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**GEOPHYSICAL EFFECTS OF
HIGH-ALTITUDE NUCLEAR
EXPLOSIONS OF 1962**

AN ANNOTATED BIBLIOGRAPHY



by **EDMUND J. BLAU**

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INTRODUCTION

The effects of high-altitude nuclear explosions have been studied since the United States test series of 1958. The present compilation is concerned, however, only with geophysical effects produced by the high-altitude tests made in 1962, both American and Soviet. The specific tests covered are the American shots of 9 July, 20 and 26 October, and 1 and 4 November, and the Soviet shots of 22 and 28 October and 1 November. This series is of particular interest because of the creation as a result of the "Starfish" test of 9 July of an artificial radiation belt similar to the natural Van Allen belts. The extent and duration of this belt and the magnitude of other effects of the explosion greatly exceeded the results produced by earlier high-altitude nuclear tests and provided a stimulus for intensive investigation all over the world.

In this bibliography, articles of a purely theoretical nature have been omitted, as have those concerned only with radioactive fallout. Even with this limitation, the total of about 170 references, all published within two years, indicates the great interest in the subject. As might be expected, the largest number of articles are concerned with the Starfish explosion, since this was the earliest of the series and produced the most spectacular results. It is perhaps a little surprising to find no articles at all from the Soviet literature. A careful search, however, has failed to locate any discussion of these geophysical effects in the open Soviet scientific literature, although a number of articles in the Western literature are devoted to the Soviet test shots.

Since the titles of most of the articles are indicative of the type of observations made, annotations have been limited in most cases to a brief note identifying the particular explosion discussed in the article. All the articles were seen by the compiler unless indicated otherwise.

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99. C. E. McIlwain
THE RADIATION BELTS, NATURAL AND ARTIFICIAL
Science 142, 355-61 (1963).
USA: 9 July
USSR: 22 October; 28 October; 1 November
100. D. P. Miles and R. P. Lepping
MAGNETIC DISTURBANCES DUE TO THE HIGH-ALTITUDE NUCLEAR
EXPLOSION OF JULY 9, 1962 (Letter)
J. Geophys Res. 69, 547-8 (1964).
USA: 9 July

101. H. T. Motz and R. E. Carter
ARTIFICIAL RADIATION BELT STUDIES WITH A FISSION BETA-RAY
SOURCE
J. Geophys. Res. 68, 657-61 (1963).
USA: 9 July
102. F. S. Mozer, D. D. Elliott, J. D. Mihalov, G. A. Paulikas,
A. L. Vampola, and S. C. Freden
PRELIMINARY ANALYSIS OF THE FLUXES AND SPECTRUMS OF TRAPPED
PARTICLES AFTER THE NUCLEAR TEST OF JULY 9, 1962
J. Geophys. Res. 68, 641-9 (1963).
USA: 9 July
103. M. P. Nakada
SYNCHROTRON RADIATION CALCULATIONS FOR THE ARTIFICIAL
RADIATION BELT
J. Geophys. Res. 68, 4079-89 (1963).
USA: 9 July
104. S. H. Neff
PHOTOMETRIC OBSERVATIONS OF AN ARTIFICIAL AURORA (Letter)
J. Geophys. Res. 68, 587-8 (1963).
USA: 9 July
105. S. H. Neff, G. A. M. King, and C. H. Cummack
AIR-GLOW EMISSIONS AND IONOSPHERIC EFFECTS FOLLOWING THE
JOHNSTON ISLAND NUCLEAR EXPLOSION ON 9 JULY
New Zealand J. Geol. Geophys. 5, 933-8 (1962).
USA: 9 July

106. Nguyen-Huu-Doan

TWILIGHT EXCITATION OF THE RESONANCE LINE OF LITHIUM
(6708 Å) OBSERVED AT THE HAUTE PROVENCE OBSERVATORY
DURING NOVEMBER 1962

Compt. Rend. 256, 1141-3 (1963).

Effect attributed to thermonuclear explosions,
possibly 26 October and 28 October.

