for Measuring Stratification Features of the Lunar and Terrestrial Surface: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 475-487.
97. Holmes, R. F. (1967) Engineering Materials and Side-Looking Radar: Photogrammetric Engineering, vol. 33, no. 7, pp. 767-770.
98. Hood, A. D. (Date unknown) Analysis of Radar Ice Report Submitted by Hudson Bay Shipping: National Resources Council of Canada Report No. 4692.
99. Huck, W. L. (1965) Wright-Patterson Air Force Base Reconnaissance Multisensor Target Range: Wright-Patterson Air Force Avionics Laboratory, Research and Technology Division, Air Force Systems Command Technical Report AFAL-TR-65-266, 82 pp.
100. Irwin, W. P. (1966) Geologic Appraisal of Radar Imagery of Southwestern Oregon: U.S. Geological Survey Unpublished Report.
101. Jones, N. E. (1966) Bibliography of Remote Sensing of Resources: Prepared for the Earth Resources Survey Program, Space Applications Program, National Aeronautics and Space Administration by U. S. Army Corps of Engineers, Ft. Belvoir, Virginia.
102. Johnson, P. L. and T. C. Vogel (1966) Vegetation of the Yukon Flats Region Alaska: U.S. Army CRREL Research Report 209, pp. 31-36, 48.
103. Johnson, R. B. (1966) Geologic Evaluation of Radar Imagery of the Spanish Peaks Region, Colorado: U.S. Geological Survey Unpublished Report.
104. Katz, I. and L. M. Spetner (1960) Polarization and Depression-Angle Dependence on Radar Terrain Return: Journal of Research of the National Bureau of Standards, vol. 64D, no. 5, pp. 483-486.

105. Kinsman, F. E. (1965) Some Fundamentals of Non-Contact Electromagnetic Sensing for Geoscience Purposes: Proceedings of the Third Symposium on Remote Sensing of Environment (October 1964); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 495-515.
106. Kirk, J. N. and R. L. Walters (1966) Radar Imagery, a New Tool for the Geologist: The Compass of Sigma Gamma Epsilon, vol. 43, no. 2, pp. 85-93.
107. Kirk, J. N. and R. L. Walters (In press) Preliminary Report on Radar Lineaments in the Boston Mountains of Arkansas: The Compass of Sigma Gamma Epsilon, vol. 45, no. 2, pp. 122-127.
108. Knopf, A. J. (1960) Detection of Subsoil Objects by Electromagnetic Means; U.S. Army Engineer Research and Development Laboratory Report 1634-TR.
109. Konecny, G. and E. E. Derenyi (1966) Geometrical Considerations for Mapping from Scan Imagery: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 334-336.
110. Kover, A. N. (1967) Radar Imagery as an Aid in Geologic Mapping: Paper presented to 1967 ASP-ACSM Convention, Hilton Hotel, Washington, D. C. March 5-10, 1967.
111. Lancaster, C. W. and A. M. Feder (1966) The Multisensor Mission: Photogrammetric Engineering, vol. 32, no. 3, pp. 484-494.
112. LaPrade, G. L. (1962b) An Analytical and Experimental Study of Stereo for Radar: Photogrammetric Engineering, vol. 29, no. 2, pp. 294-300.
113. LaPrade, G. L. (1965) Glossary of Radar Image Interpretation: Goodyear Aerospace Corp. Report AAP-22681.
114. LaPrade, G. L. and L. C. Graham (1961) Simulation of Stereo by Radar: Goodyear Aerospace Corp. Report AAP-12470.
115. LaPrade, G. L. and H. O. Rydstrom (1961) The Geometry of Radar Imagery: Goodyear Aerospace Corp. Report AAP-13593.
116. Leighty, R. D. (1958) Ice Thickness and Depth Sounding of Lake Tuto: U.S. Army CRREL Technical Note.
117. Leighty, R. D. (1966) Terrain Information from High-Altitude Side-Looking Radar Imagery of an Arctic Area: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology; University of Michigan, Ann Arbor, pp. 575-597.

