

ELLIOTT

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# ELLIOTT FLIGHT AUTOMATION

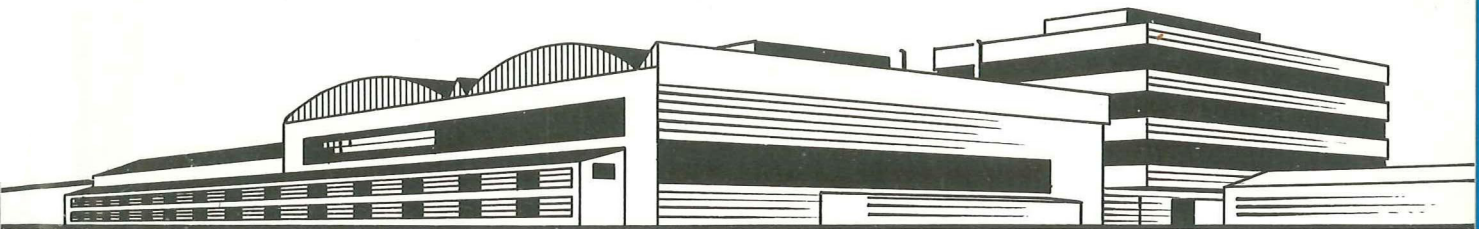
# PRODUCT SUPPORT



**ELLIOTT**

**AVIATION  
SERVICE  
& REPAIR  
DIVISION**

**SALES & SERVICES  
REPAIR AND SUPPLIES  
SATELLITE DEPOTS  
QUALITY SERVICE**





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REPAIR AND SUPPLIES

SATELLITE DEPOTS

QUALITY ASSURANCE

# INTRODUCTION

In our constant endeavours to improve our support services to customers we have re-organised our internal administrative arrangements in accordance with the information contained in this handbook. We have also considerably expanded our facilities in keeping with the growing business and need for ever faster response to customer problems and requirements.

In recognition of the importance and influence of effective product support on our customers' success in aviation and to our own company's progress in the future, the post of Support Manager has been established. This more powerful position entails a direct responsibility to the Board of Management of the Company for the planning and operation of all support services and activities affecting any Elliott Flight Automation airborne equipment. A wider explanation of the work undertaken by the Support Manager and the further organisational changes brought about by the establishment of this job are explained in the succeeding pages of this book.

The booklet itself is intended for use as a practical reference guide for Elliott customers into the product support organisation of Elliott Flight Automation and contains full information on direct means of communication for each of the specialist services provided. It is anticipated that regular use of the booklet will lead to more expeditious handling of customers' enquiries and will help in avoiding the delays which can occur when enquiries and/or orders are mis-directed.



