MELPAR-A-GRAPH

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MELPAR WINS $1.9 MILLION ELINT STUDY

FUTURE SCIENTISTS REPORT . . . . on their progress with the research projects they pursued in the Research Division under the sponsorship of the Joint Board on Science Education and the National Science Foundation. Above, Melvin Boozer (seated) explains work he is doing with the Mass Spectrograph to Mrs. M. H. Maury, Associate Director of the Program and left to right: Dr. P. E. Ritt, Vice President-Research, with students J.S. Smith, J.R. Murphy, and M. Losoncsky. (See story page 2) Photo by Glittenberg

President E. M. Bostick announced the receipt of a contract from the U.S. Army Electronics Materiel Agency, Fort Monmouth Procurement Office, Fort Monmouth, New Jersey for a feasibility study of a Forward Area Electronic Intelligence subsystem. The contract also calls for the design and development of experimental models operating in one of the subsystem's frequency bands. The subsystem will be used for electromagnetic reconnaisance. Dollar amount of the contract is approximately $1.9 million.

(EDITOR'S NOTE: Announcement of this award came as we went to press. Assignment of the contract to Dr. E. B. Carne's newly formed Intelligence Department will be reported on in more detail in the next issue.)

MELPAR TO BUILD BEACON ANTENNA SYSTEM FOR APOLLO

Melpar has been selected to build a research and development beacon antenna system for the National Aeronautics and Space Administration's Apollo spacecraft.

Dollar value of the work is being negotiated. Melpar was named for the job by North American Aviation's Space and Information Systems Division, Downey, California, Principal Contractor on the spacecraft for NASA Manned Spacecraft Center, Houston, Texas.

The Melpar system will be used in early Apollo Program research and development vehicles. It will provide for the transmission of beacon signals for ground tracking purposes during early unmanned flights of the Apollo. The Apollo spacecraft will transport the first Americans to the moon for lunar exploration before 1970.

MELPAR RECEIVES $439,788 CONTRACT FROM NAVY

The Bureau of Weapons' Naval Ordnance Laboratory at White Oak, Maryland has awarded a $439,788 contract to Melpar for fabrication and engineering assistance in the development of a proximity fuze according to President E. M. Bostick.

Engineering design and development for the two year program will be under the direction of Mr. L. L. Bonham. The fabrication portion of the program will be performed by the Manufacturing Division under Mr. L. C. Wright.

Research and development for this contract has been assigned to Principal Engineer P. L. Bachman according to Mr. P. E. Taylor, Manager of the Antenna Laboratory.

SOLION RESEARCH CONTINUES UNDER NEW NAVY CONTRACT

Melpar has been awarded a $57,521.29 contract by the Bureau of Naval Weapons to perform research and development leading to an improvement in sensitivity and a decrease in response-time of the solion accelerometer. The new award is an out-growth of a contract awarded last year to investigate solion devices as a new approach to accelerometer applications in guidance systems.

Based on the conductivity of ions, and capable of converting mechanical energy into electrical energy, the solion is still a relatively new type of electrolytic device. Solion cells can be constructed to be sensitive to a variety of stimuli, namely acoustic vibration, acceleration, and electromagnetic radiation. Multiple cells can be constructed to function as: dc amplifiers, to take logarithms, powers, roots, derivatives and products of electrical outputs; and to perform integrations. The variety of outputs is largely controlled by the geometry of the electrodes in the cell.

Active in solion research since 1957, the Research Division's current solion investigations are under the direction of Dr. R. T. Foley, Electro-Chemistry Branch Supervisor.

MELPAR PARTICIPATES IN SUMMER RESEARCH PROGRAM FOR H.S. STUDENTS

Melpar participated again this year in the Summer Science Research Participation Program for High-Ability Secondary School Students which is sponsored by the Joint Board on Science Education of the Washington Academy of Sciences and the District of Columbia Council of Engineering and Architectural Societies. The program is also supported by a grant from the National Science Foundation.

