MELPAR-A-GRAPH

Volume 6, Number 4 September, 1961

EXPANSION PROGRAM GETS UNDER WAY

Melpar's expansion and acquisition program gathered momentum with the approval by Melpar's stockholders of the merger of Television Associates, Inc., of Michigan City, Indiana, into Melpar.

Under the terms of the merger plan, Television Associates, Inc. has been merged into Melpar, and its wholly owned subsidiary, Television Associates of Indiana (TAI), became a wholly owned subsidiary of Melpar. The new subsidiary is currently well established, both nationally and internationally in the field of telecommunication engineering. According to Mr. E. M. Bostick, Melpar's President, it is in a favorable position to expand its operations for providing technical assistance to under-developed and other foreign countries as well as operating and providing maintenance and training for telecommunications systems.

Melpar's decision to enter the telecommunications field was made after making a survey of this rapidly growing market. Use of microwave links for point-to-point communication circuits is increasing significantly. Users include the communication, transportation, pipeline, and other large private businesses, and the United States and foreign governments. Communication links are one of the first requirements in the U. S. aid programs in under-developed countries.

TAI presently has contracts with the International Cooperation Administration to provide system engineering for point-to-point microwave communication networks in Pakistan, Turkey, Iran, Laos, Vietnam and Thailand. This engineering work involves site surveys, specification preparation, installation supervision, system test and operation, and training of customer personnel. In addition to foreign operations, they are engaged in aerial terrain surveys for highways, pipelines, powerlines and microwave links for numerous customers in the United States.

Captain William C. Eddy will remain as president with William C. Eddy, Jr. and Robert E. Garrels remaining as Vice President for Overseas Operations and Executive Assistant, respectively.

MILLION DOLLAR AWARD FOR RESEARCH DIV.

The U. S. Army Chemical Center has awarded $990,000.00 to Melpar as Phase IV funding under the company's existing prime research and development contract.

The work on this contract is being performed by the Research Division under the direction of D. M. MacArthur, Manager of the Chemistry and Biological Sciences Laboratory.

COMMUNICATIONS DEPT. DELIVERS WEATHER DATA RECORD VIEWER

The Communications Department recently delivered a Weather Data Record Viewer to the University of Dayton under a contract sponsored by Aeronautical Systems Division, Air Force Systems Command, Wright Patterson A.F.B. The Melpar developed equipment is to be used in processing weather data which the Air Force has accumulated in order to develop a statistical method of weather prediction.

Fully transistorized, the Weather Data Record Viewer provides a means of: (1) automatically reading 18 digit Unitary Decimal Digital records; (2) reducing the redundancy of the data contained in the charts; (3) linearizing a maximum of three non-linear parameters in each set viewed prior to final readout; and (4) functionally adding the correction obtained from one scanned value to a second scanned value prior to read-out.

Design and development on this contract was completed in B. R. Boymel's Communications Department by Principal Engineer V. G. Gedmin under the direction of M. G. Watson, Head of the Advanced Communications Laboratory, after initial assignment to the Applied Science Division.

WEST COAST DIVISION ESTABLISHED

Mr. E. M. Bostick, President of Melpar, recently announced the formation of a new division on the West Coast—Western Engineering Laboratories at Los Angeles, California. According to Mr. Bostick, the new West Coast division was set up to provide increased service capabilities and liaison between Melpar and expanding Defense Department operations on the West Coast.

The new division will be under the general managership of Arthur N. Corner, former head of Melpar's Production Division. Mr. Corner was a program manager with the Space Technology Laboratory of Thompson-Ramo Wooldridge prior to returning to Melpar for his new assignment.

Mr. Bostick indicated that the Company does not plan to relocate any part of its Eastern division operations to California.

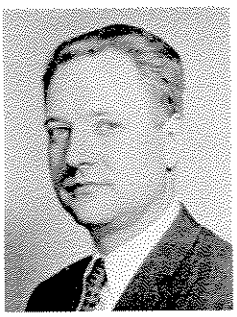
MELPAR TO PRODUCE SPECIAL TILE FOR NAVY

As a result of the joint efforts of the Special Products Division and the Research Division, Melpar has received a production contract to supply over 65,000 vibration damping tiles to the Navy. The Special Products Division has assigned responsibility to the Research Division for setting up the process and facilities for production of the tile according to Navy specifications with J. R. Sayers, Supervisor of the Process Development Branch, as Job Coordinator.

