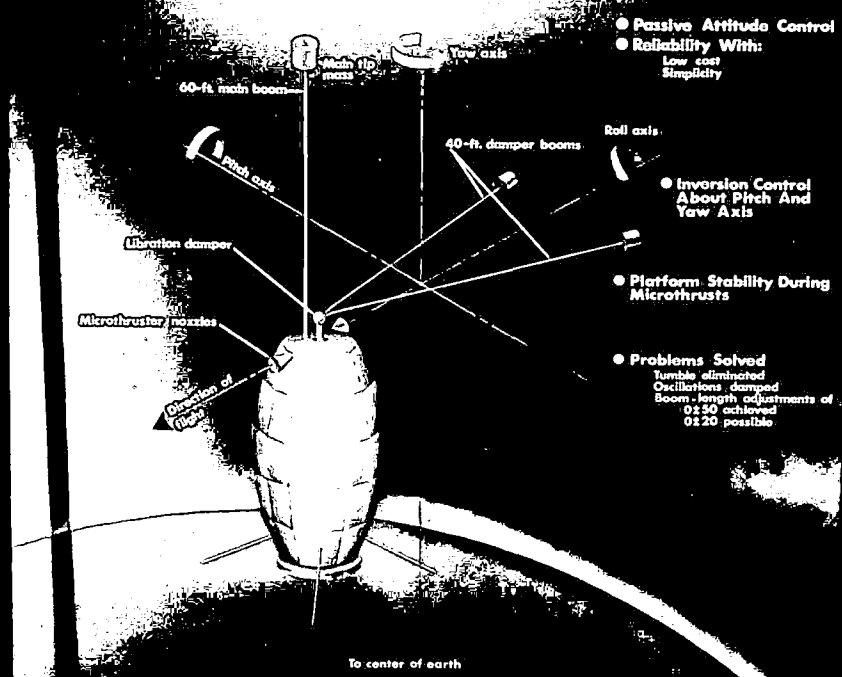


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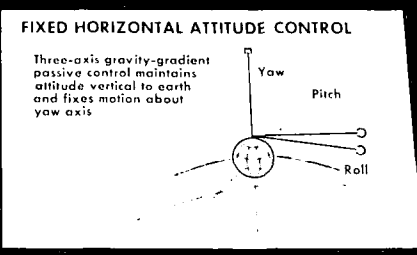
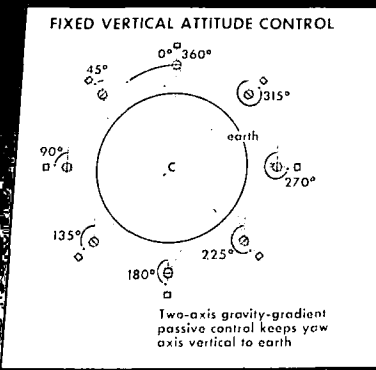
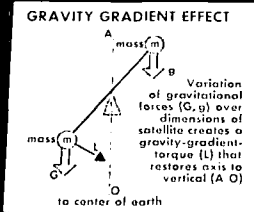
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GRAVITY GRADIENT TECHNIQUES



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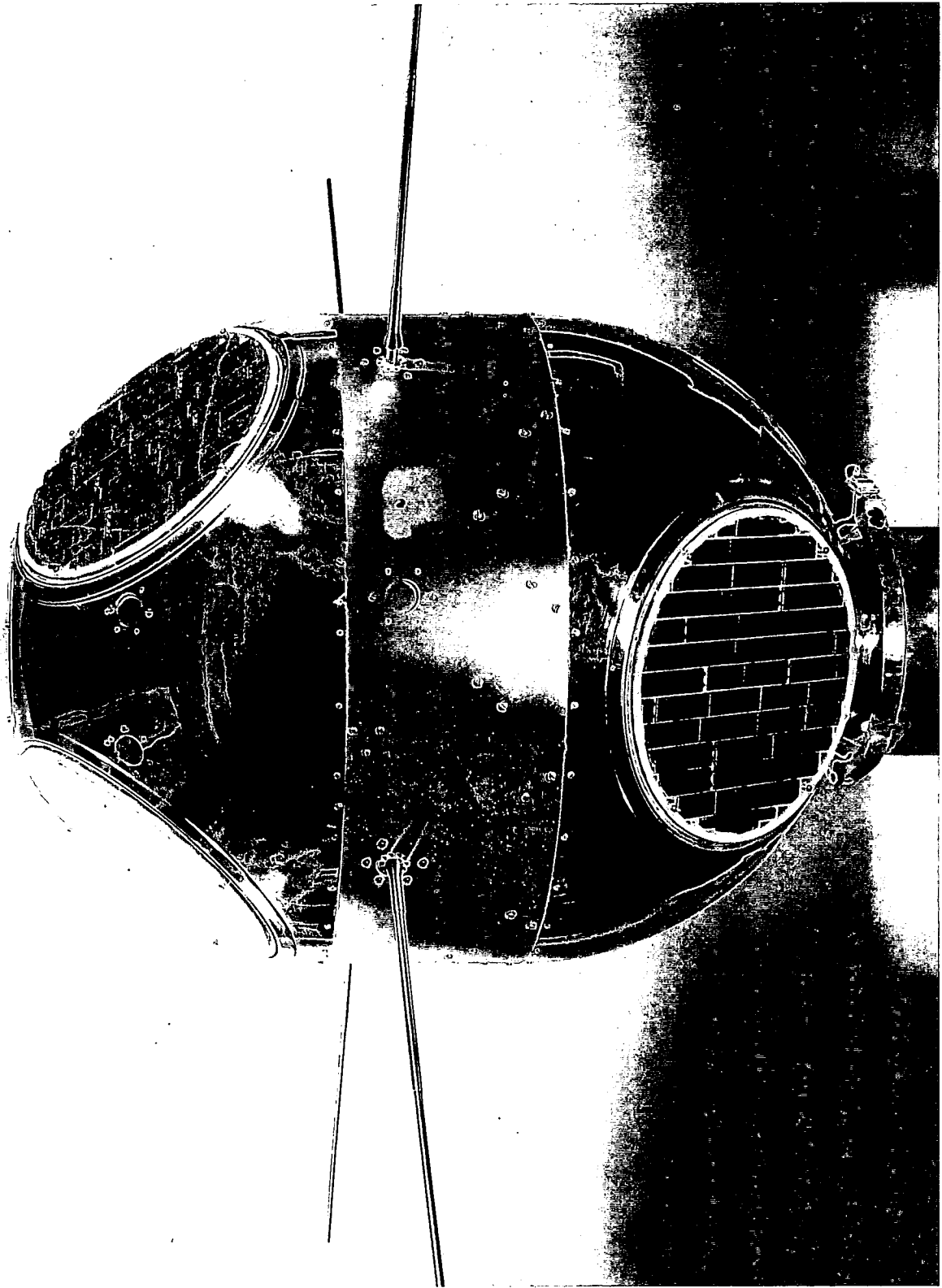