Four area high school students who had been selected for participation in the program by the Joint Board on Science Education spent their summer in the Research Division's laboratories. Each boy selected a research problem which he pursued under the direction of a Melpar scientist. In addition to using the Company Library to search the literature on their problem, each boy learned to use the special equipment and research tools provided in the laboratories. Mrs. Margaret H. Maury, Associate Director of the program, paid weekly visits to monitor the progress of the students participating in the program at Melpar.

Under the tutelage of Dr. W. E. Mitchell, James S. Smith tackled a problem involving the vapor deposition of single crystal materials. With guidance from Mr. E. G. Bylander, Jay R. Murphy selected a problem involving thin film diodes. Melvin Boozer, with Mr. Julian Chaudet as his mentor, worked on a problem involving mass spectroscopy and infrared spectroscopy. With direction from Dr. H. E. Podall, Miklos Losoncsky took a research project involving the synthesis of organic compounds. All of the Melpar scientists who worked with the boys were impressed with their breadth of knowledge and their ability to grasp new information.

DR. SCHMIDT LECTURES AT FAA EXECUTIVE SCHOOL

Dr. L. A. Schmidt, Director of Management Controls, was guest lecturer at the Federal Aviation Agency's Executive School in Charlottesville, Virginia on Tuesday, 18 September. Dr. Schmidt's topic for this lecture was "The Controls of Management."

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BIONICS RESEARCH CONTINUES WITH AWARD OF NEW FUNDS

Additional funding of two Bionics contracts by the Electronic Technology Laboratory, Air Force Systems Command, totals $188,361.00 according to President E. M. Bostick. The new funding provides for research on the two contracts for an additional year under the direction of Mr. K. C. Streeter, Manager of the Computer Department. Total funding on these contracts to date now amounts to $371,989.00.

Contract AF 33(616)-7834 is concerned with building proof-of-principle models to demonstrate the concept of machine intelligence. A model of a maze runner which learns to run a maze under the direction of ten decision elements was delivered early in 1962. It shows in a striking manner the practical possibilities of machine intelligence. Work is presently concentrated on the design and development of a large learning network containing 1,024 decision elements. With this unit it should be possible to simulate a number of the more elementary biological functions of simple creatures. It is theorized that this machine contains a sufficient number of decision elements to allow simulation of all functions of an earthworm.

Research on contract AF 33(616)-7682 has developed a concept of an electronic representation of an artificial neuron and has shown the application of information theory and conditional probabilities to the general theory of this device. A breadboard of a two-input, one-output learning network was delivered late in 1961. Work is presently continuing on the refinement of the system concepts, the development of more generalized learning components, and development of larger, more complex learning systems which are under the control of multiple goal criteria. In the follow-on, as well as in the original contract, learning networks are simulated on a computer which is located at the Shirley Highway Plant.

Both contracts are under the supervision of Project Engineer W. H. Fuhr.

MELPAR ACQUIRES NEW SUBSIDIARY

Melpar has announced the acquisition of a majority of the stock of Microwave Physics Corporation, recently established to design and manufacture microwave components and subsystems. Founders of the new company are Mr. C. Lavon Linker, President, Dr. L. A. Blackwell, Vice President for Research and Development and Mr. J. W. Maxwell, Vice President for Engineering and Manufacturing.

Mr. Edward M. Bostick, Melpar President, said the subsidiary will not duplicate Melpar's activities but will mainly provide microwave components required by companies engaged in both commercial and military electronics.

Directors of the corporation are Mr. Bostick, Mr. A. C. Weid, Melpar Executive Vice President, Mr. R. S. Butts, Technical Assistant to Mr. Bostick, and Mr. Linker and Dr. Blackwell of MPC.

The new subsidiary represents another step in Melpar's program to expand and diversify its capabilities, Mr. Bostick said.

Joseph Farago
1904-1962

Joseph Farago will not celebrate h[is] 16th anniversary with Melpar in Octobe[r]. He died of a heart attack on Friday, August 24th at his home.

Joe was one of Melpar's "beginners." He was our second oldest employee in years of service and was loved by all who knew him for his cheerful disposition and his willingness to lend a helping hand whenever and wherever needed. He frequently contributed the catalytic influence that made solution of a knotty technical problem possible. Joe's devotion to electronics and his extraordinary perseverance was a constant source of inspiration to younger engineers. His special knack for making things work made him the envy of all his colleagues.

