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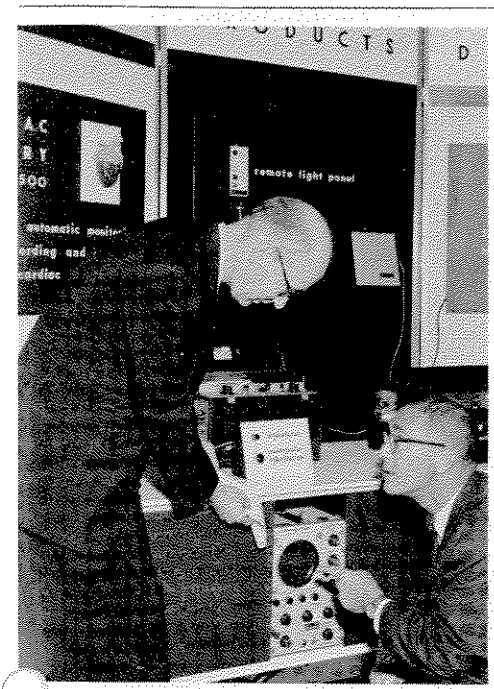

...e's a Beauty . . . Melpar's electronic nurse, the Cardiac Sentry, is shown during a recent Special Products Division demonstration at the Falls Church Plant for a selected group of Northern Virginia physicians. B. H. Dennison, Assistant to the Manager of SPD (standing at left), and Dr. J. N. Baum, Medical Consultant to Melpar, explain the operation of the Cardiac Sentry. Attending physicians were able to observe the Sentry's responses to inputs simulating various heart malfunctions as they flashed across the oscilloscope connected to the Sentry for demonstration purposes.

Featured in the New Products Corner of this issue, the Cardiac Sentry was unveiled at the 4th International Conference on Medical Electronics in New York City by Mr. Dennison and Dr. Baum in July. They have given repeat performances since that time for several state Heart Association meetings and at the American Heart Association Convention at Miami Beach, Florida. Photo by Glittenburg

LECTURE SERIES PRESENTED AT ASD BY DR. FRIEDLAND

Dr. Bernard Friedland, Senior Staff Consultant at the Applied Science Division, has recently presented a series of lectures for Applied Science Division personnel and interested scientists in the Boston area. The lectures concerned new developments and techniques in control ...tem theory as applicable to the design ...optimum control systems.

In addition to Applied Science Division personnel attending the lecture series, visitors have included personnel from the Massachusetts Institute of Technology, and M.I.T. Lincoln Labs.

Melpar To Adopt PERT

"PERT", word symbol for Program Evaluation and Review Technique, will be heard increasingly around Melpar during ensuing months as the Company adopts this new management control technique. Described in the Wall Street Journal as "the first real breakthrough in management science in the last ten years," the new technique enables the program manager to take a "3-D" view of his project or program in terms of the time relationships or interdependencies between the events which must occur on the way to job completion. A construction company analyzed an office building plan, using the Critical Path Method (a version of PERT used in the non-defense fields) and found that under its first plan a cafeteria was scheduled for completion while construction hoists were still passing through it.

PERT does much more than simply reveal timing conflicts in a program. By identifying the sequence of events which will require the most time (the critical path), the program manager is able to concentrate his efforts on these critical events. A delay in the events or tasks along the critical path necessarily would delay completion of the entire program. All other tasks, about 90% of the total, can be delayed for varying amounts of time without slowing down the entire project. When troubles do arise in the program, PERT again enables the program manager to identify the tasks that must be expedited. Thus PERT provides a method which permits the program manager to concentrate on problem conditions as well as assigning his resources where they can be most effectively utilized for successful program completion.

Developed by the Navy for management of its highly successful Polaris program, PERT is credited with a major role in placing Polaris I missiles in submarines more than two years ahead of the original 1963 target date. The success which both the Air Force and the Navy have experienced in managing subsequent programs in which this system of status reporting and job control has been employed has led them to specify its use by contractors and sub-contractors in many contracts now being bid and negotiated.

A five-day PERT seminar was conducted at the Falls Church Plant during the week of October 2-6 for Program Coordinators from the Program Management Directorate, and representatives of other directorates and divisions to train them in the use of the new technique.

