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H.M.S. 'DAEDALUS'

THE ROYAL NAVAL AIR ENGINEERING SCHOOL

BY

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(*Formerly H.M.S.* Daedalus)

Introduction

Various articles have appeared in previous issues on air engineering training but now, in the post-EBD era, it is a fitting time to bring the story up to date. The Royal Naval Air Station, Lee-on-Solent, was first commissioned as His Majesty's Naval Seaplane Flying School in 1917. Ownership passed to the Royal Air Force when that Service was founded, but returned to the Royal Navy shortly before the Second World War.

Named H.M.S. *Daedalus,* the station became the Fleet Air Arm Barracks in addition to having an active flying task and was also the headquarters of the Flag Officer Air Home, later to become the Flag Officer Naval Air Command. After the War, as the Fleet Air Arm contracted and drafting patterns changed, the need for a barracks diminished. In 1959, the Air Electrical School moved in from Worthy Down to occupy the redundant accommodation bringing with it a temporary name change to H.M.S. *Ariel.*

Eleven years later, economies and CONSTRAIN brought the Air Mechanical School from H.M.S. *Condor,* the R.N. Air Station at Arbroath, to Lee-on-Solent which had already reverted to the name H.M.S. *Daedalus.* Since 1970, the R.N. Air Engineering School has been responsible for all

TABLE I—*Detail of career courses*

Course	*Length weeks*	*No. courses per year*	*Annual throughput*
Air Engineering Mechanic (Mechanical)	18	18	188
Air Engineering Mechanic (Weapons Electrical)	31	18	162
Air Engineering Mechanic (Radio)	24	18	88
Leading Air Engineering Mechanic (M)	15	9	144
Leading Air Engineering Mechanic (WL)	26	5	80
Leading Air Engineering Mechanic (R)	22	5	40
Petty Officer Air Engineering Mechanic (M)	16	4	64
Petty Officer Air Engineering Mechanic (WL)	20	4	64
Petty Officer Air Engineering Mechanic (R)	14	3	24
Air Engineering Artificer (M)—pre-field	21	3	44
Air Engineering Artificer (WL)	35	3	31
Air Engineering Artificer (R)	26	3	15
Air Engineering Mechanician (M)—pre-tech	27	3	35
Air Engineering Mechanician (WL)	21	3	17
Air Engineering Mechanician (R)	21	3	9
Technicians (Mechanical)	69	3	79
Technicians (Weapons Electrical)	86	3	48
Technicians (Radio)	84	3	24
General List Air Engineering Application Course	19	2	16
Special Duties Air Engineer Officers' Course	13	1	10
Conversion L—WL Technician	8	3	36
Conversion W—WL Technician	9	3	12
Conversion L—WL non-Technician	9	3	36
Conversion W—WL non-Technician	9	3	24

FIG. 1—GENERAL VIEW OF THE AIR ENGINEERING SCHOOL

technical training of Fleet Air Arm personnel. The accommodation of all sub-specializations at all levels of expertise in the one school has proved a considerable advantage, allowing control of syllabi with the ability to merge and modify them whenever this has been appropriate.

The Task

The task of the Air Engineering School is to give career course training to engineer officers, artificers, mechanicians, and mechanics of the Fleet Air Arm and also to provide short aircraft maintenance courses (SAMCOs) lasting from one day to twelve weeks in a wide variety of technical subjects.

As shown in TABLE I, there are twenty different career courses and, until all L and AW ratings have converted to WL, a further four temporary ones. There are normally up to sixty of these courses under training with about 700 trainees. This is a comparatively steady task that can be forecast well ahead,

although remaining pre-EBD courses will cause a considerable bulge over the next two years.

In addition to the career courses, there are some eighty SAMCOs offered. These vary widely in length and frequency and are designed to familiarize officers and ratings with specific aircraft equipments and techniques. SAMCOs are similar to PJTs, personnel normally attending them prior to joining squadrons or ships. The numbers requiring these courses vary very considerably and cannot easily be forecast. Whenever possible each course is planned to use spare capacity of career course instructors but inevitably this task leads to peaks and troughs in instructors and equipment loading. In any week there are about twenty SAMCOs running and some 1300 officers and ratings are trained each year.