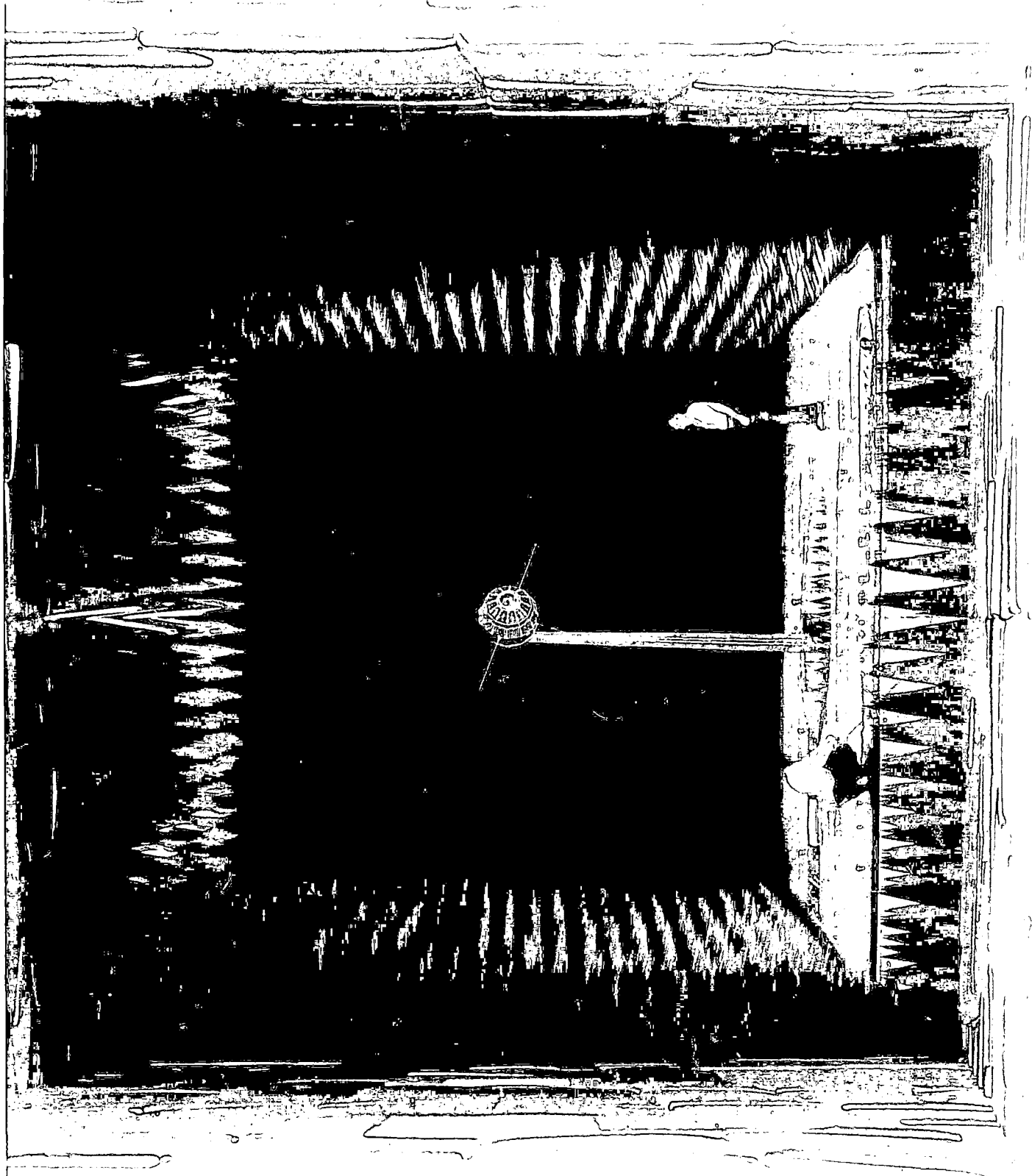
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NRL LABSTRACTS

No. 15

NAVAL RESEARCH LABORATORY, WASHINGTON, D.C.

April 14, 1967



New Director of Research

Dr. Alan Berman, 42, has been appointed to succeed Dr. R. M. Page as the Laboratory's new Director of Research. He will assume his new duties in the latter part of June of this year. Dr. Berman is presently the Director of Hudson Laboratories at Columbia University. His research specialties include the areas of underwater acoustics, oceanography, and signal processing.

Dr. Berman, a native of Brooklyn, New York, attended Columbia College, where he received the A.B. degree (1947), and Columbia University, where he received the Ph.D. degree (1952). He has been working at Hudson Laboratories since he received his doctorate degree, first as a research scientist, later as Assistant Director, and then Associate Director. He became Director of the Laboratories in 1963. Dr. Berman has also been a visiting scientist at the Admiralty Research Laboratory, Teddington, England, and at the Saclant ASW Research Center, La Spezia, Italy.

Dr. Berman is a member or chairman of twelve oceanographic advisory committees and boards,

including the ONR-NAVOCEANO Advisory Board for SQS-26 Survey. He has published approximately 40 papers in both classified and unclassified literature.

Dr. Berman is married, has five children, and is presently making his home in Dobbs Ferry, New York. It is expected that he and his family will be moving to the Washington area in late May or early June.

Congratulations

Congratulations are in order for Gilbert Michael, son of USRD's S&F Officer, James C. Michael, who won first place in the Seminole County Science Fair. Gil will receive a trophy and a \$50.00 Savings Bond for his entry, which describes the effects that different light conditions have on plants. In addition to this recognition, Gil will receive a free trip to Miami, where his project will be in competition in the State of Florida Science Fair.

Best wishes are extended to Gil for success in the State Fair and a rewarding future in his scientific endeavors.

Mark Your Calendar Now

Mark the date, Sunday, June 18, on your calendar now. That's the date the Boston Red Sox will play the Washington Senators in the 5th Annual Benefit Baseball Game for Children's Hospital. More information will be coming along later in April about the D.C. Stadium event, but note the date now so you can plan to attend.

Daylight Saving Time

The Naval District Washington Headquarters will go on daylight saving time at 2:00 a.m. April 30.

Closing for Inventory

The Public Works Self-Service Supply Center (No. 340) in Building 67 will be closed for inventory on April 29. On May 1, the Photographic Supply and Equipment Unit in Building 72N will be closed for the same purpose.

All Divisions are requested to plan their requirements so that withdrawals from the Centers on the dates above will not be necessary. Emergency issues will be made only on request of Division heads.

Please!

Once again we hear a cry of complaint from an employee needing to use a copying machine. Confidently she started her journey, and when she arrived at the machine, she also sighted another employee who was using it and who had a stack of thick volumes beside him. "Ah well," she sighed, "it won't be too long." Twenty minutes or so dragged by, and our patient employee was joined by two or three other employees who wanted to use the machine. Still the first employee copied on. Finally, after half an hour of waiting, our employee became weary and gave up hope. "I'll come back later," she told herself.

The point of this story is to remind all employees that they should comply with regulations established for the use of copying machines. These regulations are posted near the machines and in full view of all those who use them. Please, employees, read the rules, and if you do have a lot of work to be copied, be courteous enough to allow other people who need fewer copies to use the machine. This would save much valuable time for them and a great deal of money for the Government.

Problem in SE Asia Gets a Quick Response from NRL

In April 1966, the Naval Ordnance System Command requested the Surface Chemistry Branch, Chemistry Division, to see if it could devise a means for improving the maintenance of small arms weapons used by UDT/SEAL personnel in Southeast Asia. Corrosion of the weapons by salt was a particular problem, and considerable rusting was noted in the bore, chamber, and on moving parts after the weapons had been fired.

The Branch replied that two solutions were available. One method involved the application of a coating of Teflon, but this could only be done during manufacture of the weapon. The second method involved applying a preservative-lubricant to all metal parts of the weapon. This preservative treatment, developed by Messrs. Robert N. Bolster and Hayward R. Baker, of the Surface Chemistry Branch,

can be used at any time whether the gun is wet or dry, during an operation, or behind the lines. The decision was to follow the preservative-lubricant approach. Less than two months later, the material, in aerosol cans, was delivered to NAVORDSYSCOM for initial fleet evaluation in SE Asia.

In a letter to the Director praising the work of the Branch and Mr. V. G. FitzSimmons, who did valuable outside liaison work with the gun manufacturer and the Navy, the Commander of NAVORDSYSCOM, RAdm A. R. Gralla, stated that tests have proven that the NRL developed material is far superior to other standard military and commercial materials, and that the NRL preservative-lubricant is now a stated requirement with a significant follow on resupply for forces in Vietnam.

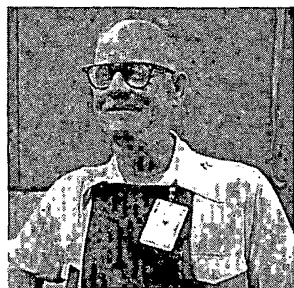
RAdm Gralla said in part, "As a result, the operability and maintainability of UDT/SEAL weapons

has improved measurably. This development is considered to be a significant contribution to UDT/SEAL readiness, and reflects great credit on NRL's responsiveness to urgent requirements as well as the individual commendatory efforts of Dr. C. Singleterry and Mr. V. G. FitzSimmons at NRL."

Navy Seals

SEAL teams are Navy units trained in conducting unconventional or paramilitary operations and are capable of training personnel of Allied nations in such operations. The name SEAL, is derived from the words, Sea, Air, and Land. SEALS compare with the U.S. Army's Special Forces or the Air Force's Commandos, and can be classified as a combination "frogman," paratrooper, and commando. The first SEAL units were commissioned in 1962, and currently there are over 100 SEALS assigned to the Pacific Fleet.

A Visit With



Albert S. Briggs

Engineering Services Division; Machinist; NRL for 15 years, Gov't for 27 years; served his apprenticeship in Ohio 37 years ago; previously worked for DTMB and the Gun Factory; he enjoys horseback riding and at one time had 20 horses, now rides at a dude ranch in Pa., he also golfs and bowls (his best bowling score is 257); he's originally from Youngstown, Ohio; he and his wife, Dorothy, now reside in Arlington,



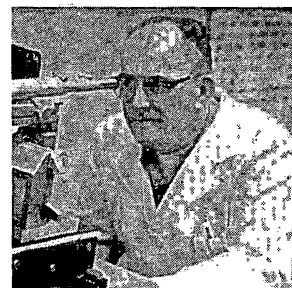
Virginia L. Mason

Office of the Comptroller; Accounting Technician; she's been with the Government and the Laboratory since 1947; she and her husband, Charles, have a son and a daughter-in-law; she enjoys bowling (her best score is 146) and traveling (she's visited Canada and Florida); dislikes men drivers; she's originally from Washington, D.C., where she attended Roosevelt High School; she now lives in Bethesda, Maryland.