The tiles will be produced at the Arlington Plant where the approximately 300,000 pounds of bulk materials to be used on this job can be delivered in carload lots by rail. The new contract marks another milestone in the Company's diversification program which began in 1959 with the formation of the Special Products Division.

BARNES APPOINTED PHYSICS LAB. HEAD

Mr. James C. Cryer, Jr., Applied Science Division Manager, recently announced the appointment of Mr. Roswell P. Barnes, Jr., as Head of the Applied Science Division Physics Laboratory. Mr. Barnes received a B.A. from Lafayette College in 1950, and subsequently began graduate studies in the Department of Physics at Brown University. While there, Mr. Barnes became a Research Assistant, conducting investigations of ultrasonic phenomena. He is currently completing the program for the Ph.D. degree. The subject of his doctoral thesis at Brown University is the absorption of finite amplitude ultrasonic waves in liquids.



R. P. Barnes, Jr.

Since joining Melpar in 1956, Mr. Barnes has conducted investigations of surveillance detection systems, of problems in acoustic sensing and transmission, and of telemetry systems.

Mr. Barnes was technically responsible for the Applied Science Division's High Altitude Acoustics program. Recently he has directed programs for the measurement and analysis of data from rocket-borne magnetic sensors, and for unusual and sophisticated seismic signal acquisition methods.

Cole To Serve On National Defense Committee Of The U. S. Chamber Of Commerce

Ralph I. Cole, Director of WABCO's Government Project Service Office, has accepted an invitation from the Board of Directors of the Chamber of Commerce of the United States to serve as a member of the Chamber's National Defense Committee for the coming year.

The Committee studies national problems that are of particular concern to defense-supporting industries, and helps develop Chamber of Commerce policies and programs to meet these problems.

HI-REL ASSEMBLY PACES MM TRAINING

Assembly of the first Hi-Rel (high-reliability) boards for the Minuteman Program was started during the week of September 25th in the Division's "clean-room" facilities at Leesburg Pike Plant. This event marks a significant milestone in Melpar's Minuteman Program. Before the first Hi-Rel assembly could begin, special clean-room facilities had to be designed and constructed, and fabrication, assembly and inspection personnel had to be trained and certified to meet Minuteman Hi-Rel standards—all in the short span of little more than three months from the awarding of the Minuteman subcontract by Autonetics, a division of North American Aviation.

Nine assembly and inspection personnel have completed the training course taught by Foreman W. G. Tilley and were required to qualify on a written test as well as a performance certification test. Those awarded certification papers enabling them to perform assembly and rework duties on Minuteman equipment are: H. Crockett, M. Ehlers, L. M. Jones, C. Sauchak, and C. L. Mullins. In addition, K. Dryer, G. George, J. B. Gregg and B. Ullom were certified to perform inspection duties on the program. A second certification training course is now in progress to keep pace with the assembly requirements of the Minuteman program. The new trainees are: M. Addison, E. Bucher, K. Drinkard, W. D. Holston, H. Jackson, H. King, H. McCreary, B. Puffenberger, E. Reilly and A. S. Russell. The training program for Minuteman personnel will be conducted on a continuing basis in the areas of program indoctrination and motivation, materials handling, storing and kitting, quality control, reliability, drawing format, engineering orders, and board fabrication techniques. The motivation meetings are held monthly for all Minuteman personnel to keep them up-to-date on the latest developments in the program with special attention given to promoting high-reliability—the key word in the Minuteman Division.

In fact, Hi-Rel has been the key-word in all of the Division's preparation for fabrication of Minuteman Circuit Assemblies. The clean-room facilities as well as the training program reflect this emphasis.

The clean-room requirements for these facilities are comparable to most hospital operating room conditions and are explicitly spelled out in a Process Specification made a part of the current contract, their purpose being to rigidly control the dust content, the humidity, and the temperature of the environment in which components and modules for the Minuteman inertial guidance and flight contr[illegible] systems are assembled.