118. Leonardo, E. S. (1959) An Application of Photogrammetry to Radar Research: Photogrammetric Engineering, vol. 25, no. 3, pp. 375-380. Also, Goodyear Aerospace Corp. Report GERA-448.
119. Leonardo, E. S. (1963) Comparison of Imaging Geometry for Radar and Camera Photographs: Photogrammetric Engineering, vol. 29, no. 2, pp. 287-293.
120. Leonardo, E. S. (1964) Capabilities and Limitations of Remote Sensors: Photogrammetric Engineering, vol. 30, no. 6, pp. 1005-1010.
121. Leonardo, E. S. (1965) Reliability of Remote Sensor Imagery: Paper presented to American Society of Photogrammetry, Semiannual Meeting, September 1965, Dayton, Ohio.
122. Leonardo, E. S. and R. A. Tolliver (1960) A Photographic Method for Transformation of a Black and White Radar Map into Full-Color Presentation: Photogrammetric Engineering, vol. 26, no. 4, pp. 647-651.
123. Levi, L. (1958) Accurate Method for Correction of Slant Range Distortion in High Altitude Radars and a Contribution of the Optics of Reflecting Conical Surfaces: Journal of the Optical Society of America, vol. 48, no. 10.
124. Levine, D. (1957) Radar Parallax for Slant Range Displays, Sec. 2.7 of "Mapping from Airborne Radarscope Presentations": Northrop Aircraft Corp. Second Interm Technical Report, NAI-58-72.
125. Levine, D. (1959) Radar Cartography: Proceedings of the Sixth Annual East Coast Conference, Aeronautical and Navigational Electronics, Baltimore, Maryland, p. 11.1-11.5.
126. Levine, D. (1960a) Radargrammetry: McGraw-Hill Book Co., Inc., 322 pp.
127. Levine, D. (1963a) Principles of Stereoscopic Instrumentation for PPI Photography: Photogrammetric Engineering, vol. 29, no. 4, pp. 596-621.
128. Levine, D. (1963b) Automatic Production of Contour Maps from Radar Interferometer Data: Paper presented to American Society of Photogrammetry, Semiannual Meeting, September 1965, Dayton, Ohio.

129. Levine, D., C. Colbert, L. C. Graham, P. Crane and B. B. Scheps (1966) Combinations of Photogrammetric and Radargrammetric Techniques: Manual of Photogrammetry, Published by American Society of Photogrammetry (3rd Edition), George Banta Publ. Co., pp. 1003-1048.
130. Loelkes, G. L., Jr. (1965a) Radar--A Mapping and Charting Tool: Surveying and Mapping: (June 1965 issue)
131. Loelkes, G. L., Jr. (1965b) Mapping Detail Extraction and Image Enhancement from Side-Looking Radar Records: Paper presented to American Society of Photogrammetry, Semiannual Meeting, September 1965, Dayton, Ohio.
132. Lundien, J. R. (1965) Remote Measurement of Dielectric Constants and Conductivity for Soils: Proceedings of the Institute of Electrical and Electronics Engineers (IEEE), vol. 53, no. 4, pp. 420-421.
133. Lundien, J. R. (1966) Terrain Analysis by Electromagnetic Means: Radar Responses to Laboratory Prepared Soil Samples: U.S. Army WES Technical Report No. 3-639, Report 2, 55 pp.
134. Macchia, R. P. (1957) Radar Presentation Restitutor: Photogrammetric Engineering, vol. 23, no. 5, pp. 880-886.
135. MacDonald, H. C., P. A. Brennan and L. F. Dellwig (1967) Geologic Evaluation by Radar of NASA Sedimentary Test Site: Institute of Electrical and Electronics Engineers (IEEE) Transactions on Geoscience Electronics, vol. GE-5, no. 3, pp. 72-78.
136. Mann, C., A. Blache and C. Pettard (1958) Red River Project: Report 6-1, Autometric Corp.
137. McAnerney, J. M. (1966) Terrain Interpretation from Radar Imagery: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 731-750.
138. McAnerney, J. M. and V. L. Prentice (In preparation) Terrain Analysis from Side-Looking Radar Imagery Compared with Visual Photography: U.S. Army CRREL Technical Report.
139. McIlvenna, J. F. and C. Drane, Jr. (1965) On the Resolving Power of Ground Mapping Radar Antennas: Air Force Cambridge Research Laboratories Physical Science Paper No. 104, Report AFCRL-65-322, 64 pp.