Conrad H. Cbeek

Ocean Sciences and Engineering Division; Acting Head, Chemical Oceanography Branch; he's been at the Laboratory since 1953, began Government service in 1948 as a student aid at the Bureau of Commerce; graduated from Howard University in 1949 and received his Ph.D. from Washington University, St. Louis; he and his wife, Billie, have 4 sons and 2 daughters; enjoys golf and hifi (he's built his components); originally from Weldon, N.C.; now lives in Washington, D.C.



Owen B. Laing

Electronics Division; Physical Science Technician in the Research Devices Facility; he's been at the Laboratory since 1963 and in Government service since 1936; he came to the Laboratory from NASA and had worked at the Weapons Plant for 25 years; he and his wife, Mary, have a daughter; enjoys golfing, bowling, and playing bridge in his spare time; dislikes bridge and coffee grippers; he and his wife are originally from D.C.; they are now residents of Suitland, Maryland.

Chief of Staff, Italian Navy, Visits Laboratory

NRRC 5-9



Adm Michelagnoli and Capt Owen

Admiral Alessandro Michelagnoli, Chief of Staff, Italian Navy, and former Head of Italian Naval Research, visited the Laboratory on March 22. The Admiral and his party were on an orientation and familiarization tour of U.S. Navy Laboratories. Adm Michelagnoli received a general Laboratory briefing by the Director, Capt T. B. Owen, who also presented him with an NRL plaque as a memento of his visit. The group later heard discussions on

Four-Day Memorial Weekend Expo '67 Tour

The Oxon Hill Travel Club, a non-profit organization, is sponsoring a 4-day, 3-night, Expo '67 tour which features 2 days in Montreal, round-trip transportation (bus), 3 nights lodgings, 2 Expo '67 Passports, sightseeing tour of Montreal, boat ride on Lake Champlain, a buffet dinner, Fort Ticonderoga or Ausable Chasm tour, and professional tour guide.

The tour leaves on May 27th at 6:30 a.m. and arrives back in Washington on May 30 at approximately 10:30 p.m.

Prices range from \$84.00 to \$72.00 per person. A deposit of \$25.00 per person (not refundable) will hold your reservation until May 3.

For further information contact Mrs. Nancy Biggs, 5214 Birchwood Drive, Oxon Hill, Maryland 20021 (Birchwood City), or telephone LO7-0040.

"Space Surveillance," by Mr. R. L. Easton, Applications Research Division; "Submarine Habitability," by Mr. V. R. Piatt, Chemistry Division; and "Deep Ocean Technology," by Mr. C. L. Buchanan, Ocean Sciences and Engineering Division.

Members of Admiral Michelagnoli's party were his personal Aide LCdr Nicola Sarto; RAdm Guiseppi Cosulich, Director of Naval Intelligence; Capt Arrigo Barbi, Naval Attache', Washington; Cdr Vittorio Palermo, Assistant Naval Attache', Washington. They were accompanied by Capt T. J. LaForest, USN, Escort Officer, and Capt W. R. Hunnicut, Jr., Director of ONR Military Services Division.

"Mathematics Today" Film

The "Mathematics Today" film for April 19 and 21 is, "Challenge in the Classroom; The Methods of R. L. Moore" (55 minutes). It will be shown in the Auditorium of Building 28 at 11:00 a.m.

A documentary film that includes classroom scenes and an outdoor discussion with Professor R. A. Rosenbaum in which he describes the beginnings of his own mathematical education in 1897. Direct statements by Professor Moore illuminate his unusual and extremely successful instructional system, which has produced an unparalleled number of distinguished mathematicians. This film can be followed without specific mathematical knowledge, but it requires first courses in calculus and topology for complete understanding.

Reminder

The fourth and final session for the 1966-1967 season of Seminars for Teachers of Science and Mathematics will be presented on Saturday morning at 9:00 a.m., April 22, and repeated the following Monday evening at 7:30 p.m., April 24.

Dr. Rex Neihof, Protective Chemistry Branch, will discuss the physico-chemical properties of the bacterial cell wall in a talk titled, "To Skin a Microbe." This is the first approach to life science ever attempted in this series of "Milestones in Science and Engineering."

Both sessions will be held in the Demonstration Hall of Building A-50, best entered from the Bellevue gate. Laboratory employees are invited to attend and can obtain reservations by calling Mrs. Malarky, on Ext. 858.

Quarterly Drill Schedule

All Laboratory personnel are cordially invited to attend the series of training lectures planned by Naval Reserve Research Company 5-9 for the fourth quarter of FY 1967. All meetings are held in the auditorium of Building 28 at 4:35 p.m. except for the June 16 meeting, which starts at 3:35 p.m. Division Administrative Assistants are requested to furnish Code 1570 with a list of persons who desire to attend the classified meetings.

Date Major Topic and Speaker

Date	Major Topic and Speaker
April 21	"Aircraft Identification-AIMS Project-PM8," by Capt Norman D. Champ-lin, Project Manager, Naval Material Command (Confidential).
May 5	"Deep Submergence Systems Project-PM11," by Dr. John P. Craven, Project Manager, Naval Material Command (Confidential).
May 19	"All-Weather Carrier Landing System Project-PM6," by Capt F. R. Fearnow, Project Manager, Naval Material Command (Confidential).
June 2	"OMEGA Navigation System Project-PM9," by Capt Mavis X. Polk, Project Manager, Naval Material Command (Confidential).
June 16	"Fast Deployment Logistic Ship Project-PM 10," by RAdm Nathan Sonenshein, Project Manager, Naval Material Command (Confidential).

New Faces: Welcome Aboard!



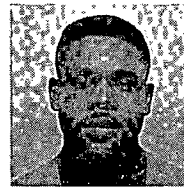
Frank A. Milillo
Operations Res. Analyst
Off. Dir. Research



Alta M. Miller
Clerk Typist
Technical Information



Veronica W. Misiur
Clerk Typist
Public Works



James E. Penn
Laborer
Public Works



Louis Polsky
Mechanical Engineering
Engineering Services



Virgil Provenzano
Physicist
Applications Research



Leroy R. Stoddard
Laborer
Public Works



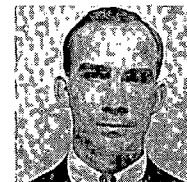
Michael M. Valente
Machinist
Engineering Services



William L. Weinreich
Electronics Technician
OSED



David M. Weiss
Mathematician
Atmos. & Astro.



Daniel S. Woodson, III
Physicist
Electronic Warfare

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- Power supply, Power Designs 501JS, 50 v @ 1.5 amp.
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- Amplifier, wide band H.P. 461A, 1 kc to 150 Mc.

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- Report immediately to the Dispensary, Building 72, to obtain first aid between the hours of 8:00 a.m. and 4:00 p.m. If you are injured at other times call the OOD, Ext. 523, for ambulance service.
- Report every illness or injury sustained in the performance of duty to your immediate supervisor without delay.
- Secure names and addresses from others who were present at the time of the injury or onset of an occupational illness.
- Complete Form CA-1 (Employee's Notice of Injury or Occupational Disease) at the Safety Office, Building 50, Room 129, immediately after treatment, if possible.

• If any loss of pay is involved, Form CA-4 (Claim for Compensation on Account of Injury) will be completed by the Safety Office.

• Additional information on your rights and responsibilities under the Federal Employee's Compensation Act is available from the Safety Branch, in Building 50, Room 129.

Security Reminder

Preliminary drafts, carbon sheets, carbon paper typewriter ribbons (one time), plates, stencils, stenographic notes, worksheets, and all similar items containing classified information shall be either:

(1) destroyed by the person responsible for their preparation immediately after they have served their purposes, or

(2) shall be given the same classification and safeguarded in the same manner as the classified material produced from them.

New typewriter ribbons used in the preparation of classified material shall either be typed over until illegible or given the same classification and safeguarded in the same manner as the classified material prepared from them.

LABSTRACTS is an official Laboratory medium for communicating with employees about topics of general interest and for publishing news about their work and achievements. It is a weekly publication distributed on Friday. Short notices and announcements should be submitted to the Technical Information Division, Code 2040 (Ext. 2702), by Friday for inclusion in LABSTRACTS one week later. Longer articles should be allowed a two-week lead time.

NRL LABSTRACTS

No. 18

NAVAL RESEARCH LABORATORY, WASHINGTON, D.C.

May 5, 1967

Dr. Shapiro Receives DCSA



Dr. Shapiro's three children, Joel, Elana, and Raquel, were there when Dr. Frosch (right) presented him with the DCSA. Story on page 3.

New Superintendent - Electronic Warfare Division

Mr. Howard O. Lorenzen has been appointed Superintendent of the Electronic Warfare Division, which was established on September 12, 1966, when the Radio Division was reorganized. The effective date of the appointment has been made retroactive to February 3.