Important SAMCOs, other than those concerned with particular aircraft and equipments, include:

Aircraft Wiring

These courses are tailored to meet the requirements of the trainees. They last for between one day and one week and are intended to show officers and ratings the many different types of wiring and terminations used in aircraft.

Aircraft Husbandry

This is a two-day course designed to instruct officers and ratings at various levels in the techniques of good aircraft husbandry, corrosion prevention and rectification. Despite a continuing battle, corrosion still takes an expensive toll of our valuable resources and is the cause of many defects. Aircraft husbandry is taught on all career courses and the SAMCO is designed as a refresher.

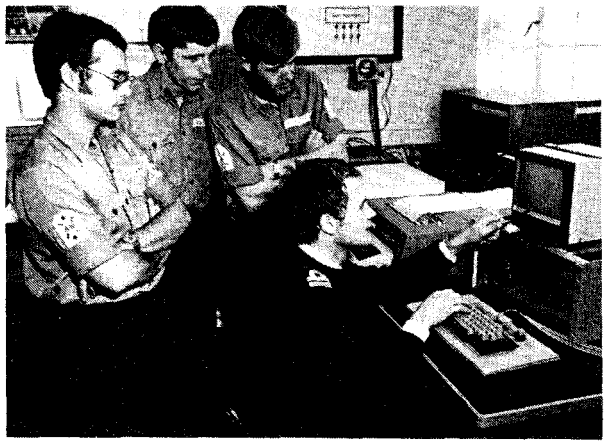

FIG. 2—DIGITAL TECHNIQUES LABORATORY

Digital Techniques

Digital techniques are now included in appropriate technician career courses and the SAMCO is designed to update older officers and ratings and to prepare them for specific Harrier and Sea King V equipment courses involving these techniques.

Welding

Basic and advanced welding courses of four and six weeks' duration respectively are available. These provide a range of training leading to AQD certification without which ratings may not weld any aircraft component.

Where appropriate, and particularly in aircraft wiring and husbandry, the School will send instructors to air stations and ships if it is more economical to give instruction on site.

Organization

Under the Director of Air Engineering (a commander AE) supported by the Training Commander (Policy and Design) (a commander AE) and the Training Commander (Education and Support) (a commander I), the School is divided into a number of training and administrative groups. These are shown in FIG. 3 and their functions are described below.