140. Meier, M. F., R. H. Alexander and W. J. Campbell (1966) Multi-spectral Sensing Tests at South Cascade Glacier, Washington: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 145-159.
141. Meyer, M. A. (1966) Remote Sensing of Ice and Snow Thickness: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 183-192.
142. Moore, R. K. (1965a) Satellite Radar and Oceanography, An Introduction: Woods Hole Oceanographic Institute, Reference 65-10, Oceanography from Space, pp. 355-366.
143. Moore, R. K. (1965b) Radar as a Sensor: Kansas University CRES Report 61-7, 52 pp.
144. Moore, R. K. (1966) Radar Scatterometry--An Active Remote Sensing Tool: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 339-375.
145. Moore, R. K. and L. F. Dellwig (1966) Terrain Discrimination by Radar Image Polarization Comparison: Proceedings of the Institute of Electrical and Electronics Engineers (IEEE), vol. 54, no. 9, pp. 1213-1214.
146. Moore, R. K. and D. S. Simonett (1967) Potential Research and Earth Resources Studies with Orbiting Radars: Results of Recent Studies: Paper No. 67-767, American Institute of Aeronautics and Astronautics (AIAA), 4th Annual Meeting and Technical Display, Anaheim, California, October 1967, 21 pp.
147. Moore, R. K. and D. S. Simonett (1967) Radar Remote Sensing in Biology: BIOscience, vol. 17, no. 6, pp. 384-390.
148. Moore, R. K. and D. S. Simonett (In press) Contributions to National Academy of Science, National Research Council Publications, Multispectral Sensing of Agricultural Resources.
149. Morain, S. A. (1967) Field Studies on Vegetation at Horsefly Mountain, Oregon and its Relation to Radar Imagery: Kansas University CRES Report 61-22, 19 pp.
150. Morain, S. A. and D. S. Simonett (1966) Vegetation Analysis with Radar Imagery: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 605-622.

151. Morain, S. A. and D. S. Simonett (1967) K-Band Radar in Vegetation Mapping: Photogrammetric Engineering, vol. 33, no. 7, pp.730-740.
152. Morgan, J. O. and V. L. Prentice (1966) Third Symposium on Remote Sensing: Photogrammetric Engineering, vol. 32, no. 1, pp.98-108.
153. Newberry, L. E. (1960) Terrain Radar Reflectance Study: Photogrammetric Engineering, vol. 26, no. 4, pp. 630-637.
154. Nikodem, H. J. (1966) Effects of Soil Layering on the Use of VHF Radio Waves for Remote Terrain Analysis: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 691-703.
155. O'Herron, D. (Date unknown) Computer Simulation of the Profile of Two Out of Focus Targets: Goodyear Aerospace Corp. Report AEEM-156.
156. Olson, C. E., Jr. (1960) Elements of Photogrammetric Interpretation Common to Several Sensors: Photogrammetric Engineering, vol. 26, no. 4, pp. 651-656.
157. Orlando, C. (1967) Tactical Image Interpretation Facility: Photogrammetric Engineering, vol. 33, no. 1, pp. 92-99.
158. Page, R. M. (1962) The Early History of Radar: Proceedings of the Institute of Radio Engineers (IRE), vol. 50, no. 5, pp. 1232-1236.
159. Parker, D. C. and M. F. Wolff (1965) Remote Sensing: International Science and Technology, vol. 43 (July 1965 issue), pp. 20-31.
160. Pavejsil, D. J., R. S. Raven and P. Waterman (1961) Airborne Radar: Van Nostrand Co., Inc., Princeton, New Jersey.
161. Peake, W. H. (1959a) Theory of Radar Return from Terrain: Institute of Radio Engineers (IRE), National Convention Records, vol. 7, pt. 1, pp. 27-41.
162. Peake, W. H. (1959b) Interaction of Electromagnetic Waves with Some Natural Surfaces: Institute of Radio Engineers, Transactions on Antennas and Propagation (Special Supplement), vol. AP-7, pp. S324-S329.

163. Peake, W. H., R. L. Riegler and C. H. Schultz (1966) The Mutual Interpretation of Active and Passive Microwave Sensor Outputs: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 771-777.
164. Pierson, W. J., Jr., B. B. Scheps and D. S. Simonett (1965) Some Applications of Radar Return Data to the Study of Terrestrial and Oceanic Phenomena: Proceedings of the Third Goddard Memorial Symposium on Scientific Experiments for Manned Orbital Flight (March 1965), Washington, D. C., pp. 87-137.
165. Prentice, V. L. (1966) Geographic Interpretation of a Radar Image: Paper Presented to Annual Meeting of Association of American Geographers, Toronto, Ontario, Canada, August 30, 1966.
166. Prentice, V. L. (1967) Remote Sensing of Environment (Progress Report 1 August 1965 through 31 December 1966); University of Michigan, Institute of Science and Technology Report 4864-12-P, 22 pp.
167. Rawcliffe, R. D., W. W. Lichtenberger and H. W. Krone (1965) Optical Simulation of Radar Resolution: Journal of the Optical Society of America, vol. 49, pp. 887-890.
168. Reitz, E. A. and others (1959) Radar Terrain Return Study, Final Report: Measurements of Terrain Back-Scattering Coefficients with an Airborne X-Band Radar: Goodyear Aerospace Corp. Report GERA-463, 118 pp.
169. Resta, P. E. (1965) Image Interpretation Annotated Bibliography: Goodyear Aerospace Corp. Report AAP-20557.
170. Resta, P. E. (1965) Image Interpretation in a Space Environment: Photogrammetric Engineering, vol. 31, no. 6, pp. 1010-1017.
171. Resta, P. E. et al. (1967) Radargrammetric Nomenclature: Goodyear Aerospace Corp. Report AAP-24955A.
172. Richey, F. (1962) Radar Contrast Patterns of Airport Runways: Journal of the Optical Society of America, vol. 52, pp. 51-57.
173. Rinker, J. N., S. Evans and G. de Q. Robin (1966) Radio Ice-Sounding Techniques: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 793-800.