F. H. Bevan  
Support Manager  
Elliott Flight Automation

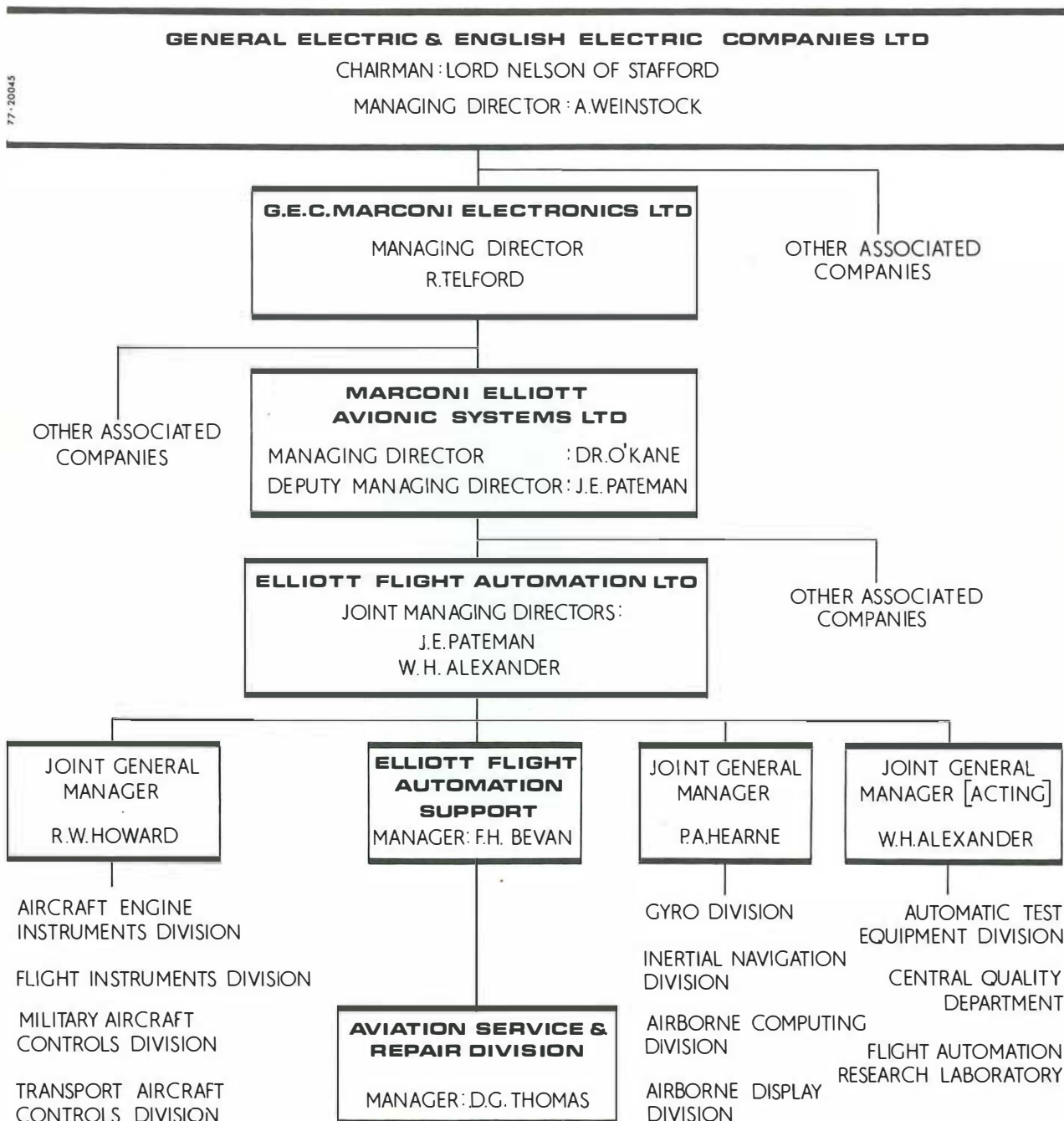
# COMPANY STRUCTURE

Following two United Kingdom industrial mergers since 1967 this company is grouped within the General Electric and English Electric Companies Ltd., one of the worlds five largest electrical equipment producers with an annual business volume exceeding £1 billion.

As a financial rationalisation of the G. E. C. and E. E. groups total activity Elliott Flight Automation

is associated with the Marconi Company but remains a self contained specialist Avionic Systems Manufacturing Company. Its Directors, Managers and Executives are those appointed by the original Elliott Automation holding Company most of whom have been with the company since the inception.

77-20045



**SALES & SERVICES**  
**REPAIR AND SUPPLIES**  
**SATELLITE DEPOTS**  
**QUALITY ASSURANCE**



# ELLIOTT FLIGHT AUTOMATION

Elliott Flight Automation trades under the name of Elliott Brothers (London) Limited which holds the contracts and orders on which Elliott Divisions work. It is based at the Airport Works, Rochester in the county of Kent, England and employs approximately 4,500 personnel. The range of products designed and produced by its component divisions for both combat and transport aircraft includes:

- Automatic Flight Control Systems
- Automatic Stabilisation Systems
- Automatic Landing Systems
- Auto Throttle Systems
- Air Data Systems
- Airspeed Indicators
- Altimeters
- Airborne Digital Computers
- Automatic Test Equipment

Computer Controlled Automatic Checkout Systems

Flight Director Computers

Fuel Flow and Fuel Content Measuring Equipment

General Support Test Equipment

High Precision Gyros

Head-Up Displays

Inertial Platforms

Mach Meters

A separate organisation within Elliott Flight Automation Limited is considered necessary to provide a comprehensive after-sales support service for these products directly to aircraft operators. This function is performed by Aviation Service and Repair Division, also based at the Airport Works, Rochester, Kent.