107. K. Nishikori, Y. Nakata, and A. Sakurazawa

RADIO OBSERVATIONS ON THE HIGH-ALTITUDE NUCLEAR EXPLOSION
OVER JOHNSTON ISLAND ON JULY 9, 1962

Report of Ionosphere and Space Research in Japan 17, 47-51
(1963); J. Radio Res. Labs. 10, 85-105 (1963). [Probably
identical in content]

USA: 9 July

108. B. J. O'Brien

THE INJUN SATELLITES

Naval Res. Revs. 16, No. 3, 15-19 March 1963.

USA: 9 July

109. B. J. O'Brien

GEOPHYSICAL RESEARCH WITH SATELLITES INJUN I, II, AND III

"Scientific Satellites" (Advances in the Astronautical
Sciences, Volume 12). American Astronautical Society,
1963. pp 97-125.

USA: 9 July

110. B. J. O'Brien

REVIEW OF STUDIES OF TRAPPED RADIATION WITH SATELLITE-
BORNE APPARATUS

Space Sci. Revs. 1, 415-84 (1963).

USA: 9 July

111. Deleted

112. B. J. O'Brien, C. D. Laughlin, and J. A. Van Allen
GEOMAGNETICALLY TRAPPED RADIATION PRODUCED BY A HIGH-
ALTITUDE NUCLEAR EXPLOSION ON JULY 9, 1962
Nature 195, 939-43 (1962).

USA: 9 July

113. B. J. O'Brien, C. D. Laughlin, and J. A. Van Allen
PRELIMINARY STUDY OF THE GEOMAGNETICALLY-TRAPPED
RADIATION PRODUCED BY A HIGH-ALTITUDE NUCLEAR
EXPLOSION ON JULY 9, 1962
State Univ. of Iowa Research Report of 16 August 1962.

USA: 9 July [Not seen]

114. B. J. O'Brien, J. A. Van Allen, and C. D. Laughlin
PRELIMINARY REPORT OF DETECTION OF ARTIFICIALLY INJECTED
ELECTRONS WITH THE SATELLITE INJUN I
State Univ. of Iowa Research Report of 31 July 1962.

USA: 9 July [Not seen]

115. G. R. Ochs
FURTHER OBSERVATIONS OF SYNCHROTRON RADIATION DECAY (Letter)
J. Geophys. Res. 69, 1014-6 (1964).

USA: 9 July

116. G. R. Ochs, D. T. Farley, Jr., K. L. Bowles,
and P. Bandyopadhyay
OBSERVATIONS OF SYNCHROTRON RADIO NOISE AT THE MAGNETIC
EQUATOR FOLLOWING THE HIGH-ALTITUDE NUCLEAR EXPLOSION
OF JULY 9, 1962
J. Geophys. Res. 68, 701-11 (1963).

USA: 9 July

117. F. K. Odencrantz
ELECTROMAGNETIC EFFECTS FROM HIGH-ALTITUDE NUCLEAR
EXPLOSIONS (Letter)
J. Geophys. Res. 68, 2057 (1963).

USA: 26 October; 1 November

118. F. K. Odencrantz and H. E. Cronin
6300 A AIRGLOW INDUCED BY HYDROMAGNETIC WAVES FROM A
THERMONUCLEAR EXPLOSION (Letter)
J. Geophys. Res. 68, 6210-2 (1963).

USA: 9 July

119. F. K. Odencrantz, P. Saint-Amand, and J. G. Moore
ZENITH AIRGLOW OBSERVATIONS DURING THE HIGH-ALTITUDE
NUCLEAR EXPLOSION OF JULY 9, 1962 (Letter)
J. Geophys. Res. 67, 4091-2 (1962).

USA: 9 July

120. E. J. Oelbermann, Jr. and J. M. Musser
AN ANALOG METHOD FOR DETERMINING NEUTRON SHADOW-CONE
GEOMETRY FOR HIGH-ALTITUDE NUCLEAR TESTS (Letter)
J. Geophys. Res. 69, 3733-40 (1964).