R. I. COLE HEADS WABCO'S NEW GOVT. PROJECT SERVICE OFFICE

Melpar President, Mr. E. M. Bostick, has announced the concluding of an agreement with the Westinghouse Air Brake Company to provide consulting services to their divisions and subsidiaries in planning long range, broad scope government marketing operations, stressing combined resources and capabilities. This new function will not alter the present responsibilities of WABCO's Division or Subsidiary Government Program Planning and Sales Offices.

In addition to Melpar, Inc., the WABCO group includes six major operating units: Air Brake, Union Switch and Signal, Le Roi and Industrial Products, divisions; and the LeTourneau-Westinghouse Company and the George E. Failing Company, subsidiaries. These already serve large industrial segments of our national economy and involve international operations.

A new corporate Government Project Service Office has been established to carry out this responsibility with Mr. Ralph I. Cole, formerly Manager, Military Project Planning, named as Director of the Service.

RESEARCH DIV. SCIENTISTS PRESENT PAPER TO AMERICAN CHEMICAL SOC.

A paper entitled "Novel Phosphorus Containing Polymers" was presented at the annual meeting of the American Chemical Society on September 5th by Dr. N. Filipescu, Chemical Engineer. Co-authors of the paper with Dr. Filipescu were Dr. H. E. Podall, Organo-Metallics Branch Supervisor, and L. M. Kindley, Organic Chemistry Branch Supervisor.

IRE TRANSACTIONS PUBLISH KATZ PAPER

A paper entitled "Interference Computations for a Complex Signal Environment" has been published in the May issue of IRE Transactions on Radio Frequency Interference. The paper, authored by Principal Engineer Louis Katz of the Applied Science Division, was originally presented to the Professional Group on Radio Frequency Interference on 18 May 1960.

In his paper, Mr. Katz discussed a digital computer programmed to evaluate the interference existing at each receiver in a large scale army deployment involving approximately 20,000 receivers and transmitters.

EPR MASER SPECTROMETER DESCRIBED FOR INSTRUMENT SOCIETY OF AMERICA

The Instrument Society of America heard a report on the "EPR Maser Spectrometer" presented by Senior Physicist M. R. Kagan at its Fall Instrument-Automation Conference and Exhibit held at Los Angeles, California on September 13. Authored by Kagan, N. McAvoy, Quantum Electronics Branch Supervisor, and VW. T. Townsend, Physicist, the paper analyses maser amplifier-oscillator combinations in various systems, and describes an experimental design based on these theoretical calculations.

The research reported in this paper was singled out for special attention in the *Instruments* section of the September 18th edition of Electronic News.

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NEW COMMUNICATIONS THEORY LAB HEAD NAMED AT ASD

Steven M. Sussman, formerly Senior Research Engineer, has been appointed Head of the Communications Theory Laboratory at Melpar's Applied Science Division, Watertown, Mass. Dr. Sussman has an extensive background in the statistical theory of detection and estimation applied to radar, sonar, and communication systems. With Melpar since 1954, Dr. Sussman has been concerned with the utilization of spread-spectrum techniques in a number of areas. He has been responsible for the theoretical analysis and functional design of communications systems to combat natural disturbances and to provide anti-jam protection. He has evolved techniques, based on the methods of modern network theory, for the design of wideband, matched filters for use in communication or in pulse-compression radar.

Dr. Sussman has acted as consultant on numerous projects requiring the application of decision theory and related mathematical and statistical techniques. His most recent work is a study of the synthesis of radar ambiguity functions.

Before joining Melpar, Dr. Sussman served as Engineer at the U. S. Naval Ordnance Laboratory, under the MIT Cooperative Program, on the design, construction, and testing, of electronic equipment for guided missile research; as Engineer with the Philips Electric Co. in the Netherlands, on the development of pulse test circuitry in a digital computer group; and as Research Assistant in the MIT Servomechanisms Laboratory on information-processing problems for a numerically-controlled milling machine.

Dr. Sussman holds S. B. and S. M. degrees from M.I.T., and received his Dr. Eng. degree at Johns Hopkins University.

