contract, pending assumption of support responsibility by the Government." The period of augmented support, Figure 17, begins at the time the device is accepted at the installation site and this is the point in time when device availability is most critical. Ideally, delivery of the device occurs prior to the delivery of the operational equipment and the need for training is greatest. Also, the support resources of the Government are at a minimum at that time. The Electronics Supply Office and the Aviation Supply Office have not had sufficient time to provision for spare parts to be available and the Navy Technicians have not been trained to maintain and operate the device; therefore, the contractor bears the responsibility for keeping the device available until the Government is in a position to completely support it. In the development of a plan for augmented support, the contractor must also realize that he will gradually phase himself out of total responsibility for maintenance. He must reduce his direct maintenance effort while the Navy Technicians increase theirs, until such point in time when the Navy will assume all of the maintenance of the device.

The contractor must also plan ahead for the repair of repairables and the replacement of items that fail during the augmented support period; this includes contractor acquired operational equipment. The contractor should explore every possible method of supporting all of the equipment used in the device, whether it be a digital computer, an item of unmodified operational equipment, a plotting board, power supply, etc. For critical items, such as primary operational indicators he may elect to provide spares in the form of a kit on site for rapid replacement in the event of failure. He may elect to enter into a call-type contract with the vendor of a particular component, such as a digital computer, or he may decide to utilize his own in-plant repair facilities. The possibilities are numerous and will vary from trainer to trainer; however, his goal should be to develop a plan to provide reasonable assurance that in the event a part fails it can be repaired or replaced in the shortest amout of time.

What we are striving to achieve through integrated logistic support is 100% availability of training devices. If we cannot support our training devices, the training devices cannot support the fleet, and consequently our military power will be weakened. We must plan our support as early as possible and then we must support our plan.

CONTRACTOR-CONDUCTED TRAINING AND TECHNICAL PUBLICATIONS REQUIREMENTS

Mr. J. D. Armstrong
Head, Training Applications and Publications Department

My presentation deals with two sections of Bulletin 40-1. I shall first address myself to Section 4, which covers contractor-conducted training courses. This will be follow by Section 6, which spells out publications requirements. As I present the information I will emphasize areas of general deficiencies on the part of the Government and on the part of contractors, and indicate in-work or possible solutions.

Section 4 is the requirement for the contractor to conduct operation and maintenance training courses. The objective of these courses is to train the minimum number of Government personnel to assume device maintenance, operation and programming responsibility from the contractor at the earliest possible date.

This requirement for the contractor to conduct operation and maintenance training courses is a two-edged sword because it also obligates the Government to supply the students for the course. I'd like first to discuss the Government's handling of its

obligations to provide the students.

Two types of personnel are designated as students for the courses: 1. Military technicians - normally Training Device Men - from the activity which will receive the device. 2. Civilian engineers/technicians from the Training Device Center.

The military personnel arrive at the course through a procedure which may have begun as much as 30 months prior to the course. The heart of this procedure is a Personnel Planning Conference at which the Navy's Enlisted Personnel Distribution Office is alerted by the Center to quantitative and qualitative personnel requirements. The staffing of the activity which will receive the device is examined for personnel status. The Chief and Senior Petty Officers whose present tours of duty end about course time are screened and appropriate personnel are tentatively tagged for their new assignment. Prerequisite knowledge or skill requirements are met, either through established Navy or industry courses, or adjustment of course content by the contractor. In the main, the Chief and Senior Petty Officers have the ability to master the new material and perform creditably on the trainer crew. The junior men may prove less than qualified. This is a fact of life which earlier specialized training will minimize in the future.

On full-blown Integrated Logistic Support Trainers the Navy crews are expected to become totally self-sufficient within twelve months of trainer acceptance. During this twelve month period the combination of the course or courses, on-the-job training, and increased assumption of maintenance duties results in a self-sufficient level of capability. They are then expected to reach and hold the high level of trainer availability with minimum NTDC back-up assistance.

Civilian engineers and technicians -- the NTDC Field Service Representatives (FSR) who provide back-up assistance for problems beyond the capability of the military technicians - normally assume their responsibility for back-up assistance via the "pipeline" route. The FSR will be assigned to the contractor's plant asa Government representative during the in-plant test phase. The initial familiarity gained as a test witness may be reinforced by his temporary assignment to a Navy or industry course on a specific computer or operational equipment. His return to the plant allows him to consolidate and back up his knowledge during final testing. During the installation and site-testing phase, and during the early stages of fleet utilization the FSR will attend the on-site training course.