Though Joe will be sorely missed by all who knew him, the influence of his sense of engineering adventure and his practical approach to problems will continue to be reflected in the achievements of all who were privileged to work with him.

PERSONNEL-VEHICULAR DISCRIMINATOR TO BE DEVELOPED BY RESEARCH DIV.

The U.S. Army Ordnance District, Philadelphia has awarded a design study and development contract to Melpar for a personnel-vehicular discriminator to include the development and fabrication of a number of prototypes as well as testing and evaluation. Under a second contract the Philadelphia Ordnance District is sponsoring another research program to include design, fabrication and testing of a personnel sensor. Funding for the two contracts totals $93,182.

The contracts have been assigned to the Research Division. The research and development is being performed by Branch Supervisor J. Wallen, Jr., in K. J. Stetten's Advanced Dectection Section.

PROFILES OF RADAR DEPT. LAB MANAGERS

Julian Caballero — Manager of the Countermeasures Laboratory, has been with Melpar since 1953, and is presently responsible for all Melpar research and development work in electronic countermeasures equipment.


Mr. Julian Caballero

Mr. Caballero, for the past three years, has been associated with the development effort on such countermeasures systems as: AN/SLQ-7; ULR-12; ALQ-43; ALQ-42; ALQ-38; and ULT-2. Since his promotion to Countermeasures Laboratory Head he has directed the development of an advanced ECM receiver; and the QRC-187(T), a jammer employing new techniques.

Mr. Caballero has completed studies that involved the development of new concepts for broadband intercept receivers. He has also supervised the development of automatic jamming systems, which included the design of transmitters, modulators, r-f mixers and amplifiers, power supplies, and control mechanisms.

Because of his extensive experience with countermeasures equipment, Mr. Caballero is frequently in demand as a technical consultant by groups having ECM problems. Mr. Caballero is a member of I.R.E.

Franklin H. Jaynes — Manager of the Fuze Laboratory. Joining Melpar in 1952, Mr. Jaynes brought with him eight years of experience in electronics, including the design and evaluation of devices used to increase the speed and security of naval communications.


Mr. Franklin H. Jaynes

His early experience at Melpar was associated with the design and development of navigational equipment for aircraft, subminiature radar equipment, telemetering systems and servomechanisms. Subsequently, he was engaged in the design and development of radio, radar and capacitive fuzes for use in ground - to - air, air - to - ground, and ground-to-ground missiles. Recent experience has consisted of investigations of infra-red, ultra-violet, noise modulation and correlation techniques for use in active target detection and ranging systems.

KINDLEY PRESENTS PAPER TO AMERICAN CHEMICAL SOCIETY

A technical paper was presented before the Organic Chemistry Division of the National American Chemical Society Meeting by Mr. L. M. Kindley in September. The paper, entitled "Synthesis of Tris-(Hydroxy-methyl) Phosphine Oxide. Reaction with Lead Salts," was co-authored by Mr. Kindley, Dr. N. Filipescu, Dr. H. E. Podall, and Mr. F. A. Serafin.

The authors report on the development of a novel and convenient method for the preparation of tris-(hydroxy-ethyl) phosphine oxide (THPO) from tetrakis (hydroxymethyl) phosphonium chloride (THPC).

Mr. Jaynes has also been engaged in the comprehensive investigation, design development and evaluation of electronic systems, equipments, and techniques covering a diverse range of specialized fields. His experience has given him an extensive knowledge of the present state of advanced electronic technology. Mr. Jaynes is a member of the IRE Professional Group on Information Theory.

P. E. Taylor — Manager of the Antenna Laboratory, is engaged in the development of a fuze antenna for the U.S. Army Diamond Ordnance Fuze Lab.; an interference study on high-gain tracking systems; an antenna model techniques program; and the research, development, and construction of a beacon antenna system for the Apollo spacecraft.