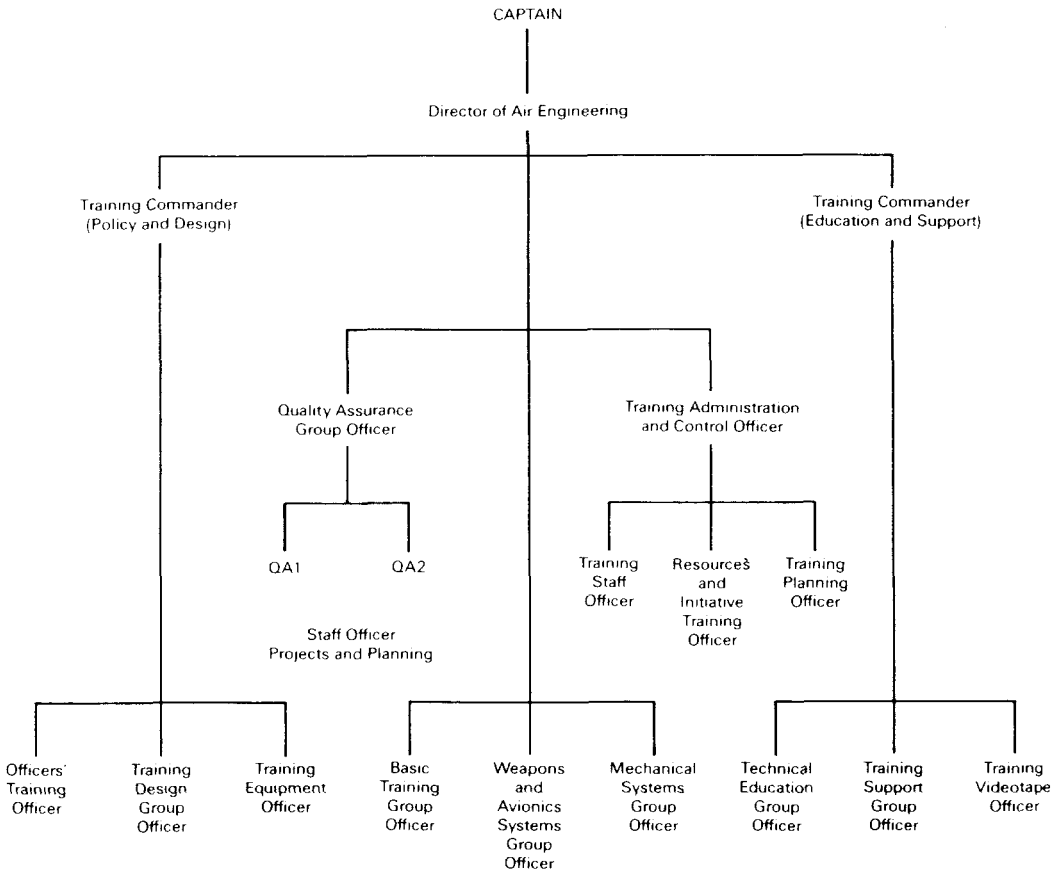

FIG. 3—THE MANAGEMENT STRUCTURE

Training Design

All courses start in Training Design where a group of officers and ratings use the principles of objective training to produce the course documentation. In the early days, objective training gained a very bad reputation in the Fleet Air Arm due to its engendering too narrow an outlook on the part of the trainees. Particular emphasis is therefore placed on getting the enabling objectives correct.

Training Design produces the Instructional Specification. It has also to ensure, in close liaison with Training Support and the Training Equipment Officer, that the necessary training aids are procured and that a suitable programme is produced for the assessment of the progress of trainees.

This Group was greatly enlarged to cope with the design and validation of post-EBD courses. The design work is nearly completed and validation has commenced. The team has already started to reduce in size but it will be nearly four years before all validation is completed.

Training Execution

Training execution is carried out in four Groups, namely Basic Training, Mechanical Systems, Weapons and Avionics Systems, and Technical Education. Each Group is led by a lieutenant-commander, the first three being responsible to the Director and the latter being responsible to the Training Commander (Education and Support)

Basic Training Group—In the Basic Training Group, mechanics fresh from their Part I Establishment are given their first taste of technical training. This Group covers all specializations. About 10 per cent. of the trainees are WRNS. For the first seven weeks, the course is common, covering safety

FIG. 4—MANHANDLING A WESSEX

precautions and basic aircraft servicing. The class is then divided into mechanical and avionics for further training. The latter group subsequently further divides into radio or weapons electrical. Although there is a lot of classroom work, the aim is to keep the course as practical as possible. During the course there are a number of progress tests which have to be passed and then, on completion, there is a period of three to six months' field training before the mechanic is fully qualified to work on aircraft.

FIG. 5—AN AIRCRAFT DECONTAMINATION TEAM PREPARES FOR ACTION

Mechanical Systems Group—This Group is responsible for all mechanical technical instruction, for the maintenance of some twenty instructional helicopters, for all electrical and mechanical craft training, for aircraft husbandry training, and for the Administration, Management, and NBCD School. This is a very wide task requiring a lot of space and facilities. An aircraft hangar provides spacious and well laid-out workshops for craft training, complete with classrooms and drawing office. Tasks are diverse— major airframe repairs are carried out on fuselages no longer required for other training; a series of aircraft sheetmetalwork exercises is carried out; basic fitting and turning, soldering, printed circuitry, and the latest techniques in miniature soldering are all taught. There is a well-developed programme for teaching GRP repairs.

Another hangar houses the training aircraft—a dozen Wessex Mk. 1 (the mainstay of career course practical work), a Wessex Mk. 3, and a Gnome-engined Whirlwind. There is a Seahawk to demonstrate fixed wing, and two Wasps and a number of more corroded Wessex for husbandry training.