174. Rinker, J. N. and S. J. Mock (1967) Radar Ice Thickness Profiles, Northwest Greenland: U.S. Army CRREL Report No. CRREL-SR-103, 23 pp.
175. Roberts, R. J. (1966) Geological Evaluation of K-Band Radar Imagery, North-Central, Nevada: U.S. Geological Survey Unpublished Report.
176. Robinove, C. J. (1966) Geological Evaluation of Airborne and Space-borne Remote Sensing Data for Hydrologic Uses: U.S. Geological Survey Unpublished Report.
177. Rose, D. H. (1965) Final Image Error Relationships: Goodyear Aerospace Corp. Report AAP-22612.
178. Ross, J. (Date unknown) The Effects of Radar Resolution on Detection of Vehicles: Goodyear Aerospace Corp. Report AEEM-176.
179. Rouse, J. W., Jr. (1967) Radar Takes a New Look: Kansas Engineer, vol. 51, no. 2, 11, 18-21. (Published by the University of Kansas Engineering School).
180. Rouse, J. W., Jr., W. P. Waite and R. L. Walters (1966) Use of Orbital Radars for Geoscience Investigators: Proceedings of the Third Space Congress (March 1966), Cocoa Beach, Florida, pp. 77-94.
181. Rydstrom, H. O. (1961a) Results of Development of Map from Radar Photo - Los Angeles and Vicinity: Goodyear Aerospace Corp. Report AAP-13522.
182. Rydstrom, H. O. (1961b) Geologic Map of an Area in Southeastern Arizona Prepared from Radar Photography: Goodyear Aerospace Corp. Report AAP-13730, 6 p.
183. Rydstrom, H. O. (1961c) Generalized Geologic and Soils Interpretation of Radar Imagery for Kentucky-Tennessee Map Dated January 1961: Goodyear Aerospace Corp. Report AAP-13546.
184. Rydstrom, H. O. (1961d) The Preparation of Maps from Radar Photography: Goodyear Aerospace Corp. Report AAP-13594.
185. Rydstrom, H. O. (1961e) Stereoscopic Pairs of Radar Photographs: Goodyear Aerospace Corp. Report AEEM-90.
186. Rydstrom, H. O. (1966) Interpreting Local Geology from Radar Imagery: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 193-201. Also, Goodyear Aerospace Corp. Report GERA-1122, 9 pp.

187. Rydstrom, H. O. (1967) Interpreting Local Geology from Radar Imagery: Geological Society of America Bulletin, vol. 78, no. 3, pp. 429-436.
188. Rydstrom, H. O. and G. L. LaPrade (1961) The Geometry of Radar Imagery as Applied to Shapes Encountered in Mapping Problems: Goodyear Aerospace Corp. Report AAP-13593, 5pp.
189. Sattinger, I. H. and F. C. Polcyn (1966a) Peaceful Uses of Earth-Observation Spacecraft, Volume I: Introduction and Summary: Report 7219-1-F (I), Prepared by the Institute of Science and Technology, University of Michigan, Ann Arbor for the National Aeronautics and Space Administration, 57 pp.
190. Sattinger, I. J. and F. C. Polcyn (1966b) Peaceful Uses of Earth-Observation Spacecraft, Volume II: Survey Applications and Benefits: Report 7219-1-F (II), Prepared by the Institute of Science and Technology, University of Michigan, Ann Arbor for the National Aeronautics and Space Administration, 159 pp.
191. Sattinger, I. J. and F. C. Polcyn (1966c) Peaceful Uses of Earth-Observation Spacecraft, Volume III: Sensor Requirements and Experiments: Report 7219-1-F (III), Prepared by the Institute of Science and Technology, University of Michigan, Ann Arbor for the National Aeronautics and Space Administration, 222 pp.
192. Schaber, G. G. (1966) Radar Images - Meteor Crater, Arizona: U.S. Geological Survey Unpublished Report.
193. Scheps, B. B. (1957) Terrains -- Terrain Radar Interpretation Study (Antarctica): U.S. Geological Survey. Reprinted by U.S. Navy Antarctic Projects Office (USAPO Serial 0109, 31 August 1959).
194. Scheps, B. B. (1960) To Measure is to Know -- Geometric Fidelity and Interpretation in Radar Mapping: Photogrammetric Engineering, vol. 26, no. 4, pp. 637-644.
195. Scheps, B. B. (1962) The History of Radar Geology: Proceedings of the First Symposium on Remote Sensing (February 1962); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 79-81.
196. Scheps, B. B. (1965) Oceanographic Applications for Radar: Woods Hole Oceanographic Institute, Reference 65-10, Oceanography from Space, pp. 273-287.
197. Schmidt, R. E. (1964) Radar Mapping of Venus from an Orbiting Spacecraft: Proceedings of the Third Symposium on Remote Sensing of Environment (October 1964); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 51-62.