Mr. P. E. Taylor

Mr. Taylor came to Melpar soon after graduation from college, and has worked on projects including development, improvement, and application of techniques for measuring the phase and amplitude in the near field of microwave lenses. He has also done research, design, and development in microwave lens systems for ground support equipment for antennas; development of antennas in the frequency range from UHF to EHF for ECM bomber systems; and the extension of highpower handling capabilities of spiral antennas. He has supervised investigation on a communication antenna system capable of surviving the extremely high overpressure region of a thermonuclear detonation and has recently completed a general hardened antenna study.

Mr. Taylor received his B.S.E. degree from Evansville College in 1957. He is the author of several technical articles including papers on hardened antennas, near field phase and amplitude measurements, ECM antennas, and spiral antennas. He is a member of IRE.

KLEIN APPOINTED MANAGER OF SPECIAL PRODUCTS DIVISION

The appointment of Mr. A. L. Klein as Manager of the Special Products Division was announced on 13 August by Executive Vice President A. C. Weid.


Mr. A. L. Klein

Prior to joining Melpar in October 1961 as Manager of Marketing for the Special Products Division, Mr. Klein was Vice President for Marketing of Pacific Electromagnetics in Palo Alto, California. His career also includes eight years with Ampex Corporation in various engineering, sales, marketing management and administrative positions; and seven years with the U.S. Navy in weather forecasting and meteorological instrumentation.

Mr. Klein graduated from the University of California in 1950 with a B.A. in Physics and received a Certificate in Business Management from the same university in 1960. He is a member of IRE, having served on the Instrumentation and Engineering Management Subgroups.

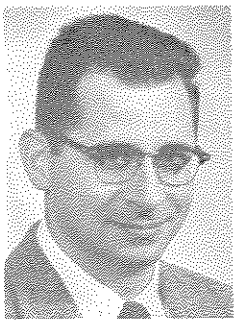
PODALL INVITED TO PRESENT PAPER TO CANADIAN SYMPOSIUM ON ORGANOMETALLIC COMPOUNDS

At the invitation of The University of British Columbia, Vancouver, Canada, Dr. H. E. Podall presented a paper entitled "Synthesis of Some Organometallic Compounds for Vapor Deposition Applications" at the Symposium on Organometallic Compounds sponsored by the University on 4-6 September. The paper was co-authored by Dr. Podall, Dr. M. M. Mitchell, Jr., and Dr. J. M. Shackleford.

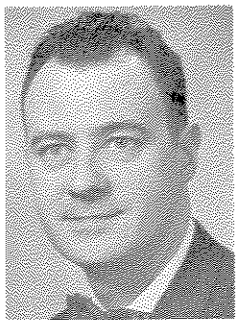
The paper discussed the applicability of various types of organometallic compounds for use in the deposition of thin films for molecular electronics applications and coatings for high temperature protective applications.

MELPAR SPEECH COMPRESSION EXPERTS PRESENT PAPERS AT STOCKHOLM COMMUNICATIONS SEMINAR

Mr. S. Joseph Campanella, Head of the Electroacoustics Section, and Principal Engineer David C. Coulter, pioneers in the field of speech compression, attended the International Speech Communications Seminar in Stockholm, a unique meeting of international experts who have made outstanding contributions to this rapidly developing technology. The seminar, sponsored by Sweden's Royal Institute of Technology, was held from August 29th to September 1st.



Mr. S. J. Campanella



Mr. D. C. Coulter

The two men have spearheaded Melpar's research effort in speech bandwidth compression since 1954. Their most recent contributions to speech communications advances were presented at the meeting in two papers titled "A Spectrographic Study of Formant Tracking," and "The Influence of Transmission Error on Formant Coded Compressed Speech Signals." After the meeting they visited the laboratories of speech compression experts in Stockholm and Christchurch, England, for a firsthand look at European developments in the field.

Ultimate applications of speech bandwidth compression systems toward which Melpar is working include automatic voice translating machines, automatic dictating machines, robots that will respond to spoken command and voice communications systems for deep space. Speech compression systems are promising for space communications because for a given amount of transmitted power they promise to project voice communications signals to much greater distances than conventional systems.