What will the FSR's bring to the course?

They will bring a full spectrum of experience to the course. There will be simulation-experienced senior field engineers and technicians through new graduate engineers in a trainee classification. This wide range poses training problems which can only be handled through close cooperation between the Center's Education Specialists and the contractor training personnel. The Center will initiate and foster this common effort. The result should be a trained man who not only can back up military technicians in solving problems in-depth, but who can suggest preventive measures to preclude failures, and effectively conduct on-the-job training.

A course will thus have both military personnel from the activity responsible for the device and civilian personnel from the Center as back-up, with a well-balanced team to keep the device on-line the greatest percentage of time.

The course normally will be conducted at the site. It probably will be scheduled on a not-to-interfere-with-utilization basis, so that the fleet can have the trainer available for fleet training at the earliest possible date. This will result in a second-shift schedule in order to meet the course requirements for four hours per day of practical on-the-device instruction. Unusual fleet demands for utilization approaching 16 hours per day may push the course into a third shift.

The preparation of the course by the contractor will be progressive in accordance with a well-thought-through schedule. Approval is required and guidance is given on each submission of a course outline, course schedule, lesson plan , job plan , periodic test, and information sheet Improvement in this area is indicated as seen by recent rejections of instructional materials. Early guidance in this area is especially valuable and the Center's Education Specialist are ready to help.

A requirement for a pre-test may be new to many of you. The pre-test, prepared by the contractor and given before the course starts, is used to sample the capabilities of the student in a variety of subjects to be covered by the course. Upon agreement between the Education Specialist and the instructor, course adjustments are made to accommodate wide variations in student capability.

Contractor instructors are a vital ingredient in the course. Increasing Center effort will be expended to work with contractors in developing the qualifications of the selected instructor. This cooperative effort begins with the contractor's nomination, by name, of his course instructors and will continue through course completion. The Center finds an increasing need for complete contractor planning of instructor utilization. Too often the planning has been unrealistic resulting in undesirable substitutions and sub-standard instruction.

In some cases, some form of instructor training is indicated. This will be pursued and the Center will actively assist in making this available to the contractor through Navy sources. Recent actions to interrupt or terminate courses due to unacceptable instruction indicate the need for improvement in this area.

Similar improvement in planning is needed for adequate indoctrination of contractor-supplied device operators. Since they are the knob-turners who set up the simulation conditions for fleet personnel being trained on the device, their familiarity with the trainer capabilities must be intimate enough to respond to Navy instructor problem directions.

The future direction of contractor-conducted courses may include requirements for programmed instruction. Where course material will be repeatedly used for a number of students, or where it is desired to raise the level of knowledge of people reporting to a course by prerequisite training, programmed instruction may be required by the Center.

In summarizing the Contractor-training portion of my presentation I should like to point out that immediate and continuing emphasis will be placed on:

a. The quality of instruction.

b. The quality of instructional materials.

c. Frequent observation and evaluation by the Center's Education Specialists.

Now I should like to address myself to Section 6, Publications Requirements. The publications requirements remain essentially unchanged in Bulletin 40-1 from those you have experienced over the last two years; however, I approach this portion of my topic with no little concern. I am afraid that you, as contractors, will not recognize that other requirements of 40-1 change the approach you should take in preparing the publications. This is especially true in the case of the maintenance handbook. I will highlight the changes in approach in a moment, but first, the objectives of publications requirements.

The objectives of the publications requirements are to provide reference materials which will give detailed information on preventive maintenance, troubleshooting, repair, installation, inspection, operation, parts, programming and training use of the device. The publications take the following forms:

a. A Maintenance Handbook to guide the user in maintenance of the device and identification of its parts. The maintenance handbook is conventional in its approach except for the addition of Maintenance Requirement Cards - a pocket version of the scheduled inspection and maintenance requirements. ONR/NTDC Specification MIL P-82313 has been coordinated with the Army and is used on Army devices which are not type-classified -- that is, not bought in quantity and supported by the weapons support systems. The Air Force has not coordinated the specification as yet.