77-20046

## ELLIOTT FLIGHT AUTOMATION LTD.

JOINT MANAGING DIRECTORS (2)

JOINT GENERAL MANAGERS (2)

ASSISTANT GENERAL MANAGER

SUPPORT MANAGER

- AIRBORNE COMPUTING DIVISION
- AIRBORNE DISPLAY DIVISION
- AIRCRAFT ENGINE INSTRUMENTS DIVISION
- AUTOMATIC TEST EQUIPMENT DIVISION
- FLIGHT AUTOMATION RESEARCH LABORATORY
- FLIGHT INSTRUMENTS DIVISION
- GYRO DIVISION
- INERTIAL NAVIGATION DIVISION
- MILITARY AIRCRAFT CONTROLS DIVISION
- TRANSPORT AIRCRAFT CONTROLS DIVISION
- CENTRAL QUALITY DEPARTMENT

AVIATION SERVICE & REPAIR DIVISION

SALES & SERVICES

REPAIR AND SUPPLIES

SATELLITE DEPOTS

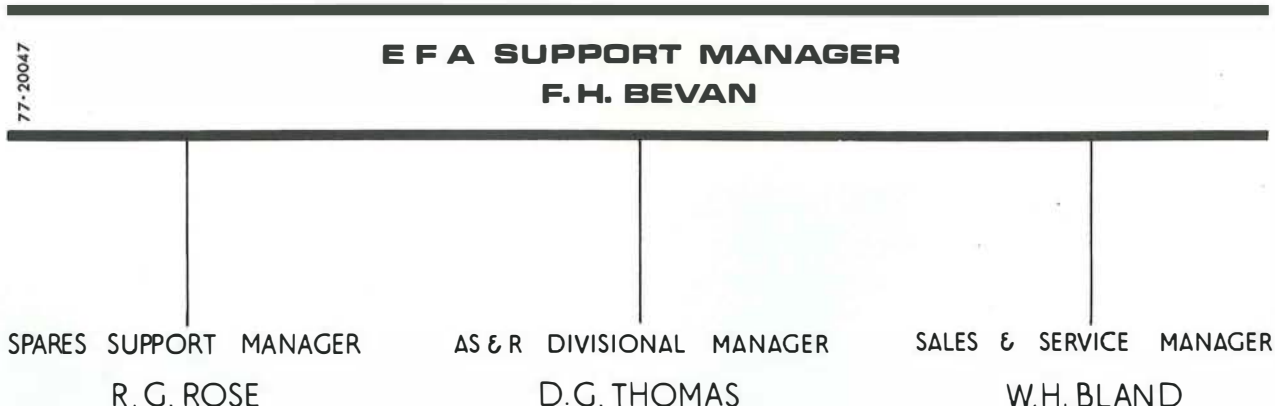
QUALITY ASSURANCE

# EFA SUPPORT FUNCTION

The world-wide support of Elliott aviation products is the responsibility of Mr. F. H. Bevan, Support Manager of Elliott Flight Automation.

He is responsible to the Managing Director for the total support activities of Elliott Flight Automation which includes the Aviation Service and Repair Division through its Divisional Manager Mr. D. G. Thomas. This entails inter alia the organisation of the arrangements for satisfying customers' requirements for the servicing and support of Elliott equipment in their aircraft ensuring that product support is given due consideration by the design and manufacturing divisions of Elliott Flight Automation.