USA: 9 July

121. G. A. Paulikas and S. C. Freden
PRECIPITATION OF ENERGETIC ELECTRONS INTO THE ATMOSPHERE
J. Geophys. Res. 69, 1239-49 (1964).
USA: 9 July
122. A. M. Peterson and G. L. Hower
SYNCHROTRON RADIATION FROM HIGH-ENERGY ELECTRONS
J. Geophys. Res. 68, 723-34 (1963).
USA: 9 July
123. A. G. Petschek
INTERPRETATION OF SATELLITE DETECTOR COUNTER RATES
J. Geophys. Res. 68, 663-5 (1963).
USA: 9 July
124. G. F. Pieper
THE ARTIFICIAL RADIATION BELT
APL Tech. Digest 2, No. 2, 3-7 (Nov.-Dec. 1962).
USA: 9 July
125. G. F. Pieper
A SECOND RADIATION BELT FROM THE JULY 9, 1962,
NUCLEAR DETONATION
J. Geophys. Res. 68, 651-5 (1963).
USA: 9 July

126. G. F. Pieper, D. J. Williams, and L. A. Frank
TRAAC OBSERVATIONS OF THE ARTIFICIAL RADIATION BELT
FROM THE JULY 9, 1962, NUCLEAR DETONATION
J. Geophys. Res. 68, 635-40 (1963).
USA: 9 July
127. P. R. Pisharoty
GEOMAGNETIC DISTURBANCES ASSOCIATED WITH THE NUCLEAR
EXPLOSION OF JULY 9
Nature 196, 822-4 (1962).
USA: 9 July
128. M. J. Poletti and M. Gadsden
OBSERVATIONS OF EARTH-POTENTIAL GRADIENTS AT THE TIME
OF A HIGH-ALTITUDE THERMONUCLEAR EXPLOSION (Research Note)
J. Atmos. Terr. Phys. 25, 47-50 (1963).
USA: 9 July
129. W. Riedler, A. Egeland, R. Lindquist, and A. Pedersen
EFFECTS OF NUCLEAR EXPLOSIONS ON VERY-LOW-FREQUENCY
AND LOW-FREQUENCY PROPAGATION (Letter)
Nature 198, 1076-7 (1963).
USSR: 22 October; 28 October
130. P. Rohan, L. L. Anderson, and D. J. Cooke
EFFECT OF THE U. S. HIGH-ALTITUDE NUCLEAR EXPLOSION
ON RADIO WAVE PROPAGATION (Letter)
Nature 197, 887-8 (1963).
USA: 9 July

131. J. Roquet, R. Schlich, and E. Selzer
WORLD-WIDE DISTURBANCE OF SHORT DURATION IN THE
GEOMAGNETIC FIELD OBSERVED IN FRANCE AT THE TIME OF
THE HIGH-LEVEL NUCLEAR EXPLOSION ON 9 JULY 1962
Compt. Rend. 255, 549-51 (1962).
USA: 9 July
132. J. Roquet, R. Schlich, and E. Selzer
QUASI-SIMULTANEOUS RECEPTION IN FRANCE, AT KERGUELEN
AND IN TERRE ADÉLIE OF THE PERTURBATION OF THE EARTH'S
MAGNETIC FIELD PRODUCED BY THE NUCLEAR EXPLOSION IN
SPACE ON 9 JULY 1962
Compt. Rend. 255, 1225-7 (1962).
USA: 9 July
133. J. Roquet, R. Schlich, and E. Selzer
EVIDENCE OF TWO DISTINCT SYNCHRONOUS WORLD IMPETUSES
FOR THE MAGNETIC EFFECTS OF THE NUCLEAR HIGH-ALTITUDE
DETONATION OF JULY 9, 1962 (Letter)
J. Geophys. Res. 68, 3731-2 (1963).
USA: 9 July
USSR: 22 October; 28 October
134. P. Rothwell, J. H. Wager, and J. Sayers
EFFECT OF THE JOHNSTON ISLAND HIGH-ALTITUDE NUCLEAR
EXPLOSION ON THE IONIZATION DENSITY IN THE TOPSIDE
IONOSPHERE (Letter)
J. Geophys. Res. 68, 947-9 (1963).
USA: 9 July
135. R. A. Santirocco and D. G. Parker
MAGNETOTELLURIC AND VERY LOW FREQUENCY SIGNATURES FROM
SMALL HIGH-ALTITUDE NUCLEAR EXPLOSIONS (Letter)
Nature 199, 1273-5 (1963).
USA: 20 October; 26 October; 1 November; 4 November