198. Sheridan, M. E. (1966) Preliminary Studies of Soil Patterns Observed in Radar Images, Bishop Area, California: U.S. Geological Survey Unpublished Report.
199. Simonett, D. S. (1966a) Future and Present Needs of Remote Sensing in Geography: Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 37-49.
200. Simonett, D. S. (1966b) Application of Color-Combined Multiple Polarization Radar Images to Geoscience Problems: Computer Applications in the Earth Sciences, A Colloquium on Classification Procedures; Computer Contribution 7, Kansas Geological Survey, University of Kansas, Lawrence, pp. 19-23.
201. Simonett, D. S. (1967) Geologic Remote Sensing: Proceedings of the Short Course on Geologic Remote Sensing, (December, 1967), Stanford University, Palo Alto, California, Section 3. (limited distribution).
202. Simonett, D. S. and D. A. Brown (1965) Spacecraft Radar as a Means for Studying the Antarctic: Kansas University CRES Report 61-4, 11 pp.
203. Simonett, D. S., J. E. Eagleman, A. B. Erhart, D. C. Rhodes and D. E. Schwarz (1967) The Potential of Radar as a Remote Sensor in Agriculture: 1. A Study with K-Band Imagery in Western Kansas: Kansas University CRES Report 61-21, 13 pp.
204. Simonett, D. S., A. B. Erhart, D. C. Rhodes and D. E. Schwarz (In preparation) The Potential of Radar as a Remote Sensor in Agriculture: 2. An Evaluation of Multiple Polarization K-Band Imagery in Western Kansas: Kansas University CRES Report.
205. Simonett, D. S. and S. A. Morain (1965) Remote Sensing from Spacecraft as a Tool for Investigating Arctic Environments: Kansas University CRES Report 61-5, 13 pp.
206. Simonett, D. S. and S. A. Morain (In preparation) Use of Radar for Mapping and Information--Gathering in Cloudy Environments: Kansas University CRES Report 61-18.
207. Simonett, D. S. and J. Thorp (In preparation) A Study of K-Band Radar in Regional Soil Mapping: Kansas University CRES Report.
208. Simons, J. H. (1965) Some Applications of Side-Looking Airborne Radar: Proceedings of the Third Symposium on Remote Sensing of Environment (October 1964); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 563-571

209. Simons, J. H. and A. D. Beccassio (1964) An Evaluation of Geoscience Applications of Side-Looking Airborne Mapping Radar: Raytheon/Autometric Corp., Alexandria, Virginia, 70 pp.
210. Simpson, R. B. (1966) Radar; Geographic Tool: Annals of the Association of American Geographers, vol. 56, no. 1, pp. 80-96.
211. Smith, H. P., Jr. (1948) Mapping by Radar--The Procedures and Possibilities of a New and Revolutionary Method of Mapping and Charting: USAF, Randolph Field, Texas.
212. Smith, N. (1962) Radar Technology and Remote Sensing: Proceedings of the First Symposium on Remote Sensing (February 1962); Institute of Science and Technology, University of Michigan, Ann Arbor, pp. 27-34.
213. Smyth, D. L. (1962) Radar Network Adjustment, Volume I, Technical Study: Northrop Space Laboratories Report NSL 62-67.
214. Snavely, P. D., Jr. and H. C. Wagner (1966) Geologic Evaluation of Radar Imagery, Oregon Coast: U.S. Geological Survey Unpublished Report.
215. Southwick, D. L. (1966) Geological Evaluation of Radar Imagery, Appalachian Piedmont, Harford and York Counties, Maryland and Pennsylvania: U.S. Geological Survey Unpublished Report.
216. Stillwell, J. E. (1963) Radar Network Adjustment: Photogrammetric Engineering, vol. 29, no. 6, pp. 955-959.
217. Swanson, D. A. (1966) Geologic Evaluation of Radar Imagery of the Central Part of the Oregon High Cascade Range: U.S. Geological Survey Unpublished Report.
218. Tabor, R. (1966) Application of Radar Imagery to a Geological Problem at Glacier Peak Volcano, Washington: U.S. Geological Survey Unpublished Report.
219. Taylor, R. C. (1959) Terrain Return Measurements at X-, K_u -, and K_a -Band: Institute of Radio Engineers, National Convention Records, vol. 7, pt. 1, pp. 19-26.
220. Texas Instruments, Inc. (1961) System Analysis for a Waterways Experiment Station Terrain Analysis Radar (Project WESTAR) Final Report Phase I: Texas Instruments Final Report, Project WESTAR, Phase I, Contract DA-22-079-eng-295.