Mr. Lorenzen joined the Laboratory in July 1940 as a Contract Radio Engineer after working for the Zenith Radio Corporation, in Chicago. He became Head of the Countermeasures Branch, Radio Division, in 1949, and later was appointed Acting Superintendent of the Electronic Warfare Division when it was formed.

A native of Atlantic, Iowa, Mr. Lorenzen received his B.S.E.E. (1935) from Iowa State College. He subsequently did graduate study in mathematics at the University of Buffalo and communications at Northwestern University.

During his career at the Laboratory, Mr. Lorenzen has served as Chairman of the Joint Signal Evaluation and Analysis Subpanel

of the Joint Chiefs of Staff, as a member of the Joint Electronic Warfare Panel, and Consultant to the Canukus Electronic Warfare



Panel and the Joint Electronic Intelligence Panel and its subgroups. He is presently Chairman of the Advanced Technical Objectives Working Group for Electronic Warfare, recently established by Dr. Johnson, Director of Navy Laboratories. He is also a member of the Institute of Electrical and Elec-

Open House

The Naval Ship Research and Development Center (formerly David Taylor Model Basin and Marine Engineering Laboratory) at Carderock, Maryland, will have an Open House on Saturday, May 13, from 10:00 a.m. to 4:30 p.m. You, your family, friends, and associates are cordially invited to attend.

Visitors will have an opportunity to see the Harold E. Saunders Maneuvering and Seakeeping Facilities—the largest “instant ocean” in the world; the underwater-explosion test pond; and tests in towing tanks, wind tunnels, and water tunnels. Snack bar service and picnic area will be available.

U.S. Savings Bond Campaign

The 1967 U.S. Savings Bond Campaign is now underway. It began on May 1 and will continue until June 2. For the first time, employees who participate in the Payroll Savings Plan at NRL or the Bond-A-Month Plan at the bank may purchase the new “Freedom Shares,” which pay a handsome interest rate of 4.74 percent when held to maturity of 4 1/2 years.

tronic Engineers, the American Physical Society, and the American Radio League.

Mr. Lorenzen has received both the Navy's Meritorious and Distinguished Civilian Service Awards. He holds patents on UHF radio circuitry and IF radio circuitry and is credited with the development of the popular Zenith TransOceanic Universal model portable radio.

Mr. Lorenzen and his wife, Etta Mae, have one daughter, Susan Ann, who is presently employed as a Librarian in the Bellevue, Washington, public school system.

"Mathematics Today" Film 14 Ride on an Air Cushion

The "Mathematics Today" film for May 10 and 12 is "Differential Topology: Lecture II" (60 minutes). It will be shown in the Auditorium, Building 28, at 11:00 a.m.

In "Differential Topology: Lecture II" manifold (with boundary) is defined for the piecewise-linear and "topological" categories. The Poincare conjecture is discussed in detail from each of the four viewpoints, as is the problem of characterizing the n -disk. The J.H.C. Whitehead theory of C_1 -triangulations is introduced, and the notion of tangent bundle, which plays a fundamental role in the topology of smooth manifolds is discussed.



On April 10, fourteen members of the Laboratory staff took a ride on the Potomac aboard an air-cushioned vehicle. The vehicle, manufactured by Bell Aerosystems Company, had been in D.C. demonstrating its capabilities over river and swamps, or what the Navy calls "marginal terrain." Among the 14 who boarded at Bolling AFB for a thrilling half-hour ride were Capt R. M. Davis, Chief Staff Officer, and members of the Naval Analysis Staff, Radar Division, and Chemistry Division. They were shown the vehicle's relationship to amphibious operations.

Wanted - Ten Pin Bowlers

Anyone interested in joining the NRL summer league that bowls at the Ten Pin Coliseum, please call Stew Slawson on Ext. 671 or 673.

A Visit With



Robert W. Chrisp

Sound Division; Electronic Engineer; with the Government and the Laboratory since 1956; attended VPI as co-op student, received his B.S.E.E. in 1959; spent two years in the Army at Ft. Bliss and Florida; enjoys waterskiing (particularly on Lake Hamilton, Ark.), tennis, and cooking (specialty is barbecue); dislikes tailgaters on the Beltway; from Little Rock, he now lives in Arlington, Va.



Evelyn P. Pryor

Security and Administrative Services; Records Classifier; she's been with NRL since 1951 and in the Gov't since 1945; she has 2 boys and a girl; a basketball fan, she enjoys music (plays the piano at church), teaches Sunday school, loves children and spends all of her spare time working with them; dislikes cold weather; originally from Asheville, N.C., now resides in the District.



Charles W. Mader

Engineering Services Division; Model Maker (Sheetmetal); in November he will have 22 years of service at NRL; spent 4 years in the Navy; he and his wife, Colleen, have two daughters; he's a Mason, works with youth organizations, such as Job's Daughters and Oxon Hill Majorettes, of which his youngest daughter is a member; dislikes D.C. weather; he's from Johnstown, Pa., now lives in Forest Heights.



Napoleon Jones

Applications Research Division; Electronic Engineer in the Operational Research Branch; he's been with the Laboratory since June, 1959; he graduated from North Carolina College in 1958 with a B.S. in physics; he and his wife, Beverly, have one son; he enjoys photography and foreign languages and is an avid football fan; born in Merritt, North Carolina, now lives in Lanham, Maryland.

Dr. Shapiro - Continued

Dr. Maurice M. Shapiro, Chief Scientist of the Laboratory for Cosmic Ray Physics, received the Navy's Distinguished Civilian Service Award (DCSA) on April 25. As Dr. Shapiro's three children looked on, Dr. Robert A. Frösch, Assistant Secretary of the Navy (R&D), pinned on the medal and read the citation in behalf of Secretary of the Navy Paul H. Nitze.

Dr. Shapiro's citation reads: "As a gifted scientist dedicated to the advancement of science and to his country, Dr. Shapiro has received world-wide recognition for his contributions to physics. His scientific leadership and his investigations in cosmic radiation, elementary-particle physics, and nuclear physics have led to significant advances in these fields. By virtue of his pioneering applications of nuclear emulsion methods to high-energy physics, and the achievements resulting therefrom, he is richly deserving of the Navy's Distinguished Civilian Service Award."

Among the guests at the ceremony were Capt T.B. Owen, Director; Dr. W. C. Hall, Acting Director of Research; Capt J. C. Matheson, Director of Support Services, and Mrs. Matheson; Dr. Peter King, Chief Scientist, ONR; Dr. Kaj Strand, Technical Director, U.S. Naval Observatory; Dr. Scott Forbush, Carnegie Institution, Washington, an eminent cosmic-ray physicist who discovered the Forbush decreases that led to our understanding of solar modulation of the galactic radiation; Mr. Arthur D. Holzman, Assistant General Counsel, NASA; Dr. Alan Berman, Director, Hudson Laboratories; Dr. Herbert Friedman, Chief Scientist of the E. O. Hulburt Center; Dr. Richard Tousey, Head of the Rocket Spectroscopy Branch, Atmosphere and Astrophysics Division, who, like Dr. Friedman, is a member of the National Academy of Sciences; and Dr. James Schulman, Acting Associate Director of Research for General Sciences.

Last year NRL established a Chair of Cosmic Ray Physics to "confer special recognition on Dr. Shapiro as a distinguished scientist of exceptional accomplishment."

He had served since 1953 as Superintendent of the Nucleonics Division; in 1965 he resigned from that position to concentrate on astrophysical research.

Most of Dr. Shapiro's professional career has been devoted to fundamental investigations in cosmic-ray astrophysics and in nuclear physics. He has also made contributions to applied physics, e.g., on the effects of fission explosions in water (he collaborated with the late John Von Neumann in theoretical studies of the underwater explosion of nuclear bombs for the Los Alamos Scientific Laboratory in 1945-46); and the design of a novel type of nuclear reactor for ships (low-enrichment fission reactors, at NRL in 1949).

Throughout his career, Dr. Shapiro has been concerned with the impact of science and technology on society. When the Federation of Atomic Scientists was formed at the end of World War II, he served (in 1946) as Chairman of the Association of Los Alamos Scientists, which fought successfully for civilian control of atomic energy.

Subsequently, at Oak Ridge, he was Chairman of the Association of Oak Ridge Engineers and Scientists. In his early years in Washington, Dr. Shapiro served on the National Executive Committee of the Federation of American Scientists. In those days, the Federation was a potent catalytic agent in the campaign to establish a National Science Foundation.