In addition to Mr. D. G. Thomas, the Divisional Manager, Mr. Bevan is assisted by Mr. R. G. Rose, Spares Support Manager, on policy matters affecting the supply and distribution of equipment spares and on the planning and implementation of automatic data processing on an international basis.



Mr. W. H. Bland is the support organisation's Sales and Service Manager responsible to Mr. Bevan for the formulation and negotiation of sales and service policies in connection with customer requirements for procurement of spares and for repair and overhaul arrangements on a cost-per-hour, exchange or regular repair contract basis. When agreement is reached and a contract or order is placed, this then becomes the responsibility of the Aviation Service and Repair Division as the executive organisation to fulfil the requirements.

Mr. Bland is also responsible for the administration of the Company's team of technical representatives, service engineers and field working parties and for the technical training of customers' personnel.



SALES & SERVICE ENQUIRIES  
MEDWAY 44400 Ext. 60  
Telex 96211 EASUPPORT

The civil aviation representatives are controlled by the Field Service Manager (Civil), Mr. L. W. F. Stark. Representatives are normally made available for limited but adequate periods of time at customers' bases on the introduction of new aircraft fitted with Elliott equipment. Their functions are to advise aircrew, ground crew and management on the technical aspects of the equipment and to establish lines of communication between the customer and Aviation Service and Repair Division for whatever assistance may be required. They are also empowered to adjudicate on warranty arisings in most cases, commission special Elliott test equipment on site and carry out local training. Where constant coverage is required representatives are located at customers' main bases. Otherwise, regular visits are made to ensure continuous smooth operation and to acquaint customers with the latest information on equipment development. These services are also available "on call" in cases of difficulty either directly to the nearest known Elliott representative or to Mr. Stark at Rochester.

Elliott military equipment support planning is the responsibility of Mr. S. G. Baggott, Sales Manager (Military), who also controls the military field service representatives and the training school through Mr. J. P. Balfour (Field Service Manager, Military).

The technical services training school trains both customers' personnel and Elliott staff in the general theory, operation, maintenance or overhaul of equipment supplied by Elliott. At the end of each course an examination is held and a certificate of competence awarded to each successful candidate. In many cases the Elliott instruction is given as an integral part of the aircraft constructors' training schemes and at their facility. Where the requirement demands, training facilities are established at the customer's base, thus reducing the cost and inconvenience of the customers' staff being away from home. Instructors are qualified engineers with additional instruction training and are constantly endeavouring to devise and improve their techniques.