Minuteman Review Team . . . (L to R) Mr. David Stewart, Assistant Factory Manager for Computers and Data Systems, Autonetics, a division of North American Aviation (Downey, Calif.); Mr. Don Beeman, Head of Autonetics Team at Melpar; Mr. Ray Hammeras, Autonetics Representative for Assembly Operations at Melpar; and Mr. K. E. Schreiber, Melpar's Minuteman Division Manager. Mr. Schreiber greets Mr. Stewart upon his arrival from California to survey facilities and review progress.

Operating procedures in the clean-room require personnel, including visitors, to wear nylon or cotton gloves and nylon smocks while engaged in work on the Minuteman equipment. Smoking, eating and drinking are not permitted in this environment.

The Minuteman Division is extending the experience gained in present and past programs such as the Airborne Electronic Reconnaissance Systems and related ground support equipment, and the Missile Fuze Programs which also require high reliability products manufactured in controlled environments.

W. G. JAMES AUTHORS RFI ARTICLE

An article entitled, "Digital Computer Simulation for Prediction and Analysis of Electromagnetic Interference" by W. G. James, Advance Programs Analyst, and D. R. J. White, of Don White Associates, was published in the June 1961 issue of the IRE Transactions on Communications Systems. Presented at the 5th National Communications Symposium, the article describes a digital computer simulation program for use by communications systems and equipment designers who must consider electromagnetic interference.

MELPAR PARTICIPATES IN NSF PROGRAM FOR HS STUDENTS

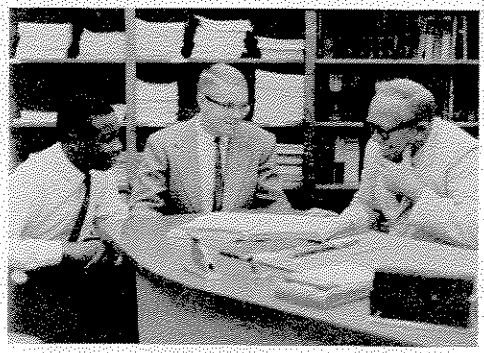
Three of the area high school students who were selected by the National Science Foundation for its 1961 Summer Research Participation Program for High-Ability Secondary School Students spent their summer vacation in Melpar's Research Division Laboratories as a result of the Company's participation in this program.

The three students, Andrew Butz of George Washington H. S., Alexandria, Dirk Hoekstra of Wakefield H. S., Arlington, and Charles Walden of Eastern H. S., Washington, D. C., were given a tour of the Research Division Laboratories; after which they selected the laboratory in which they wished to work during the summer.

The student scientists indicated that some of the prime values which they derived from the program were development of some research skills, confirmation of their particular scientific interests and stimulation to pursue new and more specific interests resulting from their laboratory experience at Melpar. Andrew Butz whose immediate interest is in theoretical thematics learned to use the IBM 1620 computer as a result of his experience in working with Dr. Y. Chu of the Exploratory Research Laboratory. In order to analyze various chemicals used in the Ammonia Battery for Dr. J. Ambrose, Physical Chemistry Branch Supervisor, Dirk Hoekstra learned to use wet chemical methods of analysis as well as the Mass Spectrometer and the gas chromatograph. Pursuing his interest in amino acids, Charles Walden developed considerable skill in the use of the Beckman Spectrophotometer, Beckman Expanded Scale Meter, Mettler Semi-Micro Balance, Electrophoresis Apparatus, Centrifuge, and Chromatogram according to B. Vasta, Biochemist of the Biochemistry Section with whom Charles worked.

The boys are all beginning their senior years in their respective high schools and on the basis of their academic records appear to be candidates for top honors in their class. Contrary to the popular conception of such students, these three have strong extracurricular interests in athletics, music, etc., typical of the "well-nded" high school student.

The Summer Research Participation Program for High Ability Secondary School Students in 1961 was a "whopping success" according to Dr. Leo Schubert of The American University who served as Director of the Program. Dr. Schubert stated that the program, now in its second year, was developed on a local basis but hopes to see it expanded into a national program. In addition to the National Science Foundation, the Program was supported by the Washington Academy of Sciences and the Research Participation Committee of the Joint Board on Science Education, and co-sponsored by ten companies (including Melpar) and government organizations in the Washington Metropolitan Area. The boys were given a scholarship by the National Science Foundation of $10.00 per week to cover their expenses incurred through participation in the program.