136. R. A. Santirocco and D. G. Parker
GEOPHYSICAL EFFECTS OF 1962 U. S. HIGH-ALTITUDE NUCLEAR
TESTS (OBSERVED IN ROCHESTER, NEW YORK)
Proc. Indian Acad. Sci. A59, 77-92 (1964).
USA: 9 July; 20 October; 26 October;
1 November; 4 November
137. C. F. Sechrist, Jr.
VLF ANOMALIES OBSERVED AT STATE COLLEGE, PA., DURING
THE U. S. 1962 HIGH-ALTITUDE NUCLEAR TESTS
J. Research Natl. Bur. Standards, Radio Science
68D, 125-33 (1964).
USA: 9 July; 20 October; 26 October;
1 November
138. G. G. Shepherd and A. R. Bens
FINE AND HYPERFINE STRUCTURE OF TWILIGHT LITHIUM
EMISSION, NOVEMBER 1962 (Letter)
Nature 198, 470 (1963).
USA: 26 October
139. K.V. Sheridan and J. Joisce
SWEPT-FREQUENCY RADIO OBSERVATIONS AT THE TIME OF THE
NUCLEAR EXPLOSION OVER JOHNSTON ISLAND ON JULY 9, 1962
Australian J. Phys. 16, 584-5 (1963). (Short communication)
USA: 9 July
140. S. F. Singer
NUCLEAR EXPLOSIONS IN SPACE
Nature 196, 307-14 (1962).
USA: 9 July

141. R. V. Smith and W. L. Imhof
SATELLITE MEASUREMENTS OF THE ARTIFICIAL RADIATION BELT
J. Geophys. Res. 68, 629-33 (1963).
USA: 9 July
142. R. V. Smith, W. L. Imhof, J. C. Bakke, J. B. Reagan, and
J. H. Rowland
MEASUREMENTS OF ARTIFICIALLY INJECTED ELECTRONS FROM
SATELLITE 1962 BETA KAPPA (Final Report)
Lockheed Missiles and Space Co. Report LMSC-3-05-63-1.
August 1963. 31 pp. STAR 2, Abs. N64-12181, p. 266 (1964).
The satellite referred to is Starad, launched
26 October 1962. [Not seen]
143. W. Stoffregen, H. Derblom, and B. Ånger
LITHIUM EMISSION AT TWILIGHT AT UPPSALA DURING NOVEMBER
1962 (Letter)
Nature 197, 783-5 (1963).
USSR: specific explosions not certain
144. R. M. Straka, P. G. Elkins, and H. A. Strick
DECAMETRIC WAVE-LENGTH ABSORPTION RESULTING FROM THE
NUCLEAR DETONATION OF JULY 9, 1962 (Letter)
Nature 196, 156-7 (1962).
USA: 9 July
145. W. M. Strome and R. C. Baker
OBSERVATIONS OF UNUSUAL GEOMAGNETIC FLUCTUATION
National Research Council (Canada), Div. of Mechanical
Eng. and the National Aeronautical Establishment,
Quarterly Bull. No. 3, 33-7 (1962); International
Aerospace Abstr. 3, Abs. A63-12815, p. 349 (1963).
Probably USA: 9 July [Not seen]

146. H. M. Sullivan and D. M. Hunten
LITHIUM, SODIUM, AND POTASSIUM IN THE TWILIGHT AIRGLOW
Can. J. Phys. 42, 937-56 (1964).
USA: 9 July
Unidentified October and November explosions,
both USA and USSR.
147. D. W. Swift
RESULTS OF RIOMETER MEASUREMENTS AT ROCKPORT, MASSACHUSETTS,
DURING THE HIGH-ALTITUDE NUCLEAR EXPLOSION OF JULY 9, 1962
(Letter)
J. Geophys. Res. 68, 5093-6 (1963).
USA: 9 July
148. Y. Takenoshita, C. Outi, and K. Sinno
RADIO ~~OBSERVATIONS~~ ON THE HIGH-ALTITUDE NUCLEAR EXPLOSION
OVER JOHNSTON ISLAND ON JULY 9, 1962
J. Radio Res. Labs. 10, 107-25 (1963).
USA: 9 July
149. P. P. Tamarkin
EFFECTS OF NEUTRONS FROM HIGH-ALTITUDE DETONATIONS (Letter)
J. Geophys. Res. 69, 2861-6 (1964).
USA: 9 July
150. B. A. Tinsley
RIOMETER OBSERVATIONS OF HF NOISE AT SAMOA FOLLOWING
HIGH-ALTITUDE NUCLEAR TEST
New Zealand J. Geol. Geophys. 5, 964-8 (1962).
USA: 9 July