FIELD SERVICE ENQUIRIES  
MEDWAY 44400 Ext.74  
Telex 96211 EASUPPORT

TRAINING ENQUIRIES  
MEDWAY 44400 Ext. 74  
Telex 96211 EASUPPORT

**SALES & SERVICES**  
**REPAIR AND SUPPLIES**  
**SATELLITE DEPOTS**  
**QUALITY ASSURANCE**

# DIVISIONAL FUNCTION

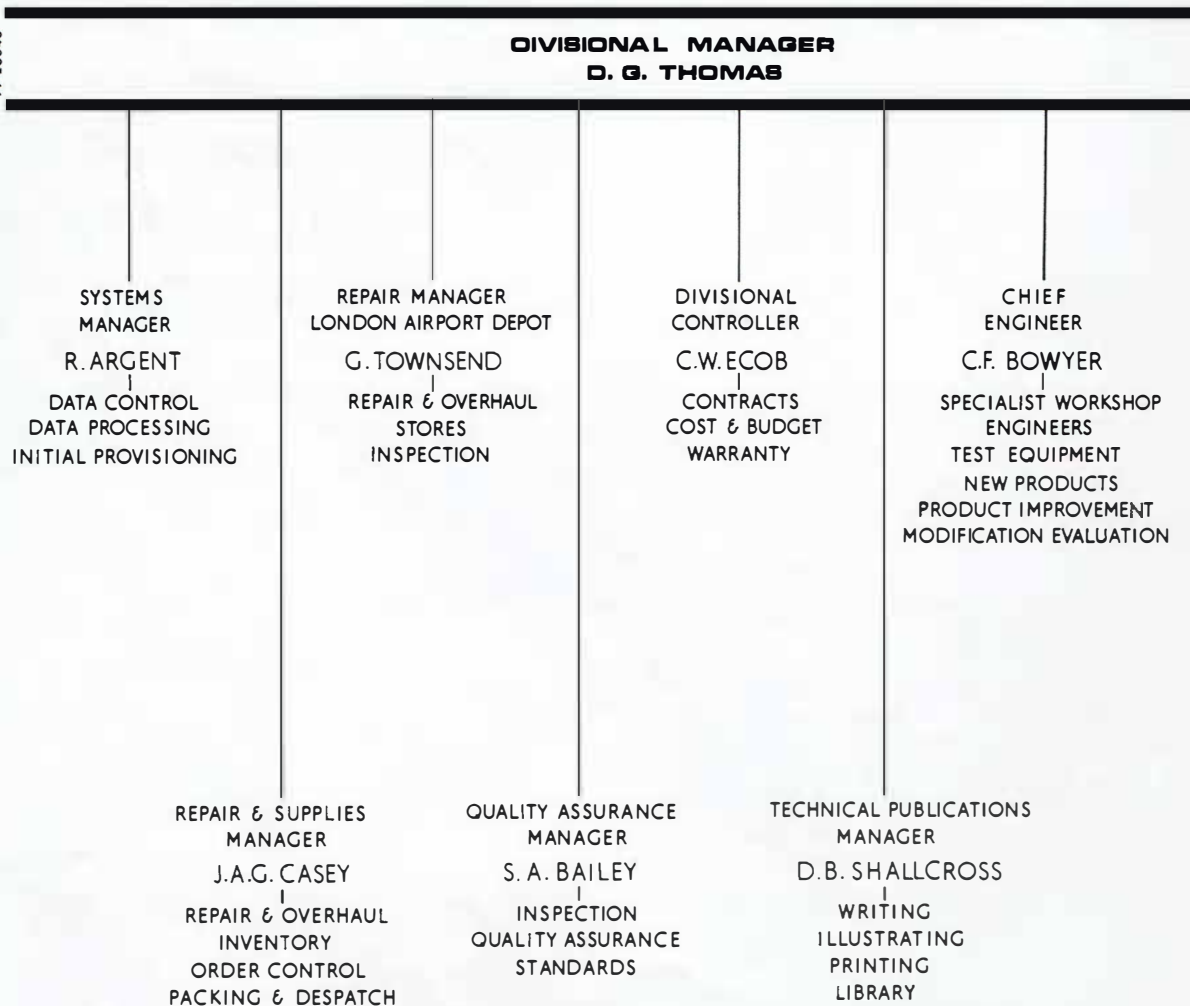
Aviation Service and Repair Division is managed by Mr. D. G. Thomas and is staffed by personnel selected both for their engineering ability and practical experience of support activities. The Division is well versed in the day-to-day running problems and needs of military services and airline operators and are bound by the disciplines of both military and civil specifications.

The Divisional Manager exercises control of the Division through a number of Departmental Managers, each of whom is responsible for a particular aspect of support, but all of whom are to a large extent inter-dependent and work in close co-operation. The Division employs approximately 370 people devoted entirely to the comprehensive support of Elliott Flight Automation products.

The broad range of Divisional responsibilities covers:-

- Repair and Overhaul
- Defect Investigations
- Supply of spare units, spare parts and special test equipment
- Warranty Administration
- Product Improvement
- Technical Publications
- Technical Records
- Catalogues
- Service Bulletins and Newsletters
- Inspection and Quality Assurance
- Engineering of Test Equipment

77-20048



# TECHNICAL PUBLICATIONS DEPT.

The Technical Publications Department under the management of Mr. D. B. Shallcross covers all aspects of writing, illustrating and production of comprehensive instruction manuals, parts lists, spare parts catalogues, reports, service bulletins and data leaflets. In addition, it is responsible for the distribution of publications, for maintaining a library of engineering drawings, specifications and technical manuals for use by the Division and for keeping the Division's technical records.