These are soon to be joined by two elderly helicopters for battle damage repair training as new techniques are devised to keep even quite seriously damaged aircraft flying for yet another sortie.

The Administration, Management, and NBCD School has an important role to play. Due to the very high safety requirement and also the legal niceties for work on aircraft, paperwork is all important. The task of this section not only covers the multitude of forms connected with aircraft maintenance but also teaches management so that maintenance can be completed economically and in the most effective manner. The section trains officers and ratings of all trade categories. The NBCD training is specifically aimed at personnel protection and aircraft decontamination.

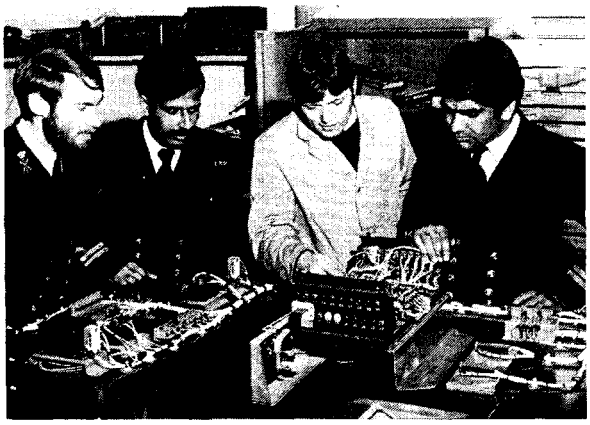

FIG. 6—FOREIGN AND COMMONWEALTH OFFICERS STUDY THE LYNX ELECTRICAL DISTRIBUTION SYSTEM

Weapons and Avionics Group—This is a very large Group that was formed at the end of 1979 as a result of EBD by amalgamation of the former Weapons Group with the Avionics Group. The Group provides all aspects of weapons electrical and radio training for the Fleet Air Arm and air weapons training for the rest of the Navy. Examples of equipments carried by naval aircraft are installed in the extensive laboratories and are used for career and for SAMCO training. Many of these rigs have been designed and built by the staff. Currently under construction are the Sea Harrier navigation and weapons system rig and the Sea King V LAPADS rig.

The brunt of the work of introducing redesigned post-EBD courses has fallen on this group. Their enthusiasm and co-operation has led to a smooth integration in the training for the new weapons electrical category.

In addition to its weapon and avionic task, the Group is responsible for the Lynx maintenance trainer. This is a superb purpose-built facility,