PERT Seminar . . . Certificates were awarded to all participants at conclusion of the five-day PERT Seminar. Standing left to right are: M. J. Costello, Senior Systems Analyst, V. E. DuBois, Supervisor of Reliability and Quality Control Administration, H. F. Sykes, Assistant to the Executive Vice President, W. C. Purple, Vice President for Engineering and Manufacturing, N. F. Ganzert, Manager of Administration for Program Management, Dr. L. A. Schmidt, Company Consultant, L. Brown, Director of Program Management, D. W. Sawtelle, Program Coordinator, and W. F. Moore, Manufacturing Control Supervisor. Seated left to right: H. C. Wilson, Program Coordinator, C. R. Parker, Assistant Program Coordinator, W. H. Rogers, Jr., Assistant Program Coordinator, R. C. Earnshaw, Administrative Assistant to the Minuteman Division Manager, A. H. Cosby, Program Coordinator and J. J. Rooney, Purchasing Ager

Photo Inset: One of the PERT Seminar groups is shown in action on a typical PERT problem. E. K. Pulsifer, Research Division Administrative Staff Supervisor and L. E. Donadio, Applied Science Division Projects Monitor discuss PERT network taped to the wall while (l to r) W. F. Vivori, Assistant Program Coordinator, G. T. Klop, Production Control Manager, S. B. Cirolini, Senior Electrical Engineer, K. E. Fowler, Staff Assistant to the Vice President for Engineering Services, H. I. Gerson, Program Coordinator, and J. D. McLain, Program Coordinator, analyze data to be used in completing the network. When complete, the network will represent the time relationship between all the events which must occur in order to reach the program objective (delivery). Photos by Glittenburg.

Program Management Directorate Plays Key Admin. Role for Engr. and Mfg. Divs.

Many of Melpar's technical supervisors in the Engineering and Manufacturing Divisions are now finding it possible to devote more time to the supervision of design and development as a result of the administrative support they are receiving from the new Program Management Directorate. In describing their experiences with Program Management, several technical supervisors have indicated that they are now able to spend more time with circuits than with paperwork due to the assumption of part of their administrative load by the Program Managers and Coordinators—particularly that portion relating to the total program cost and delivery aspects of the job. Program Management is not only releasing technical groups from many of their administrative burdens, but is promoting successful job completion by providing increased job continuity through the required engineering and manufacturing steps.

Established in May of this year, Program Management takes a total view of each job and by bridging divisional lines, it supplies the continuity of scheduling and undivided responsibility essential to contract performance. The new directorate is specifically charged with establishing schedules, allocating the budgets, estimating and evaluating the costs, supplying coordination, monitoring progress of the job in its technical, schedule, and fiscal aspect, and supplying data to the customer and to Melpar Management. Program Management is also responsible for coordinating and reviewing the preparation of proposals assigned to the Engineering and Manufacturing Divisions. The new directorate is dedicated to the detection of problems at their very inception, and to the economical and timely delivery of the equipment.

In order to accomplish this extensive task, the new directorate has been organized into three functional groups—a Program Management Group, Production Control, and Program Management Administration. The Program Management Group is composed of Program Managers and Coordinators whose first and foremost responsibility is to manage the programs or contracts assigned to them—to establish a work plan and schedule, to make task assignments to participating groups, to establish budgets, to monitor outside subcontracts, and to ascertain that all contractual obligations are met. Contracts are assigned to individual Program Coordinators without regard to whether they are solely development, manufacturing, or combinations thereof. Cutting across all inter-divisional lines, they continuously compare all work progress against the original work plans. At the first sign of difficulty, either technical, manufacturing, scheduling or budgetary, they initiate corrective action and alert top management of impending problems.

The Production Control Group centralizes production control functions for the Engineering and Manufacturing Divisions into one organization to insure continuity throughout the several phases required for contract performance. The production control functions include activities such as initiation and follow-up on work orders and procurement actions, material control, and the generation and maintenance of detailed internal schedules. Planners are located by Production Control in pertinent laboratories and shops of the Engineering and Manufacturing Divisions to perform these functions. Technical personnel still provide technical direction on their work as it moves through the shops but it is no longer necessary for them to spend time in expediting activities.

The Program Management Administration Group functions as a service group to the rest of the Program Management Directorate. It gives support to the Program Managers and Coordinators, and to Production Control in the areas of bid and proposal preparation, maintaining job fiscal status data, and preparation of reports to management on major job status and back-log.

Though organized less than six months ago, Program Management is already proving its worth in terms of its primary objectives of assuring contract performance and reducing the administrative burdens of technical personnel.

GOING UP!

Recent promotions include H. S. Barmash to Senior Technical Writer, C. J. Bronco to Senior Scientist, and D. W. Caldwell to Systems Engineer.

V. J. DeCarlo advanced to Branch Supervisor, R. S. Flanders to Electrical Engineer, C. C. Fritsche to Senior Administrative Engineer, and C. R. Green to Methods Engineer.