Publications are prepared and produced to the requirements of the Air Technical Publications Branch of the Ministry of Technology, the Air Registration Board, the Air Transport Association of America and to US Mil Specifications.

The Department works in close co-operation with the manufacturing divisions and with the Repair and Quality Assurance Departments of Aviation Service and Repair Division for validation of maintenance and overhaul instructions and with the Sales and Supplies Departments in compiling parts lists and catalogues.

Technical writers are integrated into the manufacturing divisions, where they work in collaboration with engineers in the production of technical manuals. A representative of Technical Publications attends all modifications meetings on behalf of the Division and is responsible for the rapid dissemination of information through service bulletins and leaflets.

Questions arising through service bulletin issues should be addressed to the Field Service Manager (Civil) or his field representative.

The Cataloguing Section is responsible for the production of illustrated parts lists to ATA 100 and ATA 200 and works in liaison with the Supplies Department in the production of commercial information for inclusion in catalogues and in maintaining and publishing stores inventories and price lists.

The Technical Publications Department has its own Drawing Office to provide illustrations for all publications requirements in the most effective and economic manner. The Department also has its own printing and photographic sections. Printing is by offset lithography and this document has been produced in-house by this method.

TECH. PUBLICATIONS ENQUIRIES  
MEDWAY 44433  
Telex 96211 EASUPPORT

## TECHNICAL PUBLICATIONS MANAGER O. B. SHALLCROSS

TECHNICAL  
MANUALS

PARTS  
CATALOGUES

ILLUSTRATING

PRINTING

LIBRARY

REPAIR AND SUPPLIES  
SATELLITE DEPOTS  
QUALITY ASSURANCE



77 20057

# REPAIR & SUPPLIES DEPARTMENT

This facility, under the management of Mr. J. A. G. Casey, is responsible for the combined functions of repair, overhaul and supply. It is organised such that the customers' interests are best served in both the repair of equipment and the supply of spares.

## THE REPAIR FACILITY

The repair facility is an "Approved Repair Station" under the regulations of the British Ministry of Defence, the Air Registration Board of the United Kingdom and the Federal Aviation Agency of the United States of America and is equipped to deal with the repair and overhaul of all types of electronic, electrical, electro-mechanical and mechanical equipment manufactured by divisions of Elliott Flight Automation Limited. Repair of gyroscopic and allied equipment is carried out in a super clean room, 1400 sq ft in area, built to FED STD 209 (Issue 1963).

In addition, this facility studies the repair and overhaul techniques to be applied to new equipment to ensure that the relevant technical publications comply with repair and overhaul requirements.

The manager of the repair facility is Mr. H. J. Bryan who controls a staff of 120 in an area of approximately 9,250 sq ft which includes the super clean room.

For expediting repair orders, reference should be made in the first instance to the production order officer who is responsible to Mr. Bryan.