AFTER A SUMMER IN THE LABORATORY—(L to R) Charles Walden and Dick Hoekstra discuss their experiences in the Research Division's laboratories as participants in the National Science Foundation's Summer Research Participation Program for High-Ability Secondary School Students with Dr. P. E. Ritt, Director of Research. The third member of the trio who had spent the summer at Melpar, Andrew Butz, was not available for this picture. Photo by Glittenburg.

MELPAR RECEIVES THIRD BIONICS CONTRACT

A new contract providing $76,600 for research to investigate the feasibility of using artificial neurons (artrons) to develop more reliable flight control systems has been awarded to Melpar by the Flight Control Laboratory, Aeronautical Systems Division, Air Force Systems Command. The new contract is in addition to the two previously reported Bionics contracts awarded to the Company by the Electronic Technology Laboratory of the Air Force Systems Command.

The new study contract has been assigned to the Advanced Computer Laboratory of the Computer Department under the direction of Dr. E. B. Carne. According to Dr. Carne, a major consideration in the feasibility study will be the ability of an artron net to compensate for internal failures by reorganization. The artron functions similarly to the neurons in the brain; that is, a chain or net of artrons may be formed which have the capability of organizing themselves to accomplish a given goal. The generalized artron may be rewarded or punished so as to retain or change its logical state until systems goals have been fulfilled.

Dr. Carne postulates that in this type of system, failures of redundant components will not affect system performance, except for periods of reorganizing, until there are less logic components left than are required to accomplish the system functions. At this point system performance will start to degrade rather than fail abruptly. It is precisely this type of system which is required for the control of extended missions.

The projected use of computers in the fulfillment of this contract for theoretical study of artron characteristics and computer simulation is an example of the current trend noted by W. G. Heffron in the March Technical Lecture toward increasing use of computer time in research and development programs. Computer time for this study will be programmed on the IBM 7090 computer and on analog computers at Aeronautical Systems Division.

PULLARA GIVES PAPER AT RFI SYMPOSIUM

Senior Electrical Engineer Joseph C. Pullara of the Antenna Laboratory presented a paper entitled "Model Techniques for Interference Measurements" on June 13th, to the Third National Symposium on Radio Frequency Interference.

Mr. Pullara's presentation described the development of model techniques using electromagnetic, hydroacoustic and optical media and illustrated their application to the solution of Radio Frequency Interference problems. The ultimate objective of the program reported in this paper is to develop a suitable modeling and measuring scheme having the component deployment capability of a model train set. According to Mr. Pullara, mobility of (model) site components, such as antennas, buildings towers, etc., allows the RFI engineer to measure and predict the radiation characteristics of existing and future antenna systems. This measurement and prediction capability, through modeling, provides a means for selecting the optimum system orientation of future sites for a minimum RFI potential without compromising the intended system performance. The development program described in this paper is sponsored by Rome Air Development Center, Air Force Systems Command, United States Air Force.

New Products Corner

(This is the thirteenth in our series of reports on new products being marketed by Melpar's Special Products Division)

TUNING FORK FREQUENCY STANDARD

High accuracy, low cost and miniaturized packaging are a few of the outstanding features of the Tuning Fork Frequency Standard, the newest development of the Special Products Division. This unit is the first of a line of SPD Frequency Devices introduced at the WESCON Convention in San Francisco on August 22nd. Typical applications for these items include use as a frequency reference for aircraft and missile guidance systems, precise time base for high speed counting, and clock pulse generator for tape recording.

The Frequency Standard, utilizing a unique concept developed by W. P. Asten, of Special Products Division, contains the resonating element, pick-up and drive coils, transistorized oscillator, and special shock mounting pads in a miniaturized case weighing less than 3 ounces. This environment-resistant unit *simultaneously* produces both square wave and sine wave outputs over wide ranges of temperature and frequency.