Dr. Shapiro's awards include a Manhattan District Award (1946) and a Guggenheim Fellowship (1962), which he elected to spend as Visiting Professor of Physics at the Weizmann Institute of Science, Rehovoth, Israel. He has served as Chairman of the U.S. International Geophysical Year National Committee on Interdisciplinary Research and is a former President of the Philosophical Society of Washington. In addition, Dr. Shapiro is a Fellow of the American Physical Society, the Washington Academy of Sciences, and the American Association for the Advancement of Science, and a member of the Italian Physical Society, the Scientific Research

Society of America, and the Washington Association of Scientists. He has authored more than 100 scientific publications and reports.

In accepting the DCSA award, Dr. Shapiro acknowledged the essential support and encouragement he had received at NRL for many years from Dr. W. C. Hall, Acting Director of Research. He praised the vital contributions of his associates in the Laboratory for Cosmic Ray Physics, particularly those of Bertram Stiller, Nathan Seeman, Frances W. O'Dell, and Rein Silberberg. He also thanked Dr. John McElhinney, whose "generous help" as Associate Superintendent of the Nucleonics Division had enabled Dr. Shapiro to pursue his researches while administering the affairs of the Division.

Call for Papers

Annual National Conference on Environmental Effects on Aircraft and Propulsion System, September 25, 1967, Princeton, New Jersey. Deadline date: May 12, 1967 (A).

Annual Wire and Cable Symposium, November 29, 1967; Atlantic City, New Jersey. Deadline date: May 12, 1967 (A).

Symposium on Automatic Support Systems for Advanced Maintainability, November 7, 1967, Clayton, Missouri. Deadline date: May 15, 1967 (A).

Anachem Conference, October 3, 1967, Detroit, Michigan. Deadline date: May 15, 1967 (A).

Western Electronic Show and Convention, August 22, 1967, San Francisco, California. Deadline date: May 15, 1967 (A).

International Conference on II-VI Semiconducting Compounds, September 6, 1967, Providence, Rhode Island. Deadline date: May 15, 1967 (A).

The Electrochemical Society, Fall Meeting, October 8, 1967, Chicago, Illinois. Deadline date: May 15, 1967 (A).

International Symposium on Microscopy (Micro-67), August 21, Cambridge, England. Deadline date: May 21, 1967 (A,#).

Footnote

(A) Abstracts or summaries required

(#) Date given is approximate or tentative.

New Faces: Welcome Aboard!



Warren H. Hame, Jr.
Student Trainee
OSED



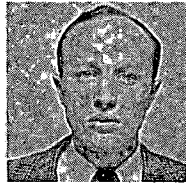
Rosanne C. Hoss
Clerk-Typist
Off. Director



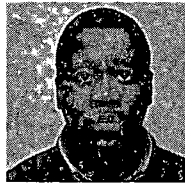
Allen K. Kinhead
Machinist
Engineering Services



Robert L. Kinzer
Research Physicist
Cosmic Ray Physics



William A. Kupeman
Physicist
Sound



James Mackey, Jr.
Laborer
Public Works



Charles W. Martz
Electronics Technician
OSED



Philip J. Moser
Student Trainee
Atmos. and Astro.



Gerald E. Nash
Mechanical Engineer
Metallurgy



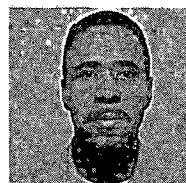
Vito T. Navarro
Electronics Technician
Engineering Services



Joseph P. O'Dea
Guard
Sec. and Admin. Serv.



Shirley L. Page
Clerk Typist
Radio



Richard C. Roberts
Warehouseman
Supply



William L. Tenda
Machinist
Engineering Services



Judy A. Thompson
Clerk Typist
Off. Director

Free Amusements in Washington

Fort Washington Tours are conducted on Saturdays, Sundays, and holidays at 2 and 4 p.m., from May 13 until October 15. Fort Washington, a 341-acre fortification, is located on the Potomac River 6 miles south of Washington. Participants in the tours should meet at the drawbridge entrance, where there is also a museum. The park, open daily from 7:30 a.m. to dark, may be reached via Maryland Route 210 (Indian Head Highway). Turn right onto Fort Washington Road about 4-1/2 miles below the Capital Beltway (I-495) and continue 4 miles to the park entrance.

Exploring and Photographing the Sky. Members of the National Capital Astronomers bring their telescopes to Rock Creek Park and conduct "guided tours" of the heavens. On cloudy or rainy evenings, illustrated talks on astronomy are given in the Rock Creek Nature Center. Astronomy outings are held at Picnic Grove 16, west of the Nature Center. "Tours" are conducted on Saturdays—May 13, at 9 p.m.; June 17, 9 p.m.; July 15, 9 p.m.; July 29, 9 p.m.; August 12, 9 p.m.; September 2, 8:30 p.m.; and September 30, 8:00 p.m. If you wish to take telescopic pictures, bring your cameras loaded with film of A.S.A. speed 200 or higher. Bring your pictures to future programs to show and compare.

Carillon Concerts are given at the Netherlands Carillon, south of the U.S. Marine Corps War Memorial in Arlington. Free concerts by guest carillonneurs are given holidays and Sundays at 3 p.m. until September 24.

NRL and the IRS Get Together

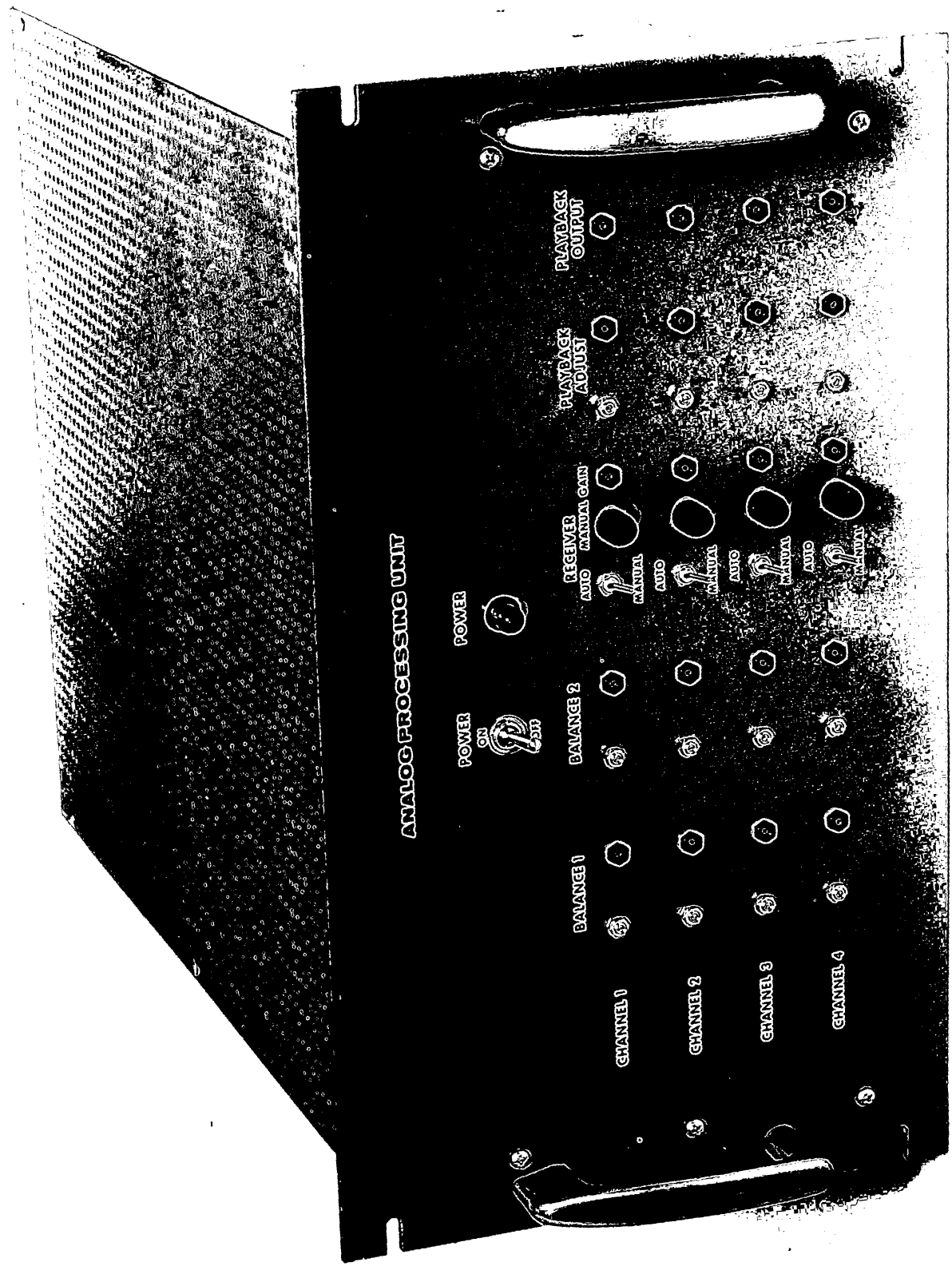
NRL and the IRS got together to link three South Carolina men who were thought to be involved in a conspiracy to sell 300 tons of machine gun parts illegally. The linking was done by means of neutron activation analysis of dirt samples found in cans containing the gun parts and dirt found in a barn many miles away.