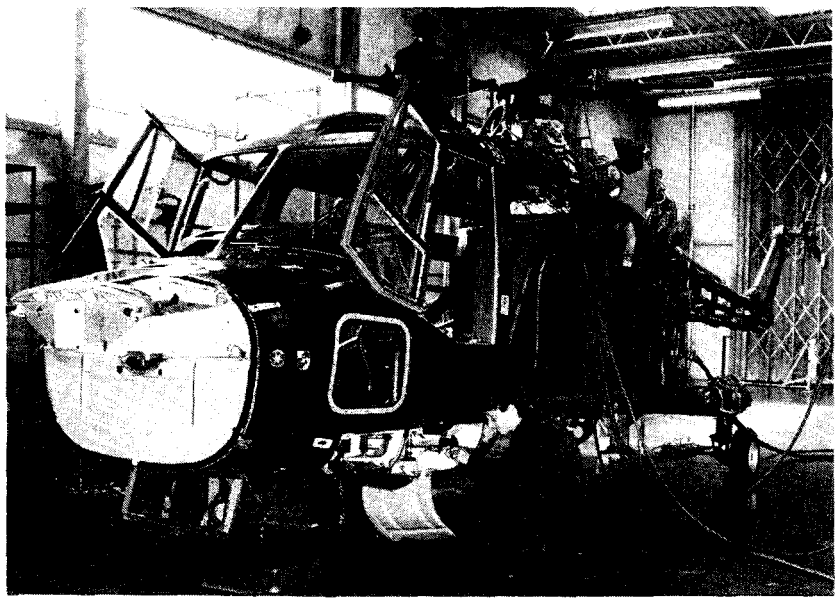

FIG. 7—WRNS MECHANICS WORKING ON THE LYNX MAINTENANCE TRAINER

containing four classrooms and four laboratories and is designed to teach systems rather than specific equipments. Two of the laboratories contain actual-size models of the Lynx so constructed that there is very little skin panelling and all the systems are on view; however, components are correctly mounted and can be removed and replaced in accordance with the appropriate manual. The other two laboratories have facsimilies of the fuel and electrical systems. The Lynx maintenance trainer is used to give technical training to all Lynx maintainers and aircrew.

Technical Education Group—The Technical Education Group is staffed by twenty naval and seven civilian instructor officers. Its task is to provide academic training to all Groups as required to support their many and varied courses. Under the main topics of electrics, electronics, mechanics, and mathematics, the Group teaches twenty-two different engineering subjects. Programming to ensure effective training of the many classes and efficient use of the instructors provides a major problem.

The fastest developing area in this Group is in the field of digital techniques and software training. The introduction of the Sea Harrier and the Sea King Mk. 5 with the computerized weapons and navigation systems has meant that this instruction has to be given not only to career courses but also to many of those returning for SAMCOs. The recent acquisition of seven Research Machines 380Z micro computers has greatly enhanced the capability of this section.

Training Support

The Training Support Group provides training aids, printing and graphics services, cinema, and presentations theatre facilities for the Air Medical School, the Safety Equipment and Survival School, and the Air Station as well as for the Air Engineering School. About 85 per cent. of their work is in support of the latter. Modern techniques are used to make viewgraphs and other visual aids, much of the work being done by WRNS TSAs under supervision of the draughtsmen or technical graphics officers where appropriate.

Two offset-lithograph printing machines are kept very busy producing notes in support of courses and many other documents required to sustain training.

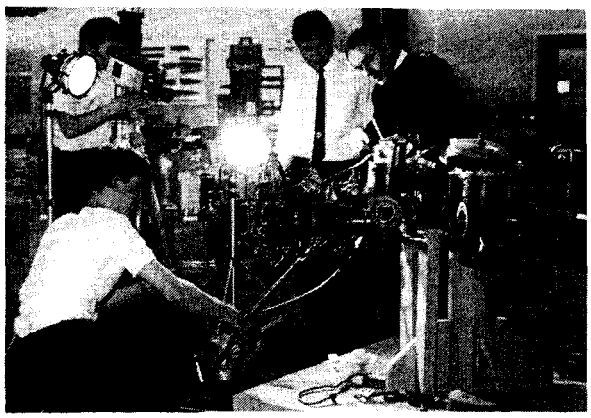

FIG. 8—THE CCTV UNIT PREPARES A VIDEOTAPE

The Naval Air Command Video Production Unit is based at *Daedalus* and is co-ordinated through Training Support whenever work is required for the Air Engineering School. This valuable aid is a means of improving effectiveness of training where accessibility would make it very difficult to demonstrate an equipment to more than one trainee at a time or where actual equipments are not available.

Quality Assurance and Assessment

All career courses have a formal programme of assessment to check the progress of trainees. Internal examinations are at two levels—criterion tests at the end of each module to check understanding and less frequent progress examinations to check retention. At the end of each career course the Naval Air and Marine Examination Board conduct a 'fitness-to-proceed-to-the-field' examination fulfilling the legal requirement for independent examination for air-

craft maintenance personnel.

Internal assessment and standards throughout the School are monitored by the Quality Assurance Group. Records of examination results are maintained by the Group and examination papers and answer papers are moderated and analysed to ensure that the standards are maintained by trainees and instructors. The Group has wide responsibilities for standards and practices throughout the School.

The Divisional System

In order to keep divisions small and to utilize the talents of the many officers in the School, a system of Divisional Groups is maintained separate from the Training Groups. There are four Divisional Groups—basic trainees, apprentices, mechanicians, and mechanics.