Speech compression systems convert the human voice into electronic signals which are reconverted into an electronic facsimile of the voice at the receiving end. The electronic "voice" is produced in a method similar to articulation by the human vocal cavity. It closely approximates the speech mannerisms and inflections of the speaker.

GOING UP!

Recent Promotions included J. P. Bartell to Test Supervisor, H. DeSchmertzing to Branch Supervisor, and J.F. Hasky to Chemical Engineer.

J. F. Healey moved up to Junior Specifications Engineer, W. F. Herblin to Senior Chemist, and V. R. Heubner to Branch Supervisor.

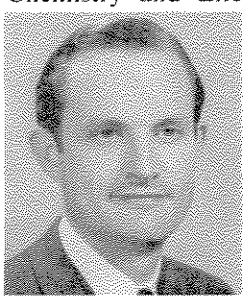
O. C. King advanced to Senior Field Electrical Engineer, P. J. McCabe to Branch Supervisor, and J. H. Meyer to Project Engineer.

J. W. Reid stepped up to Shop Foreman, M. E. Schwartz to Senior Electrical Engineer, and S. E. Seay to Quality Assurance Inspector.

R. R. Thibault was promoted to Test Engineer, W. A. Upchurch to Inspection Foreman, and G. C. Vieth to Project Engineer.

MACARTHUR PROMOTED TO MANAGER OF THE CHEMISTRY AND LIFE SCIENCES DEPARTMENT

Dr. D. M. MacArthur was promoted to Manager of the Chemistry and Life Sciences Department on August 27th according to Dr. P. E. Ritt, Vice President-Research.



Dr. D.M. MacArthur

Joining Melpar in 1958 as a Senior Chemist, Dr. MacArthur was promoted to Supervisor of the Chemistry Branch in February of 1960, to Section Head in May of 1960, and to Manager of the Chemistry and Biological Sciences Laboratory in August of 1961. He graduated from St. Andrews University, St. Andrews, Scotland in 1954 with a Bachelor of Science in Chemistry [Hons.]. After earning his Doctor of Philosophy in Physical Chemistry from the University of Edinburgh, Edinburgh, Scotland in 1957, he taught chemistry at the Univeristy of Connecticut.

Dr. MacArthur is a member of the Chemical Society of Great Britain, the American Chemical Society, the American Rocket Society, and the American Society for the Advancement of Science.

MELPAR PARTICIPATING IN FAA's OPERATION FLIP-FLOP

Recognizing that air traffic control lags technological advancement in air transportation by a significant margin, the Federal Aviation Agency recently initiated a program through which it is hoped that industry can propose and contribute solutions to this problem.

The program, called "Flip-Flop" was initiated in July with representatives of fourteen different companies, comprised in the main of those who had in the past produced equipment for FAA, attending a five week orientation. Dr. R. Wayne Masters, Systems Associate, participated in the FAA orientation as Melpar's representative.

The FAA orientation included a week of briefings by key FAA personnel on the new FAA organization, a three week "short-short course" in air traffic control at the FAA Academy in Oklahoma City, and a one week review at its National Aviation Facilities Experimental Center in Atlantic City, New Jersey.

According to Dr. Masters, one of the major problems facing FAA is that of improving the accuracy and efficiency of air traffic control so that more airplanes can be controlled safely with closer spacing in all airspace. The FAA would like to have extremely accurate altimeters, high speed automatic altitude reporting devices, automatic identification devices, higher precision radars, and dependable all-weather landing systems.

The name Flip-Flop implies that the program will be reciprocal in which industry will make presentations to the FAA in various fields such as production, research, engineering, management, etc., following the formal orientation given by FAA at its various facilities.

UNIV. OF COLORADO CONFERENCE HEARS FELDMAN REPORT ON THIN METAL FILMS

Dr. Charles Feldman presented a technical report at the 1962 Conference on Thin Films on August 23rd.

Dr. Feldman's paper was entitled "The Temperature Dependency of Resistance of Thin Metal Films" in which he reported on studies of the temperature dependency of resistance of vacuum deposited gold and platinum films between room temperature and 400°C. and 600°C. respectively. The Conference was sponsored by the University of Colorado.