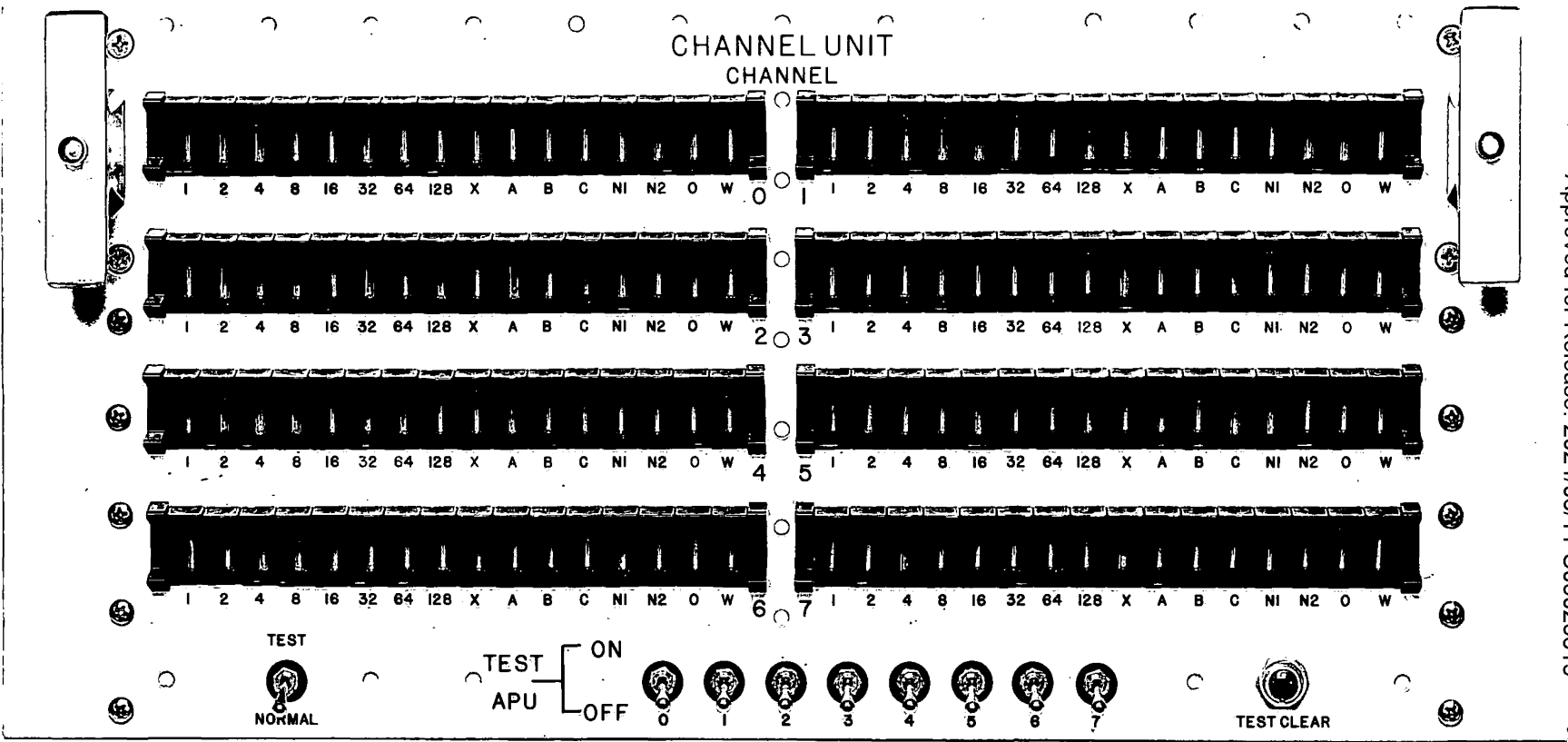
Mr. C. Michael Hoffman, an Internal Revenue Service chemist, used NRL's research reactor to make each sample radioactive and then measured the emissions.

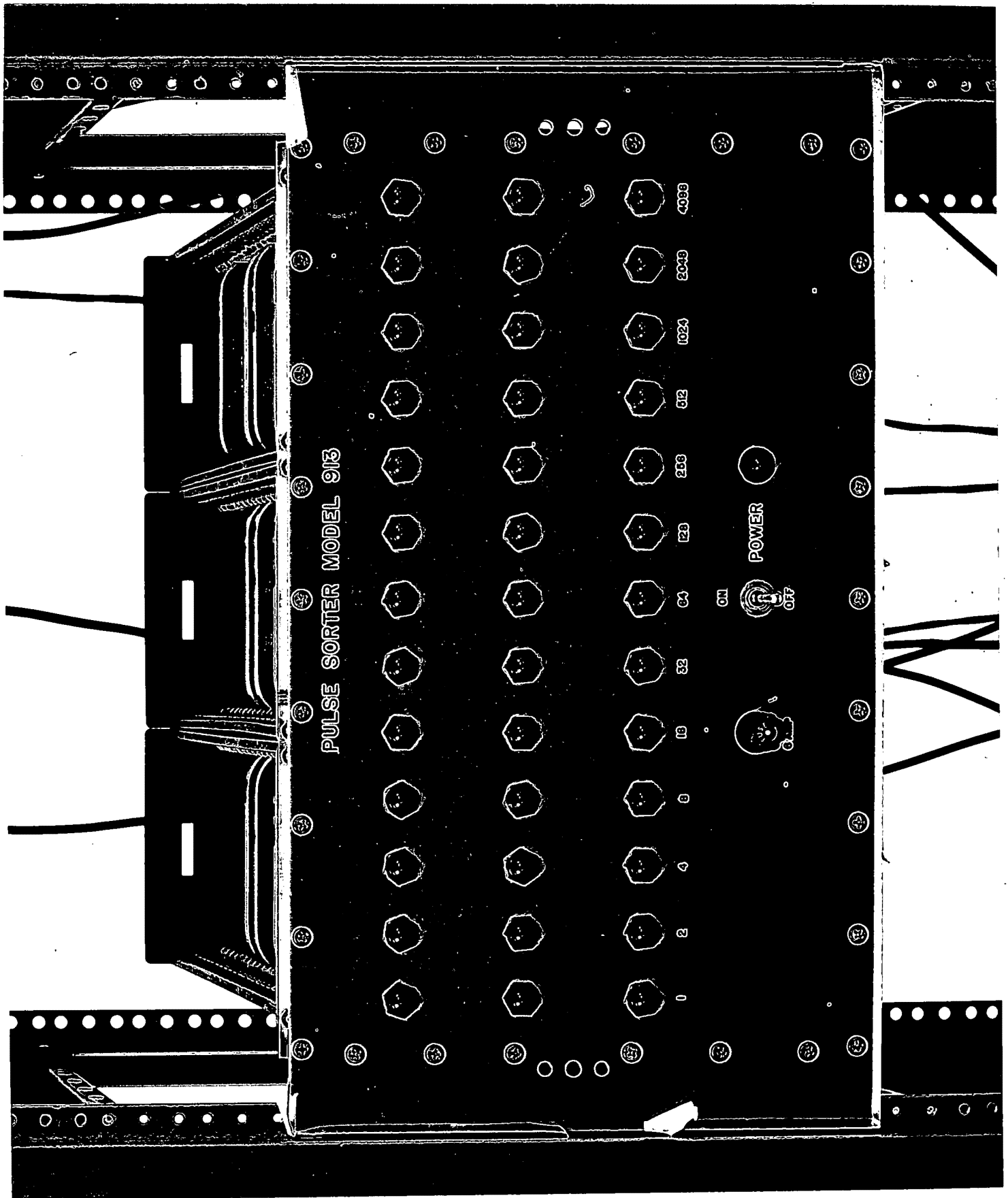
Soils from different locations emit different kinds of radiation, but the two samples gave off the same type of radiation. Mr. Hoffman and the IRS concluded that the two samples were identical. Partly on the basis of Mr. Hoffman's testimony in court the three men were found guilty and sentenced.