221. Texas Instruments, Inc. (1963) System Analysis for a Waterway Experiment Station Terrain Analysis Radar (Project WESTAR) Phase II - Final Report and Engineering Handbook: Texas Instruments Final Report and Engineering Handbook, Project WESTAR, Phase II, Contract DA-22-079-eng-295.
222. Texas Instruments, Inc. (1965) Waterways Experiment Station Terrain Analysis Radar (Project WESTAR) Phase II - Final Report - Analysis of Results: Texas Instruments Final Report, Project WESTAR, Phase II, Contract DA-22-079-eng-295.
223. United States Army GIMRADA (1965) Multisensor Imagery Collection: Prepared for Earth Resources Survey Program, Space Applications Program, National Aeronautics and Space Administration, Washington, D. C. by U. S. Army Corps of Engineers, Ft. Belvoir, Virginia.
224. University of Michigan (1962) Proceedings of the First Symposium on Remote Sensing of Environment (February 1962): Institute of Science and Technology Report 4864-1-X₂, 110 pp.
225. University of Michigan (1963a) Proceedings of the Second Symposium on Remote Sensing of Environment (October 1962): Institute of Science and Technology Report 4864-3-X, 459 pp.
226. University of Michigan (1963b) Remote Sensing of Environment, Final Report: Institute of Science and Technology Report 4864-6-F, 71 pp.
227. University of Michigan (1965) Proceedings of the Third Symposium on Remote Sensing of Environment (October 1964): Institute of Science and Technology Report 4864-9-X, 821 pp.
228. University of Michigan (1966) Proceedings of the Fourth Symposium on Remote Sensing of Environment (April 1966): Institute of Science and Technology Report 4864-11-X, 871 pp.
229. Van Lopik, J. R. (1962) Optimum Utilization of Airborne Sensors in Military Geography: Photogrammetric Engineering, vol. 28, no. 5, pp. 773-778.
230. Waite, A. H. (1959) Ice Depth Soundings with Ultra-High Frequency Radio Waves in the Arctic and Antarctic, and Some Observed Over Ice Altimeter Errors: U.S. Army SRDL Technical Report 2092. Also, Proceedings of the Symposium on Environmental Factors Influencing Optimum Operations of Ordnance Material, San Antonio, Texas, 1960. Coordinated by Southwest Research Institute, San Antonio, Texas.

231. Walford, M. E. R. (1964) Radio Echo Sounding Through an Ice Shelf: Nature, vol. 204, no. 4956, pp. 317-319.
232. Walker, G. W. (1966) Evaluation of Radar Imagery of Highly Faulted Volcanic Terrain in Southeast Oregon: U.S. Geological Survey Unpublished Report.
233. Westinghouse Electric Corp. (1967) Side Look Radar: Westinghouse Electric Corp., Aerospace Division, Baltimore, Maryland, 45 pp. (limited distribution).
234. Widger, W. K., Jr. (1965) Satellite Radar Beam Geometry: Woods Hole Oceanographic Institute, Reference 65-10, Oceanography from Space, pp. 402-404.
235. Williams, P. L. (1966) Preliminary Report on Radar Imagery of Cedar City - Iron Springs Area, Utah: U.S. Geological Survey Unpublished Report.
236. Wise, D. U. (1967) Radar Geology and Pseudo-Geology on an Appalachian Piedmont Cross Section: Photogrammetric Engineering, vol. 33, no. 7, pp. 752-761.
237. Wolfe, E. W. (1966) Radar Imagery: Salton Sea Area, California: U.S. Geological Survey Unpublished Report.
238. Woods Hole Oceanographic Institute (1965) Oceanography from Space: Reference 65-10, 469 pp.
239. Yoritomo, K. T. (1965) All-Weather Mapping: Paper presented to American Society of Photogrammetry, Semiannual Meeting, September 1965, Dayton, Ohio, pp. 321-352.