### EQUIPMENT REPAIR ENQUIRIES

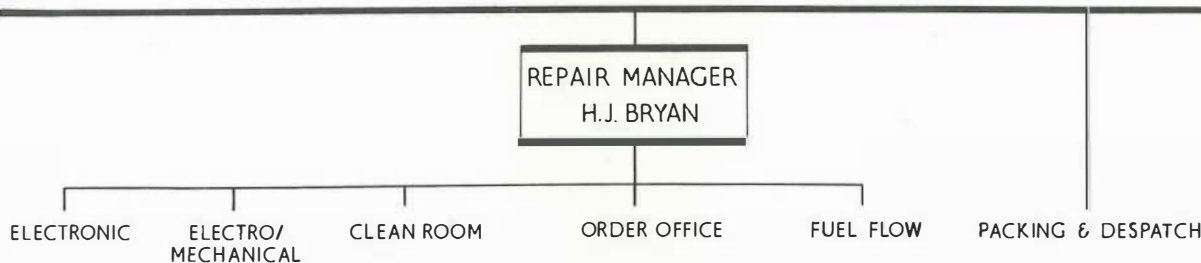
7.30am. to 5.30pm. MEDWAY 44400 Ext.267

5.30pm. to 7.30am. MEDWAY 42516

Telex 96211 EASUPPORT

77-20052

## REPAIR AND SUPPLIES MANAGER J. A. G. CASEY



## PACKAGING & DESPATCH

The Packaging and Despatch Department, under the control of the Despatch Manager, maintains a daily collection and delivery service within the UK. Transit time between customers and repair facilities are kept to a minimum by the operation of three vans based at Rochester and one van based at the London Airport Repair Facility.

To expedite Customs handling and flight sorting, special labels are used on equipment imported into or exported from the UK. These

labels, developed from close liaison between H. M. Customs and Elliott, have reduced transit delays by up to three weeks. Supplies of these special labels are given to each customer and further supplies are returned with each repair and on request.

Elliott shipping agents at London Airport are Messrs. Baxter Hoare. Use of this agency is strongly advised for overseas customers in order to avoid long customs delays.



## REPAIR AND SUPPLIES MANAGER J. A.G. CASEY

INVENTORY MANAGER  
W.S.ANDREWS

PURCHASING  
VALUE ANALYSIS  
STOCK CONTROL  
STORES  
TECHNICAL RECORDS  
DATA COLLECTION  
ADVANCE PURCHASING

CONTROL SUPERVISOR  
J. HENLEY

ORDER ADMINISTRATION  
  
CUSTOMER EXPEDITE  
  
INVOICING  
  
TELEX

### INVENTORY MANAGEMENT

The Inventory Management Department under the supervision of Mr. W. Andrews is responsible for stock control, logistics, stores, value analysis and buying.

The logistics and stock control organisation is responsible for producing provisioning information and for maintaining spares levels in accordance with expected requirements.

Pre-provisioning of spare parts is carried out in collaboration with the manufacturing division either during the development phase or during the early production stages of equipment. Pre-provisioning absorbs such parameters as failure rates, mean time between failures, mean time between overhauls and the time and rate at which equipment goes into service. All pre-provisioning is being controlled by an integrated data processing system. This ensures that spare parts, required for the servicing of Elliott equipment either by customers or the Division's repair facility, will be available in accordance with the lead times as stated in Elliott catalogues. The data processing system employed allows full integration of stock management with the civil airlines ATA 200 system and is the same as that which is currently in use with the British Aircraft Corporation Inc. at Arlington, Virginia, USA. This is a proven system of operation which has been highly successful over many years and is directly applicable to the problems of provisioning control and distribution faced by Aviation Service and Repair Division.

The Buying and Value Analysis organisation ensures that the spares are procured at the most economical level.

There is close co-operation between the Inventory Management Department and the Technical Publications Department in the production of catalogues of spare parts to the requirements of ATA Specification 200.