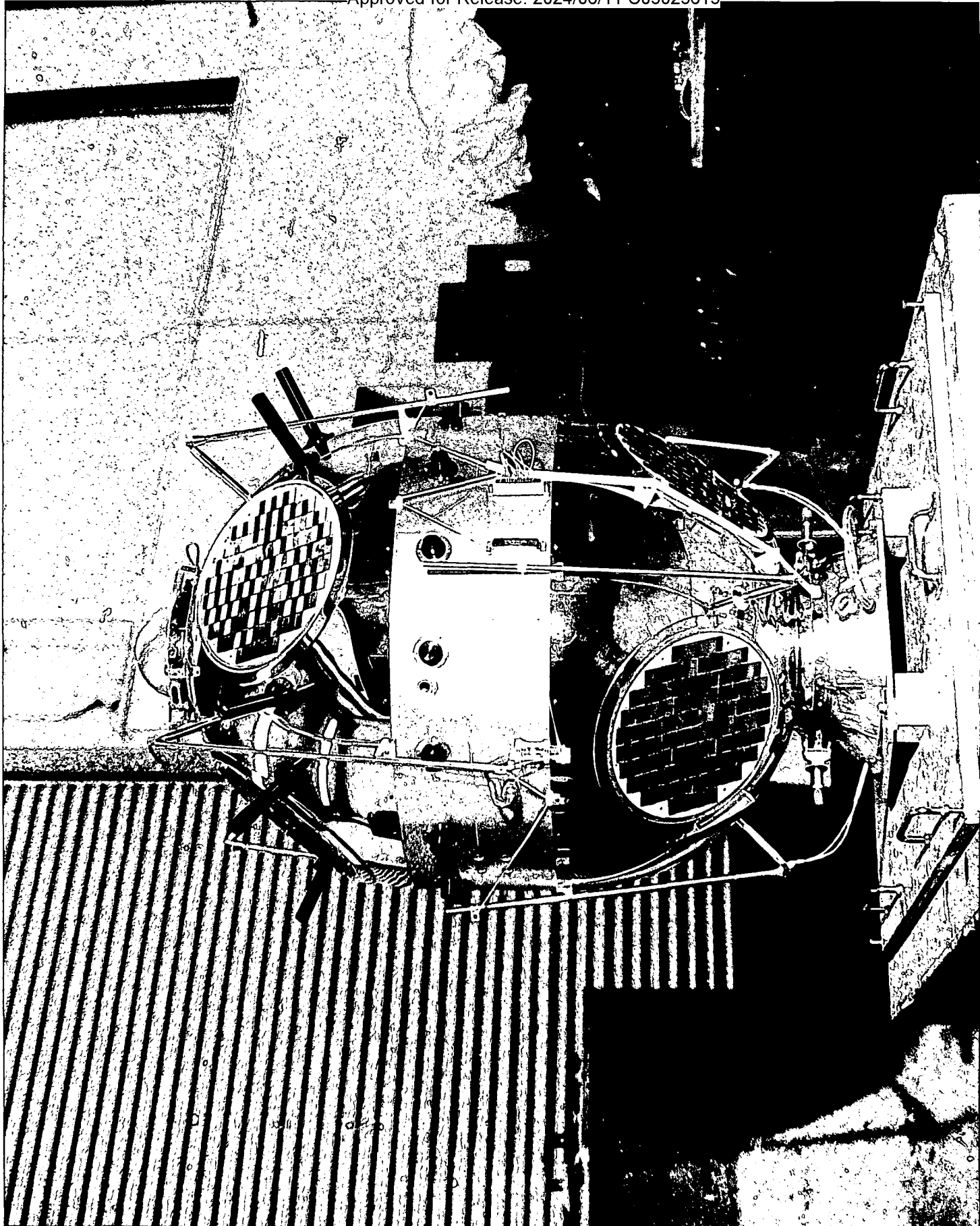
Four other non-Navy agencies are presently using the Laboratory's research reactor; they are the FBI, Post Office, the Food and Drug Administration, and the U.S. Geological Survey.

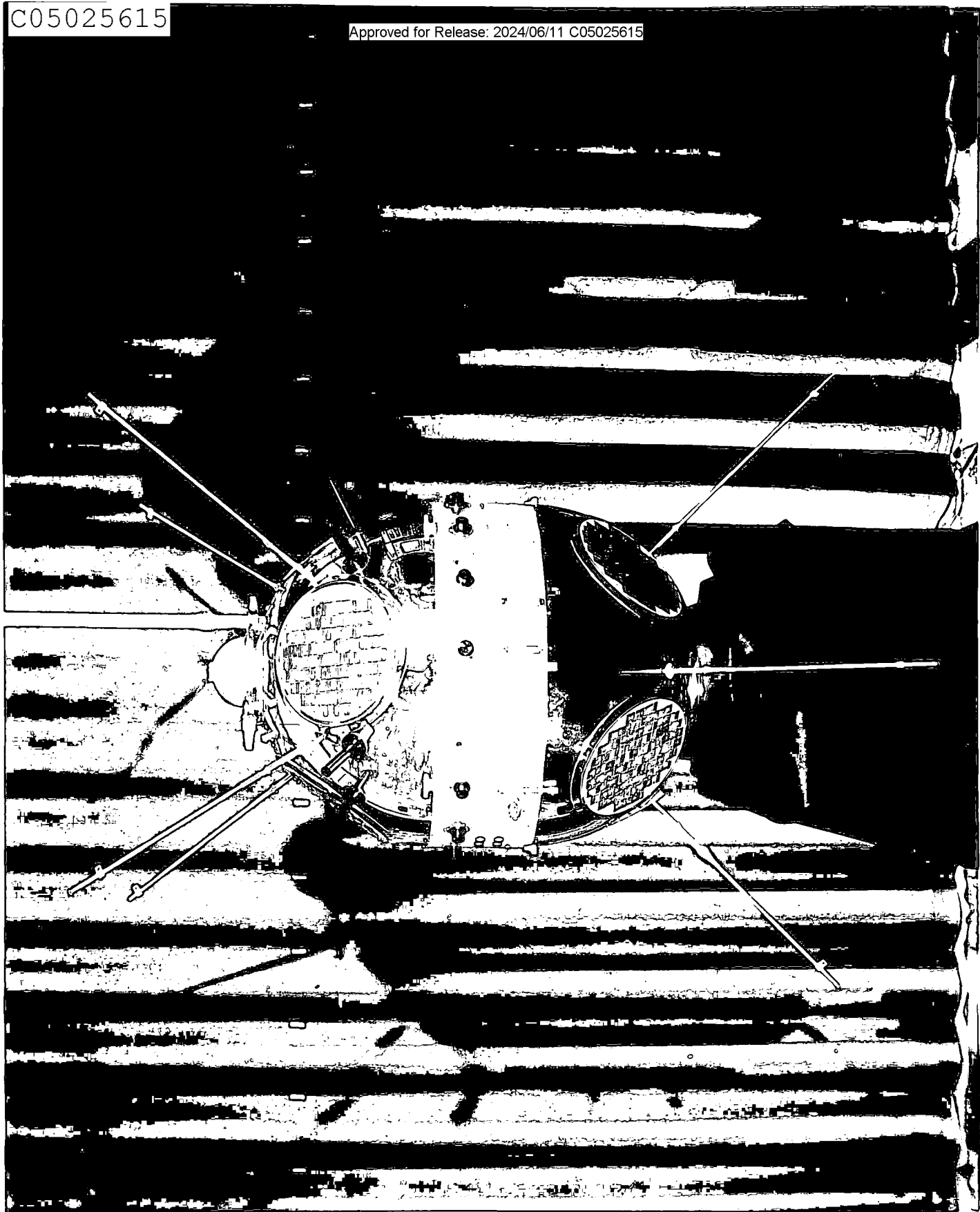
LABSTRACTS is an official Laboratory medium for communicating with employees about topics of general interest and for publishing news about their work and achievements. It is a weekly publication distributed on Friday. Short notices and announcements should be submitted to the Technical Information Division, Code 2040 (Ext. 2702), by Friday for inclusion in LABSTRACTS one week later. Longer articles should be allowed a two-week lead time.