151. B. A. Tinsley

SPECTROGRAM OF ARTIFICIAL AURORA NEAR SAMOA OF JULY 9,
1962, AND ASSOCIATED LITHIUM EMISSION IN TWILIGHT

Can. J. Phys. 42, 779-93 (1964).

USA: 9 July

152. J. E. Titheridge

VARIATIONS IN THE TOTAL ELECTRON CONTENT OF THE IONOSPHERE
AFTER THE HIGH-ALTITUDE NUCLEAR EXPLOSION

New Zealand J. Geol. Geophys. 5, 1003-8 (1962).

USA: 9 July

153. R. L. Trainor and L. J. Derrick

EFFECT OF THE U. S. HIGH-ALTITUDE NUCLEAR TEST SERIES
OF 1962 ON RADIO PROPAGATION (Letter)

Nature 201, 694-5 (1964).

USA: 9 July; 20 October; 26 October; 1 November;
4 November (explosion of 22 October also
discussed)

154. R. R. Unterberger and P. E. Byerly

MAGNETIC EFFECTS OF A HIGH-ALTITUDE NUCLEAR EXPLOSION
(Letter)

J. Geophys. Res. 67, 4929-32 (1962).

USA: 9 July

155. R. S. Unwin, M. Gadsden, C. T. Lewis, and D. S. Rowles

OPTICAL AND IONOSPHERIC EFFECTS OF THE NUCLEAR EXPLOSION
OF 9 JULY 1962

New Zealand J. Geol. Geophys. 5, 939-42 (1962).

USA: 9 July

156. J. A. Van Allen

SPATIAL DISTRIBUTION AND TIME DECAY OF THE INTENSITIES
OF GEOMAGNETICALLY TRAPPED ELECTRONS FROM THE HIGH
ALTITUDE NUCLEAR BURST OF JULY 1962

State Univ. of Iowa Research Report SUI-63-11. April 1963.

USA: 9 July [Not seen]

157. J. A. Van Allen

REMARKS ON THE ARTIFICIAL RADIATION BELT PRODUCED BY THE
9 JULY 1962 NUCLEAR DETONATION ("STARFISH")

State Univ. of Iowa Research Report SUI-63-18. May 1963.

USA: 9 July

158. J. A. Van Allen

FURTHER OBSERVATIONS ON THE STARFISH AND SOVIET ARTIFICIAL
RADIATION BELTS

State Univ. of Iowa Research Report SUI-63-37, November 1963.
25 pp.

USA: 9 July

USSR: 22 October; 28 October

159. J. A. Van Allen, L. A. Frank, and B. J. O'Brien

SATELLITE OBSERVATIONS OF THE ARTIFICIAL RADIATION BELT
OF JULY 1962

State Univ. of Iowa Research Report 62-26.

USA: 9 July [Not seen]