ADDENDUM

240. Badgley, P. C., L. Childs and W. L. Vest (1967) The Application of Remote Sensing Instruments in Earth Resource Surveys: Geophysics, vol. 32, no. 4, pp. 588-589.
241. Colwell, R. N. (1968) Remote Sensing of Natural Resources: Scientific American, vol. 218, no. 1, pp. 60-61, 67, 68.
242. Draeger, W. C. and D. T. Lauer (1967) Present and Future Forestry Applications of Remote Sensing from Space: Paper No. 67-765, American Institute of Aeronautics and Astronautics (AIAA), 4th Annual Meeting and Technical Display, Anaheim, California, October 1967, p. 7.
243. Engineer Topographic Laboratory, U. S. Army (1966) Radar Geology Test Area, Willcox Playa, Arizona: Unpublished U. S. Army ETL Report, 7 pp.
244. Godbey, T. W. (1965) Oceanographic Satellite Radar Altimeter and Wind Sea Sensor: Woods Hole Oceanographic Institute, Reference 65-10, Oceanography from Space, pp. 21-26.
245. Goodyear Aerospace Corp. (1966) Calibration of an X-Band Radar for Measurement of Terrain Radar Returns, AN/APS-73(XH-4) Radar Set: Goodyear Aerospace Corp. Report GERA-1177, vol. II, Final Report, 72 pp.
246. Goodyear Aerospace Corp. (1967) All-Weather Surveillance with the AN/APQ-102A Side-Looking Radar: Goodyear Aerospace Corp. Report GIB-9081.
247. Greenwood, J. A., A. Nathan, G. Neuman, W. J. Pierson, F. C. Jackson and T. E. Pease (1967) Radar Altimetry from a Spacecraft and its Potential Applications to Geodesy and Oceanography: New York University Geophysical Sciences Laboratory Report TR-67-3, 94 pp.
248. Hoffer, R. M. (1967) Interpretation of Remote Multispectral Imagery of Agricultural Crops: Purdue University Agricultural Experiment Station Research Bulletin No. 831, Laboratory for Agricultural Remote Sensing Volume No. 1, pp. 17-18.
249. Katz, I. (1965) Radar Backscattering from the Sea: Woods Hole Oceanographic Institute, Reference 65-10, Oceanography from Space, pp. 367-376.
250. Lundien, J. R. (1967) Analysis of Scatterometry Data from Pisgah Crater: Kansas University CRES Report 118-2, 21 pp.

251. Masenthin, H. W. (1967) Scatterometer Data Analysis Techniques: Kansas University CRES Report 118-3, 9 pp.
252. McCoy, R. M. (1967) An Evaluation of Radar Imagery as a Tool for Drainage Basin Analysis: Kansas University CRES Report 61-31, 102 pp.
253. Marks, W. (1965) The Application of Airborne Radar Backscatter to Measurement of the State of the Sea: Woods Hole Oceanographic Institute, Reference 65-10, Oceanography from Space, pp. 377-391.
254. Meyer, W. D. (1967) Analysis of Radar Calibration Data: Goodyear Aerospace Corp. Report GERA-1314, Report No. 1, Final Report, 98 pp.
255. Moore, R. K. and W. J. Pierson (1965) Measuring Sea State and Estimating Surface Winds from a Polar Orbiting Satellite: Proceedings of the International Symposium on Electromagnetic Sensing of the Earth from Satellites, Miami Beach, Florida, November 1965, pp. R1-R28.
256. Nunnally, N. R. (1965) Integrated Landscape Analysis from Radar Imagery: Unpublished Manuscript, Department of Geography, East Tennessee State University, 13 pp.
257. Pierson, W. J., Jr. (Chairman) (1965) Measurement from Aircraft and Space Vehicles of Quantities Associated with Windwaves and Swell: Recommendations of the Panel on Windwaves and Swell, Woods Hole Oceanographic Institute, Reference 65-10, Oceanography from Space, pp. 351-353.
258. Pierson, W. J., Jr. (1965) Windwaves and Swell: Woods Hole Oceanographic Institute, Reference 65-10, Oceanography from Space, pp. 393-402.
259. Schaber, G. G. (1967) Radar Images--San Francisco Volcanic Field, Arizona--A Preliminary Evaluation: U.S. Geological Survey Unpublished Report.
260. Shay, R., et al. (1967) Remote Multispectral Sensing in Agriculture: Purdue University Agriculture Experiment Station Research Bulletin No. 832, Laboratory for Agricultural Remote Sensing Volume No. 12-14-100-8307(20), p. 20-22.
261. Simonett, D. S. (1967) Ground Truth Measurements to Support Radar Studies: Preliminary Report, National Aeronautics and Space Administration Manned Spacecraft Center, Earth Resources Survey Program Ground Truth Session, pp. 90-100.