The data for preparation of the maintenance handbook is the area of concern to which I referred earlier. You, as contractors, should recognize that the MEARs (Maintenance Engineering Analysis Records)referred to by the previous speaker is a new approach to device data which consolidates in a series of documents much of the essential maintenance data on the device. These documents, along with maintenance drawings, contain most of the data needed for handbook preparation. This, in our view, is an important advantage which the contractor should examine; and then adjust his organization and procedures to exploit this advantage. Our very limited experience with the MEARs indicates a reduction in handbook costs may be realized. Your proposals will be evaluated with that in mind.

b. The Operator's Guide is a requirement which has few parallels. Its objective is to put in the hands of both the device operator, the enlisted technician who turns the knobs to create the simulated conditions, and in the hands of the instructor, the information on training capabilities of the device which will allow optimum utilization. The Operator's Guide, because it is training-oriented, may be out of the line of many technical writers. Since the Operator's Guide has been a hurdle for technical writers in the past, and since the need for this manual becomes increasingly evident, I strongly urge development of this capability. It is a requirement on all major equipment. I should like to emphasize here that we are particularly aware of the problems encountered in Operator's Guides and are anxious to offer guidance and assistance since a quality Operator's Guide is a most valuable tool.

c. The Programming Manual deals with the approach to programming the digital computer. It describes the operation of the computer program in sufficient detail to permit understanding of how programs function and how they are used in device operation, maintenance, debugging and program modification. By example, the procedures in processing a program modification will be fully described and the relationship of programming to the training process will be completely explored.

Because of the continuing shortage of experienced digital personnel, this manual is of particular importance. However, it has often been necessary to simply buy the already-existent general purpose computer manufacturer's programming manuals. In such a case, the device contractor has a special obligation to supplement the programming manual with special emphasis in the interface area.

Having talked about the specific handbook requirements, I want to mention trouble areas which have plagued the contractors and the Center rather continuously. The most urgent problem facing us is that quality control has not been brought to bear on the manuals. Information contained therein is inaccurate and frequently lags far behind the hardware. There are many reasons offered for lack of handbook quality control; design changes, poor data, no coordination, etc. Close scrutiny by Center personnel monitoring the project often reveals that the reasons were quite correct, but-they could have been avoided. The concept of Bulletin 40-1 encourages improved quality control by using the augmented support period to provide handbook feedback from actual use of the manual. Further, direct feedback from training course use of the manual as a text proves most effective when applied to control of manual quality.

Now I'd like to look a short distance into the future. In that future I see a specification numbered MIL-M-24100. It is a limited coordinated BUSHIPS Specification which spells out the new handbook concepts of SIMMS, also known as BAMAGAT. On selected projects the Center will call out this or a similar specification, adapted to

device requirements. An intensive evaluation program will measure its suitability to training devices, and research will seek out improvements. The Center feels that this is an important new approach to handbooks. It has its real pay-off in reduced training time, and deserves an extended effort on the part of both Government and contractor to take a step forward in the manual area. We'd like your cooperation in producing a new-concept handbook worthy of evaluation.

In summary, I should like to emphasize that quality control is the major hurdle that we must clear. The Center is anxious to cooperate in clearing this hurdle.

I should like to leave you with a few questions which will tie together the areas of contractor-conducted training courses and publications.

a. Are you fully aware of the common data sources which serve as a base for both training courses or publications?

b. Do you understand the abilities which both training courses and publications require of people working in these areas?

c. Have you capitalized on these commons in the way you organize and employ people in publications and training?

PROVISIONING TECHNICAL DOCUMENTATION AND REPAIR PARTS

Mrs. Frances S. Smith
Head, Support Liaison Division

With this presentation we begin Part III of the Integrated Logistic Support (ILS) area, and I will talk directly to Section 5 of Bulletin 40-1. It is the intent of Bulletin 40-1 to insure that "tools for more effective training" are indeed "available tools"; available throughout the life cycle of the training device. This can only be achieved by maximizing the maintainability characteristics of the device through the design considerations, and by determining the support requirements of the device as they are recognized throughout design and development. Objectively, Section 5 of Bulletin 40-1 aims to achieve a measurable increase in training device effectiveness through positive identification of training device repair parts, reduction in the range of parts by use of military standard items, standard commercial items, and multiple use of the same components in the system, improved availability of repair parts and reduced logistic support costs.

During this presentation, I will emphasize the importance and significance of the Contractor Augmented Support Period, highlight the important elements of Provisioning Technical Documentation and the need for adequate and timely submission of Provisioning Data to enable the Navy to procure repair parts, touch on the role of the Electronics Supply Office (ESO) in the Integrated Logistic Support Picture, and I will mention the "Supply Platform" which we work from.

Like astronauts soaring into the unfamiliar environment of outer space, the supply manager has been projected into the environment of Intergrated Logistic Support. Not all of the concepts are new, but in our new management world of technical supply--replete with such terms as reliability, maintainability, and supportability -- we are