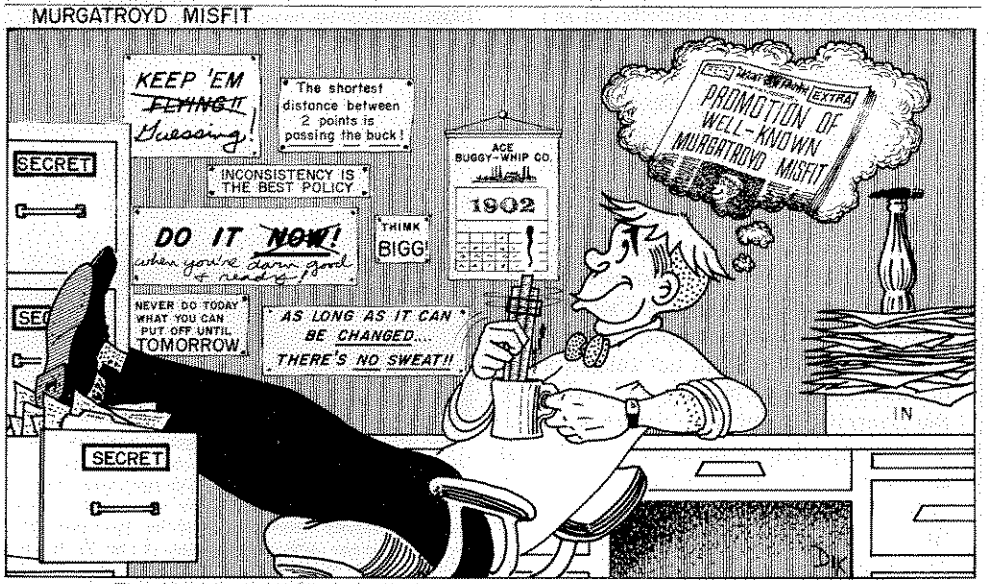
R. G. Haggerty rose to Electrical Engineer, A. E. Hilker to Inspection Foreman, R. G. Hoffman to Electrical Engineer, and E. P. Jordeth to Senior Systems Engineer.

L. R. Lankston was promoted to Principal Engineer and R. D. Larson to Project Engineer. L. R. Linstrom and R. F. Matthes advanced to Senior Electrical Engineer, J. A. Michael to Junior Specifications Engineer and J. W. Miller to Senior Planner.

C. H. Nelson moved up to Systems Engineer, L. J. Pouliot to Senior Research Engineer, W. G. Renfrow to Electrical Engineer, and L. P. Schoene to Principal Engineer.

F. A. Serafin was promoted to Junior Chemical Engineer, S. M. Sussman to Laboratory Head, and P. E. Taylor to Project Engineer. A. J. Wavering advanced to Branch Supervisor, and W. Welch moved up to Senior Electrical Engineer.

MURGATROYD MISFIT



The idea is good, Murgatroyd, but there is something about your methods.

Reprinted from August 1958 Melpar-a-graph.

New Products Corner

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

The Cardiac Sentry—newest and most advanced electronic heart monitoring medical aid—has been developed and is being marketed by Melpar's Special Products Division. This Multi-purpose, automatic electronic "nurse" for heart patients not only combines the functions of several less sophisticated machines that have been developed as electronic aids for the medical profession, but is the only machine which automatically detects variations in the rate and rhythm pattern of the heart, provides a record of any malfunction, and can administer previously prescribed treatment in emergency situations.

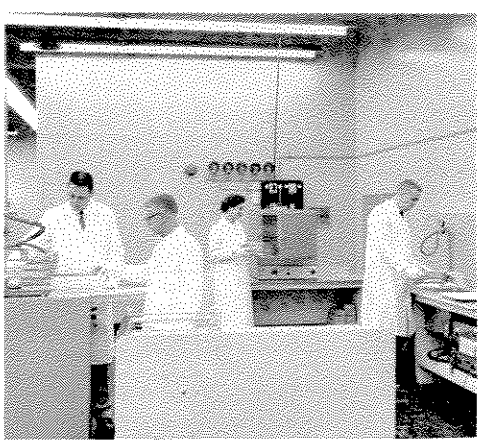
Extensive field evaluations in hospitals have led to enthusiastic acceptance of this reliable instrument.