160. J. A. Van Allen, L. A. Frank, and B. J. O'Brien

SATELLITE OBSERVATIONS OF THE ARTIFICIAL RADIATION BELT OF
JULY 1962

J. Geophys. Res. 68, 619-27 (1963).

USA: 9 July

161. A. M. van Wijk
MAGNETIC EFFECTS OF HIGH-ALTITUDE BOMB (Letter)
J. Geophys. Res. 67, 5352 (1964).
USA: 9 July
162. H. D. Webb and F. B. Daniels
IONOSPHERIC OSCILLATIONS FOLLOWING A NUCLEAR EXPLOSION
(Letter)
J. Geophys. Res. 69, 545-6 (1964).
USSR: 1 November
163. J. A. Welch, Jr., R. L. Kaufmann, and W. N. Hess
TRAPPED ELECTRON TIME HISTORIES FOR $L = 1.18$ to $L = 1.30$
J. Geophys. Res. 68, 685-99 (1963).
USA: 9 July
164. J. A. Welch, R. Kaufmann, J. Taylor, and W. N. Hess
SCATTERING LOSS OF FISSION BETA PARTICLES FROM HIGH-
ALTITUDE EXPLOSIONS
Air Force Special Weapons Center. Report TDR-62-72.
August 1962.
[Not seen]
165. H. I. West, Jr., L. G. Mann, and S. D. Bloom
SPECTRA AND FLUXES OF ELECTRONS TRAPPED IN THE EARTH'S
MAGNETIC FIELD FOLLOWING RECENT HIGH-ALTITUDE NUCLEAR
BURSTS
Univ. of California, Lawrence Radiation Lab. Report
UCRL-7309 Rev. 1. 10 April 1963. 31 pp. STAR 1,
Abs. N63-19921, p. 1479 (1963).
Concerns high-altitude event observed on 28 October
[Not seen]

166. H. R. Willard and J. F. Kenney
IONOSPHERIC EFFECTS OF HIGH-ALTITUDE NUCLEAR TESTS (Letter)
J. Geophys. Res. 68, 2053-6 (1963).

USA: 26 October; 1 November
USSR: 1 November

167. C. R. Wilson and M. Sugiura
HYDROMAGNETIC WAVES GENERATED BY THE JULY 9, 1962 NUCLEAR
WEAPONS TEST AS OBSERVED AT COLLEGE, ALASKA
J. Geophys. Res. 68, 3149-53 (1963).

USA: 9 July

168. R. H. Woodward and G. J. Gassmann
PHASE ANOMALIES OBSERVED IN VERY LOW FREQUENCY PROPAGATION
DURING NUCLEAR TEST OF JULY 9, 1962
"Propagation of Radio Waves at Frequencies below 300 kc/s"
(Proc. of Seventh Meeting of AGARD Ionospheric Research
Committee, Munich, 17-21 September 1962). Macmillan, 1964.
Chapter 21, pp. 321-33.

USA: 9 July

169. A. J. Zmuda, B. W. Shaw, and C. R. Haave
VERY LOW FREQUENCY DISTURBANCES AND THE HIGH-ALTITUDE
NUCLEAR EXPLOSION OF JULY 9, 1962
J. Geophys. Res. 68, 745-58 (1963).

USA: 9 July

170. A. J. Zmuda, B. W. Shaw, and C. R. Haave
VLF DISTURBANCES CAUSED BY THE NUCLEAR DETONATION OF
OCTOBER 26, 1962
J. Geophys. Res. 68, 4105-14 (1963).

USA: 26 October

171. A. J. Zmuda, B. W. Shaw, and C. R. Haave

VLF DISTURBANCES CAUSED BY TRAPPED BETA-RAYS FROM THE
DECAY OF NEUTRONS PRODUCED IN HIGH-ALTITUDE NUCLEAR
EXPLOSIONS

J. Research Natl. Bur. Standards, Radio Science 68D,
117-23 (1964).

USA: 20 October; 26 October; 1 November

APPENDIX

The following papers, given at the 44th Annual Meeting of the American Geophysical Union (Washington, D. C., 17-20 April 1963) are concerned with the high-altitude nuclear explosions of 1962. Abstracts are printed in the Transactions of the American Geophysical Union, Vol. 44, No. 1 (March 1963). Since many of these papers have not been published, a list of titles is included here, together with the pages on which the abstracts (if any) appear.