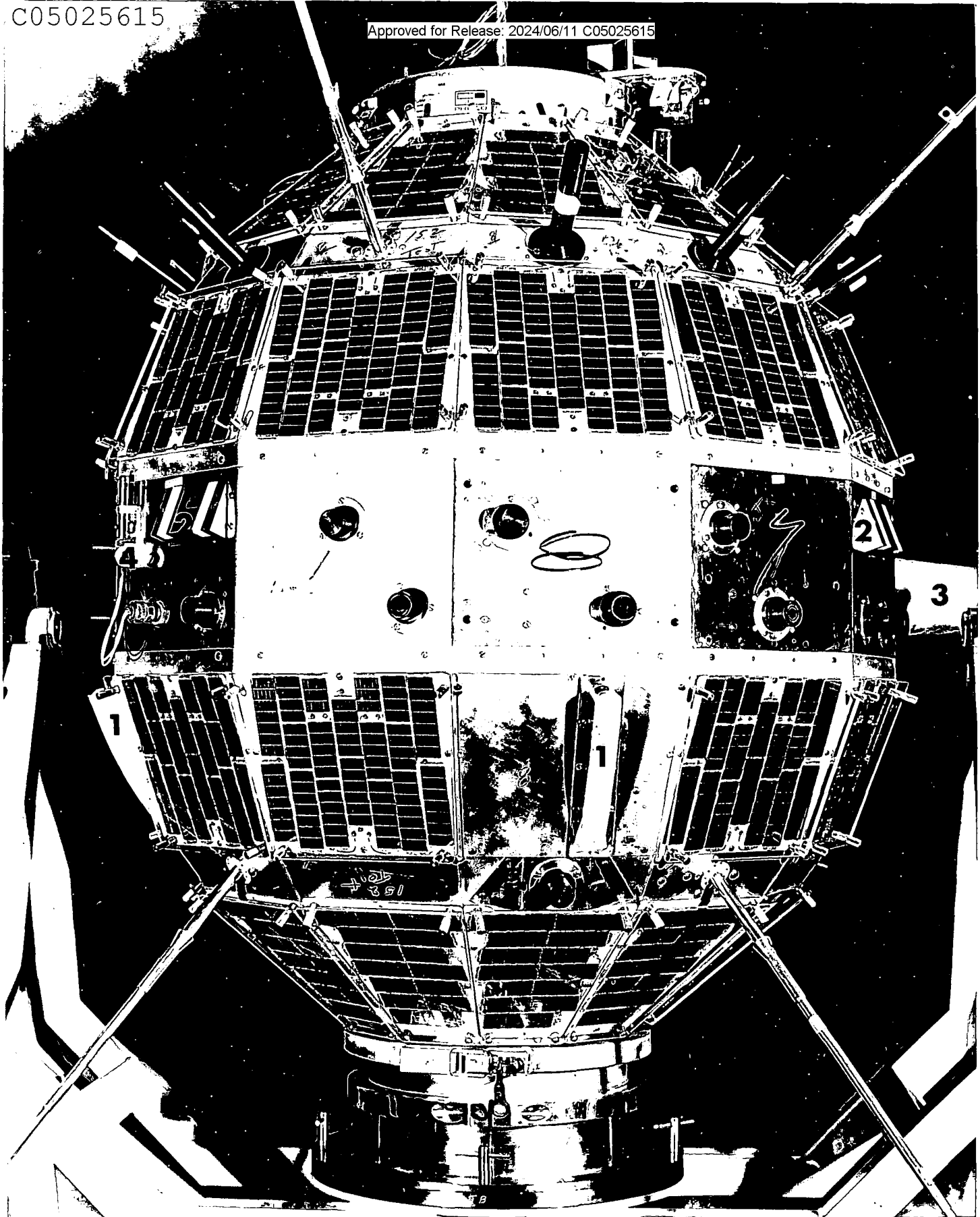




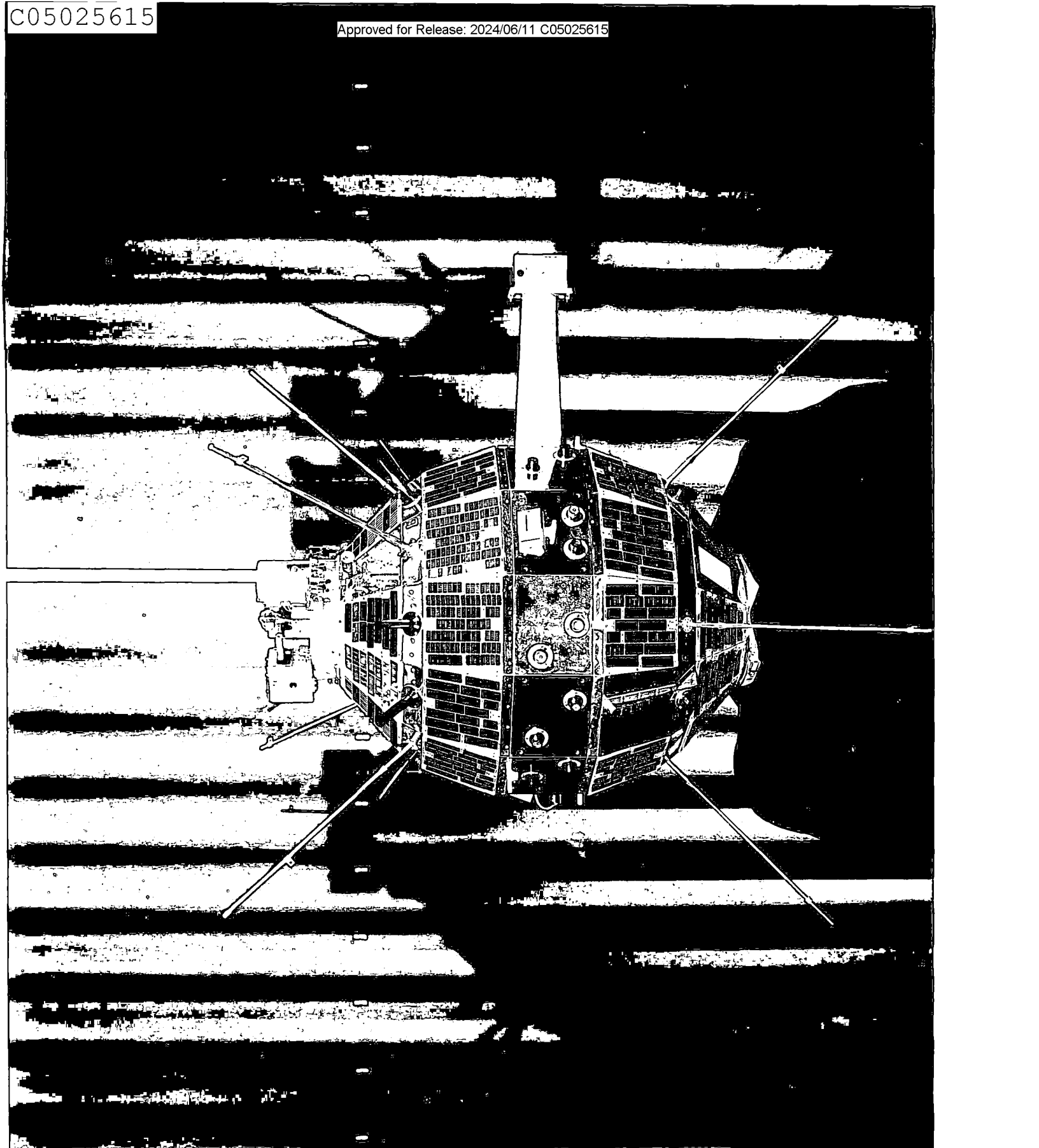








7105R



GGSE-4
LAUNCHED 31 MAY 1967 . . 187 LBS.

GGSE-4 IS ONE OF A SERIES OF NRL SATELLITES THAT EMPLOY DEVELOPMENTAL THREE-AXIS GRAVITY STABILIZATION SYSTEMS. THIS THREE-AXIS SYSTEM NOT ONLY ALIGNS ONE OF THE SATELLITE'S AXIS ALONG THE VERTICAL, BUT ALSO PROVIDES CONTROL OF THE "THIRD" AXIS OR YAW AXIS OF THE SPACECRAFT. GGSE-4 IS ONE OF FOUR NRL SATELLITES LAUNCHED IN MAY OF 1967 THAT HAVE CONTINUOUSLY TRANSMITTED USEFUL DATA FOR A PERIOD OVER FIVE YEARS. BECAUSE OF THE ASYMMETRIES INTRODUCED BY THE ADDITIONAL BOOMS ON GGSE-4, GYROSCOPIC TORQUES ARE DEVELOPED AS THE SATELLITE ROTATES IN INERTIAL SPACE AT A RATE OF ONE REVOLUTION PER ORBIT. THESE TORQUES CAUSE THE AXIS OF MAXIMUM MOMENT OF INERTIA TO ALIGN ITSELF PERPENDICULAR TO THE PLANE OF THE ORBIT, THUS PROVIDING CONTROL OF THE YAW AXIS.

TIMATION-1**(TIME-NAVIGATION)****85 LBS.****LAUNCHED 31 MAY 1967****A NEW, PASSIVE SATELLITE NAV-****IGATION SYSTEM WAS PLACED INTO ORBIT TO TEST COMPONENT****PERFORMANCE AND VERIFY THE PRINCIPLES OF A NEW, PASSIVE SATELLITE NAV-****IGATION TECHNIQUE THAT WOULD PERMIT SHIPS AND AIRCRAFT TO OBTAIN A****HIGHLY ACCURATE, INSTANTANEOUS POSITION FIX.****THIS PROPOSED NRL SYSTEM WOULD UTILIZE SEVERAL SATELLITES THAT****WOULD TRANSMIT SIGNALS AT VERY PRECISE KNOWN INTERVALS OF THE UHF SIG-****NALS FROM AT LEAST TWO OF THE SATELLITES (AT KNOWN POSITIONS), CONVERT****THE TRANSMISSION-TO-RECEIPT TIME INTO DISTANCE, AND THEN APPLY STAND-****ARD NAVIGATION TECHNIQUES TO DETERMINE POSITION.**