Basic Trainees

The Basic Training Group Officer is also responsible for this Divisional Group. He has three fleet chief air engineering mechanics as full-time divisional officers each with about 100 trainees. Divisional work and training is co-ordinated by two training officers and the class instructors form a direct link in the divisional chain.

Apprentices, Mechanicians, and Mechanics

The Training Design, Weapons and Avionics Systems, and Mechanical Systems Group Officers respectively head the apprentices, mechanicians, and mechanics divisional groups. The trainees are divided by classes or groups of classes into divisions up to twenty strong and divisional officers are selected where possible from officers instructing those classes. The training and divisional work are co-ordinated through a training office for each group manned by an engineer officer and two senior ratings.

The Mechanics and Mechanicians Training Officers work in close co-operation for the selection of mechanician candidates. Mechanician training is now available to WRNS mechanics and the first WRNS mechanician qualified in July 1981.

General Naval Training

As in all naval training, the need for academic and technical competence is matched by the need for alert, well-organized men with good leadership

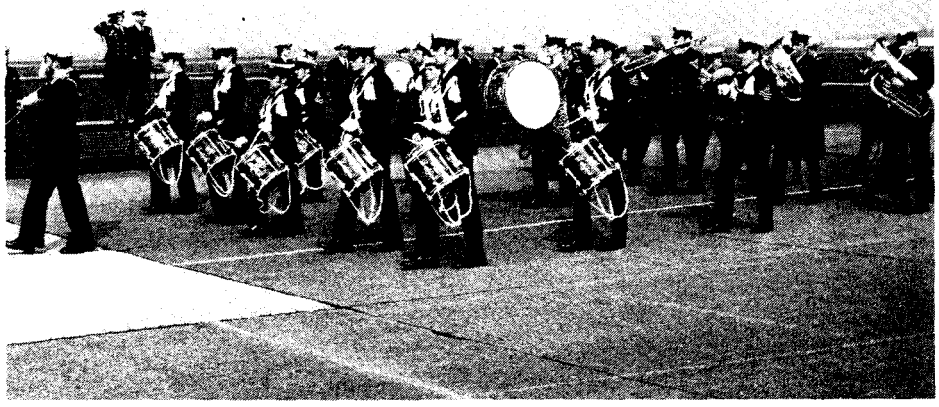

FIG. 9—THE VOLUNTEER BAND MARCHES PAST THE DIRECTOR OF THE W.R.N.S.

qualities. At the Air Engineering School, general naval training is regarded as being every bit as important as the technical and academic work.

The aim of general naval training is to produce disciplined, responsible, self-reliant men possessing confidence, courage, endurance, and self-respect. Much of this training is inherent in the day-to-day life of the establishment. It is hoped that insistence on good appearance, bearing, punctuality, meticulous performance of duties, a high standard of mess-deck cleanliness, and the opportunity to take charge both on and off the parade ground contribute to the achievement of this aim. There are numerous clubs and activities that offer further opportunities to broaden interests and to develop personal qualities, particularly as they are run almost entirely by the participants. Some of the more popular are listed below:

Angling	Golf	Sub Aqua
Car maintenance	Modelling	Volunteer band
Drama	Sailing	Water skiing
Gliding	Shooting	

The more formalized general naval training falls under five headings:

1. Parade Training
2. Sport and Recreational Training
3. Religious Training
4. Resource and Initiative Training
5. Community Service

The amount of parade training varies according to course requirements but all career courses attend morning divisions once a week and Air Engineering School or Station divisions once every four weeks.

All younger trainees have half an hour of physical training per week and all career courses have one recreation afternoon per week. The airfield, Manor Way, and Seafield Park provide adequate pitches for rugby, soccer, hockey, and cricket. There are an excellent indoor games area and a well-equipped gymnasium. Organized sports are arranged during the recreational periods but trainees are also encouraged to follow other activities. There are a ·22 rifle and pistol range, squash courts, and tennis courts, and also a full programme of inter-divisional sport. Station teams are fielded in most sports.

Religious instruction is included in the syllabus for air engineering mechanics and apprentices.