262. Simonett, D. S. (In press) Potential of Radar Remote Sensors as Tools in Reconnaissance, Geomorphic, Vegetation and Soil Mapping: 9th Congress, International Soil Science Society, Adelaide, Australia, August 1968, 12 pp.
263. Simonett, D. S. (In press) Land Evaluation Studies with Remote Sensors in the Infrared and Radar Regions: Land Evaluation Symposium, a Joint CSIRO-UNESCO Symposium, Canberra, Australia, August 1968, 37 pp.
264. Tyler, G. L., Jr. (1967) Bistatic-Radar Imaging and Measurement Techniques for the Study of Planetary Surfaces: Stanford University Electronics Laboratories Scientific Report No. 19, 109 pp.
265. University of Michigan Institute of Science and Technology (1966) Selected Papers on Remote Sensing of Environment: Published by the American Society of Photogrammetry (ASP).
266. Westinghouse Electric Corp. (1963) The Effects of Weather on K_a-Band Radar: Westinghouse Electric Corp. Report 2-32364-YZ.

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APPENDIX II - ABBREVIATION EXPLANATION
AND REFERENCE ADDRESSES

1. Aero Service, Inc.
4219 Van Kirk Street
Philadelphia, Pennsylvania 19100
2. Air Force Avionics Laboratory
Research and Technology Division
Air Force Systems Command
Wright-Patterson Air Force Base,
Ohio 45433
3. American Society of Photogrammetry
(ASP) - American Congress on Sur-
veying and Mapping (ACSM)
6269 Leesburg Pike
Falls Church, Virginia 22046
4. Autometric Corp.
(See Raytheon Corp.)
5. Center for Research in Engineering
Science (CRES)
Remote Sensing Laboratory
University of Kansas
Lawrence, Kansas 66044
6. Cornell Aeronautical Laboratory, Inc.
of Cornell University
Buffalo, New York 14214
7. Department of Geography
East Tennessee State University
Johnson City, Tennessee 37602
8. Electronics Research Laboratories
Stanford University
Stanford, California 94305
9. Engineering Experiment Station
Antenna Laboratory
Ohio State University
1320 Kinnear Rd.
Columbus, Ohio 43210
10. Geophysical Sciences Laboratory
Department of Meteorology and
Oceanography
School of Engineering and Science
New York University
University Heights, New York 10453
11. Goodyear Aerospace Corp.
Arizona Division
Litchfield Park, Arizona 85340
12. Institute of Science and Technology
P.O. Box 618
University of Michigan
Ann Arbor, Michigan 48104
13. Laboratory for Agricultural Remote
Sensing
Agricultural Experiment Station
Purdue University
Lafayette, Indiana 47905
14. National Resources Council of Canada
Ottawa, Canada
15. Northrop Aircraft Corp.
Hawthorne, California 90250
16. Raytheon Corp.
Autometric Facility
Space and Information Division
4217 Wheeler Avenue
Alexandria, Virginia 22304
17. Remote Sensing Evaluation and
Coordination Staff (RESECS)
U.S. Geological Survey
Washington, D. C. 20242
18. Texas Instruments, Inc.
Science Services Division
6000 Lemmon Avenue
Dallas, Texas 75204

19. U.S. Air Force Aeronautical Chart
and Information Center (ACIC)
8900 South Broadway
St. Louis, Missouri
20. U.S. Air Force Cambridge Research
Laboratories (AFCRL)
Office of Aerospace Research
L.G. Hanscom Field
Bedford, Massachusetts 02139
21. U.S. Army Cold Regions Research
and Engineering Laboratory (CRREL)
Hanover, New Hampshire 03755
22. U.S. Army Engineer Topographic
Laboratory (ETL) (Formerly known
as U.S. Army Geodesy, Intelligence
and Mapping Research and Develop-
ment Agency, GIMRADA)
Geographic Information Systems Branch
Geographic Information Division
Ft. Belvoir, Virginia 22060
23. U.S. Army Engineer Research and
Development Laboratory (ERDL)
Ft. Belvoir, Virginia 22060
24. U.S. Army Signal Research and
Development Laboratory (SRDL)
Ft. Monmouth, New Jersey 07703
25. U.S. Army Waterways Experiment
Station (WES)
Corps of Engineers
Vicksburg, Mississippi 39181
26. University of Buffalo
Graduate School of Arts and Sciences
Buffalo, New York 14214
27. Westinghouse Electric Corp.
Aerospace Division
Friendship International Airport
P.O. Box 746
Baltimore, Maryland 21240
28. Westgate Laboratory, Inc.
506 S. High
Yellow Springs, Ohio 45387
29. Woods Hole Oceanographic Institute
Woods Hole, Massachusetts 02543