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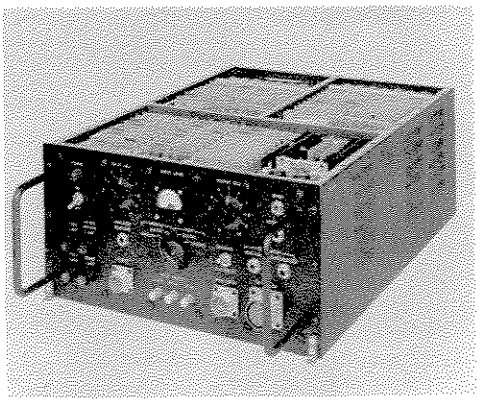

SPEECH COMPRESSION SYSTEM . . . This flyable, fully transistorized system was developed for the Aeronautical Systems Division at Wright-Patterson AFB by Melpar's Communications Department under the direction of Project Engineer D. M. Early. Honors for the design and development of the system go to Senior Engineers D. C. Coulter, R. E. Irons and J. Murray. S. J. Campanella, Technical Assistant to the Director of Research, served as technical consultant on the system.

Melpar Grounds Win Garden Club Award

"Progress doesn't have to be ugly," according to the Garden Club of Fairfax.

To prove their point, the group recently singled out Melpar, Inc., and four other Northern Virginia firms to receive the first annual "Beauty Is Good Business" award. The commendations, in the form of inscribed plaques, were presented by club Vice President, Mrs. Robert Walker, at the Red Cross chapter house, Fairfax, Va.

Test Set Shipped . . . W. T. Danbury, Chief of the Contract Branch, U. S. Air Force Falls Church Suboffice (left) and W. B. Hicks, Air Force Quality Control Representative at the Leesburg Pike Plant inspect the AN/MLM-1 during final mechanical check-out prior to shipment to the Air Force. This mobile, air-transportable unit aids maintenance of a complex airborne electronic system (34 major components and 1200 transistors, 1800 tubes and 5700 diodes) through automatic maintenance testing, end-to-end confidence testing and basic system calibration.
Its companion piece, the AN/GLM-1 shop tester, was shipped earlier this year. The AN/GLM-1 is applied in the shop checkout of major components of a large airborne data-gathering system and its subassemblies. Used to supply power, simulate accurate system inputs (r-f, analog, and video), and to monitor amplitude, pulsewidth, timing, prf and other outputs, the self-testing set detects and determines malfunctions to a removable package and also aids in the calibration of the system.
Design and development of the AN/MLM-1 and the AN/GLM-1 were accomplished by the Reconnaissance Department with Air Force executive and technical management from the Dayton Air Force Depot.
Photo by Sakamoto

NEW 1000-BIT-PER-SECOND SPEECH COMPRESSION SYSTEM DEVELOPED BY MELPAR

The Communications Department has developed a speech compression system based on formant tracking and capable of communicating speech in a total bandwidth of 150 cps. This is 20 times less than the bandwidth required to achieve comparable communication by conventional means. When digitized—and the Communications Department's system provides for digitized transmission—this compressed speech signal can be transmitted at an information rate of 1000 bits per second.

The system, developed under contract with the Aeronautical Systems Division of the Air Force Systems Command, is expected to find important applications in spectrum conservation, coded communication of speech, and long-range speech for global systems and manned space craft. Weighing less than 50 lbs., the current model occupies only 1.3 cubic feet.

First results of Melpar's new speech compression system were reported recently by S. Joseph Campanella at the GLOBE-COM V Symposium in Chicago in a paper titled "A 1000 Bit Per Second Speech Compression System," co-authored by Mr. Campanella, D. C. Coulter and R. E. Irons.

GOING UP!

Promotions include S. Balk and F. A. Behrens to Senior Electrical Engineers; E. F. Birckhead to Supervisor, Technical Writing; J. J. Crane to Senior Mechanical Engineer and D. M. Davis to Secretary.

H. De Schmertzing advanced to Senior Chemist; R. E. Eaton to Project Engineer; K. W. Friend to Senior Test Engineer and J. J. Fugate to Systems Engineer.

P. H. Halpern rose to Consulting Project Engineer; R. A. Henry to Subcontract Buyer and M. N. Ingrisano to Chief of Publications. W. F. Sloan and A. M. Yee were promoted to Junior Chemical Engineer.