The Cardiac Sentry is designed to operate in conjunction with most standard vacuum tube or tranistor type electrocardiograms. Using either the standard ECG electrodes and cables, or, preferably Melpar conformal electrodes and extra long flexible cables which allow freedom of movement for the patient, it receives impulses from the amplifier of the ECG. The Cardiac Sentry continuously monitors the pulse rate and the shape of the QRS complex with respect to set-in limits prescribed by the attending physician for tachycardia, bradycardia, arrest and QRS duration.

When any of these preset limits is passed, a distinctive warning light is illuminated, the ECG recorder is activated for fifteen seconds, the remote audio warning is sounded, other functions such as the administration of prescribed medication can be initiated and controlled, and a cardiac stimulator can be automatically activated in the event of cardiac arrest. The visual and audio alarms continue until the pulse rate or QRS duration returns to within the prescribed limits, at which time the electrocardiograph is again activated for fifteen seconds. The circuits within the Sentry are carefully designed to prevent accidental actuation of the instrument due to movement of the patient, and to detect and indicate the presence of broken or disconnected electrode leads.

On the Move . . . R. T. Benson, Jr., Senior Design Engineer, adjusts the Cardiac Sentry in the Special Products Division's versatile engineering laboratory on the mezzanine at the Bailey's Crossroads Plant. Also shown working on new products are (l to r) J. R. Bashista, Electrical Engineer and W. P. Asten, Senior Electrical Engineer. Photo by Norton

The Minuteman Division's first five certified assemblers show their skill in the LP 5 clean room with the second group of Hi-Rel boards to be processed.
Seated (L to R): M. Ehlers, C. Sauchak, H. V. Crockett (background), L. M. Jones, and C. L. Mullins. Standing: H. W. Shay (left) and W. G. Tilley, Foremen. Photo by Sakamoto



Four members of the Minuteman Production Control Group prepare Hi-Rel components for delivery to the clean room. Storage and kitting facilities available on the lower level of LP 4 are environmentally controlled just as the assembly area in upper LP5 clean room. L to R: R. M. Schwartz, R. F. Green, S. E. Logan, and W. E. Curry. Photo by Sakamoto

BIONICS SYMPOSIUM HEARS CARNE PRESENTATION

Dr. E. B. Carne, Advanced Computer Laboratory Manager presented a technical paper at the Second Annual Bionics Symposium held at Cornell University on August 31.

The paper, authored by Dr. Carne, E. M. Connelly, Test Engineer, P. H. Halpern, Consulting Project Engineer, and B. A. Logan, Electrical Engineer, is entitled "A Self-Organizing Binary Logical Element" and reports on basic research made possible through support and sponsorship extended by the Electronic Technology Laboratory of the Aeronautical Systems Division, Air Force System Command under contracts No. AF33(616)-7682 and AF33(616)-7834.

Describing a simple mathematical model which applies to most learning systems and showing how it leads directly to the self-organizing binary logical network, the paper was the basis for an article in the September 13 issue of *Electronic* Design entitled "Melpar Learner Uses Statistical Switch."

THIRD MINUTEMAN HI-REL TRAINING CYCLE BEGINS

The Minuteman Division's third Hi-Rel (high reliability) assembly certification class began on October 10 in the Minuteman training facilities at the Leesburg Pike Plant. The new Minuteman trainees are: E. Beecroft, B. L. Blankenship, J. R. Charlton, P. L. Cullers, J. R. Dodge, W. L. Haywood, E. R. Mulhearn, H. K. Settle, M. E. Smith, and J. L. Stauffer. The new class will include assemblers and assembly inspectors who will be trained for Hi-Rel component assembly and inspection.

Concurrent with assembly and inspection training at Leesburg Pike, a Process Control Course to certify personnel in plating and etching is being conducted for J. L. Sherwood's Raw Board Fabrication Shop at the Falls Church Plant. Under the instruction of Shop Foreman Al Sacks, the following personnel are preparing for plating and etching certification: L. C. Able, C. L. Branam, D. S. Close, N. L. Dickerson, A. R. Mangum, J. M. Moriarty, and G. W. Thayer.

Members of the second certification class who passed the assembly certification examination are: M. L. Addison, K. B. Drinkard, H. A. Jackson and B. I. Puffenberger. In addition three new inspectors have been certified from the second certification class—two for assembly and one for fabrication. They are respectively, H. King, E. Reilly and G. Donohue.