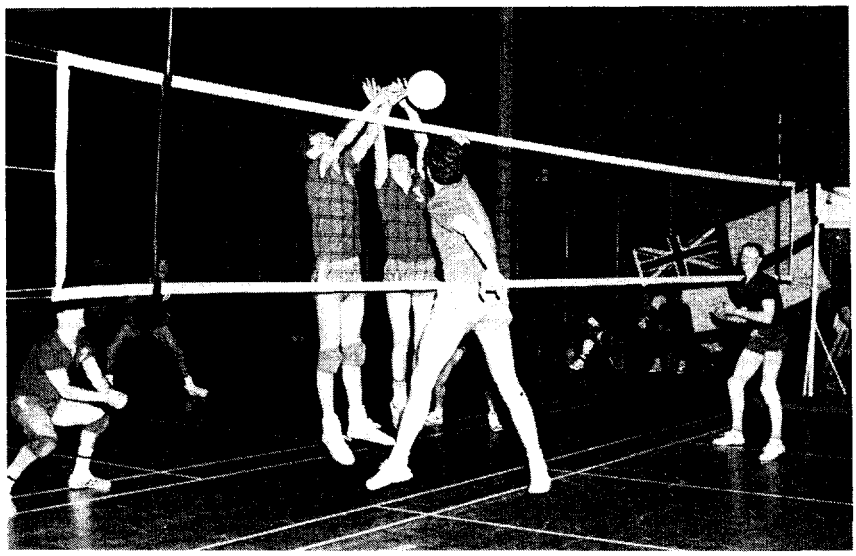

FIG. 10—THE LARGE AND WELL-EQUIPPED GYMNASIUM

FIG. 11—THE NAVAL AIR COMMAND MOUNTAIN CENTRE AT BETHESDA, NORTH WALES

FIG. 12—A YOUNG MECHANIC LEARNING THE EASY WAY DOWN A ROCK FACE

Compulsory resource and initiative training is included in most of the career courses. For this, the School administers and has the use of the Naval Air Command Mountain Centre at Bethesda in Snowdonia. The centre consists of two cottages and a number of outhouses which have been modernized and adapted to provide accommodation for forty men and women. Here trainees carry out a programme of hill walking, rock climbing, and canoeing under the eagle eyes of a team of highly qualified and enthusiastic instructors. To provide further variation, some classes are taken pot-holing in the Mendips or sailing from JSSC Hornet.

Senior classes of apprentices and mechanicians are given considerable latitude in the choice of their final expedition and some interesting exercises have resulted including sailing a wherry on the Norfolk Broads and restoration work in H.M.S. *Belfast*. Mechanicians undertake

community service in addition to resource and initiative training. Work undertaken covers a wide field from redecoration work for senior citizens to demolition and re-erection of buildings for the Chalk Pits Museum at Amberley near Arundel.

Results

Failure rates vary quite widely between the different courses but the current poor employment situation in civilian life has acted as a spur to the lazy. Among the basic trainees, the failure rate is 11 per cent. However, of these, 9 per cent. are re-categorized to other branches and only 2 per cent. leave the Service. On qualifying courses for leading and petty officer rates, the failure rate is 4 per cent. For apprentices, it is 5 per cent. and, for mechanicians, it is 3 per cent. Although a number withdraw voluntarily in the early part of the course, mechanicians are probably the best motivated of all courses. Although as many mechanician candidates as possible are required, great care is taken in their selection in order to ensure that they have a good chance of completing the course. Experience has shown that high failure rates tend further to increase the chance of failure of the weaker candidates.

Conclusion

The Air Engineering School, after more than a decade at H.M.S. *Daedalus,* is a thriving institution combining the best traditions of the separate Electrical and Mechanical Schools and at the same time, more importantly, developing traditions of its own.

The second decade has started with the challenge of EBD; new techniques and equipments keep the staff on their toes and the School looks forward to an interesting and rewarding future.

Editor's Note:

This article was written in June 1981 and does not reflect changes due to the eventual closure of H.M.S. *Fisgard* and reductions in manpower due to the Defence Review.