- o -

1. W. Brown: TRAPPED PARTICLE POPULATION FROM TELSTAR AND EXPLORER 15 OBSERVATIONS (Paper P37, No abs.)
2. B. Clark and D. A. Adams: ION CHAMBER OBSERVATIONS OF TRAPPED ELECTRONS (Paper P47, p. 77)
3. S. A. Colgate and R. G. D'Arcy: THE PHENOMENOLOGY OF THE MASS MOTION OF A HIGH-ALTITUDE NUCLEAR EXPLOSION (Paper P36, p. 76)
4. R. Fillz, E. Holeman, and H. Yagoda: VARIATION OF THE DIRECTIONAL FLUX OF SLOW TRAPPED PROTONS (Paper P49, p. 78)
5. R. Giacconi, F. R. Paolini, and L. Katz: MEASUREMENT OF TRAPPED PARTICLES INJECTED BY NUCLEAR DETONATIONS (Paper P46, p. 77)
6. W. N. Hess: INJECTION AND LOSS PROBLEMS (Paper P41, No abs.)
7. L. Katz and D. Smart: RECENT CHANGES IN THE ARTIFICIAL RADIATION BELTS (Paper P45, p. 77)
8. R. Kaufmann and T. M. Johnson: SYNCHROTRON RADIATION FROM THE ARTIFICIAL RADIATION BELT (Paper P53, p. 78)
9. J. F. Kenney and H. R. Willard: IONOSPHERIC EFFECTS OF HIGH-ALTITUDE NUCLEAR DETONATIONS (Paper P70, p. 81)
10. S. Mat shita: GEOMAGNETIC VARIATIONS ASSOCIATED WITH THE NUCLEAR EXPLOSION OF JULY 9, 1962 (Paper GA44, p. 41)
11. I. B. McDiarmid, D. C. Rose, J. R. Burrows and E. H. Budzinski: SATELLITE OBSERVATIONS OF ARTIFICIAL RADIATION ZONES IN OCTOBER 1962 (Paper P44, p. 77)
12. C. McIlwain: TRAPPED ELECTRON-PROTON INTENSITY AS FUNCTIONS OF ENERGY, B, L, AND TIME (Paper P38, No abs.)

APPENDIX, Continued

13. M. P. Nakada: STUDY OF SYNCHROTRON RADIATION FROM THE ARTIFICIAL RADIATION BELT (Paper P52, p. 78)
14. C. D. Schrader, R. C. Keifer, J. A. Waggoner, J. H. Zenger, and S. D. Bloom: OSO-1 OBSERVATION OF STARFISH ELECTRONS (Paper P42, p. 77)
15. R. Smith: ELECTRON FLUX MEASUREMENTS FROM DOD SATELLITES DURING THE PERIOD JULY TO NOVEMBER 1962 (Paper P39, No abs.)
16. D. W. Swift: RESULTS OF RIOMETER MEASUREMENTS AT ROCKPORT, MASSACHUSETTS, DURING THE HIGH-ALTITUDE NUCLEAR EXPLOSION ON JULY 9, 1962 (Paper GA19, p. 36)
17. J. A. Van Allen: ABSOLUTE INTENSITY, SPATIAL DISTRIBUTION, AND TIME DECAY OF INTENSITIES OF ARTIFICIALLY INJECTED ELECTRONS BASED ON OBSERVATIONS WITH INJUN I, EXPLORER 14, INJUN 3, AND DOD SATELLITES (Paper P40, No abs.)
18. M. Walt, G. E. Crane, and W. M. MacDonald: ANALYSIS OF ATMOSPHERIC SCATTERING LOSS RATES FOR GEOMAGNETICALLY TRAPPED ELECTRONS (Paper P50, p. 78)
19. J. A. Welch, Jr., and R. Kaufmann: TRAPPED ELECTRON TIME HISTORIES FOR $L = 1.18$ TO $L = 1.30$ (Paper P51, p. 78)
20. H. I. West, Jr., L. G. Mann, and S. D. Bloom: SPECTRA AND FLUXES OF ELECTRON TRAPPED IN THE EARTH'S MAGNETIC FIELD FOLLOWING RECENT HIGH-ALTITUDE NUCLEAR BURSTS (Paper P48, p. 77)
21. R. S. White, S. C. Freden, J. D. Mihalov, F. S. Mozer, and G. A. Paulikas: THE ARTIFICIAL RADIATION BELTS AT LOW ALTITUDES (Paper P43, p. 77)
22. A. J. Zmuda, B. W. Shaw, and C. R. Haave: VLF DISTURBANCES CAUSED BY THE NUCLEAR DETONATION OF OCTOBER 26, 1962 (Paper GA22, p. 36-7)