### THE SUPPLIES FACILITY

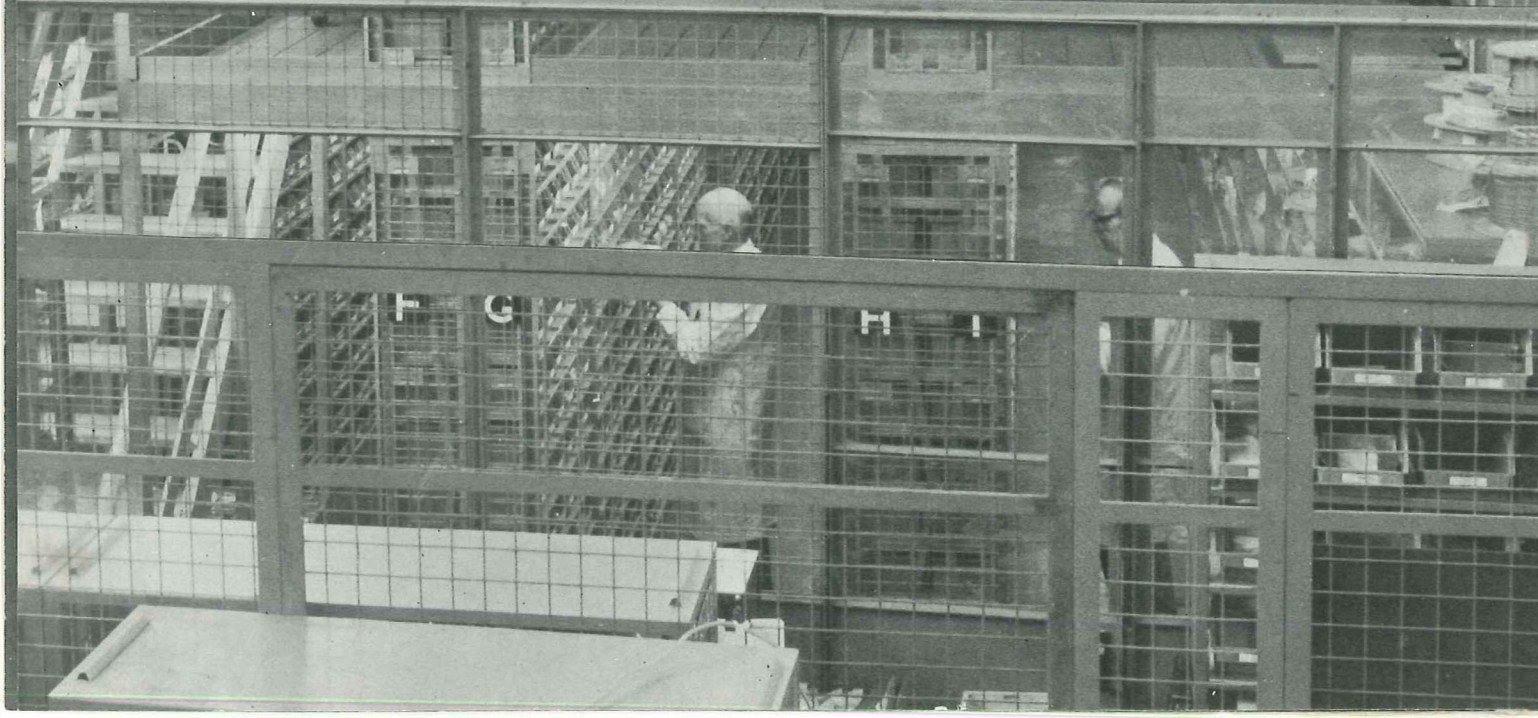
The Supplies facility consists of Order Control and Inventory Management sections and both are controlled through their respective section heads by the Repair and Supplies Manager.

Order Processing, technical vetting etc. The Order Control section under the supervision of Mr. J. Henley, is responsible for actioning all customers hardware orders and for ensuring that delivery requirements are met. Initial and progress enquiries for piece parts and units are directed to his office.

Customers' orders will be acknowledged immediately after they have been technically vetted to ensure that no typographical errors have been transmitted. In any case, they will be acknowledged within ten days of receipt. In cases where for some special reason Elliott will be unable to meet previous agreed shipping dates, the customer will be informed immediately this becomes known.

Within the Order Control Department there are expeditors responsible for the general administration of customers' orders. Special expediting action is taken in the case of AOG orders which are dealt with within four hours. Other emergency orders will be shipped within twenty-four hours and out-of-stock items within seven days, provided that the items have not been covered by special lead-in time conditions of which the customers are aware.

SPARES EXPEDITING  
MEDWAY 44400 Ext.268  
Telex 96211 EASUPPORT



# THE STORES

As an integral part of the computerised Inventory Management System and due to the greatly increased activity of aviation business, it has been necessary to enlarge and re-organise the stores area. The divisional store now covers an area of 2,268 sq ft and stocks approximately 34,000 items. It is laid out such that every stores item is suitably coded to enable its description, value and location to be recognised by the computer.

In a separate section are held the complete units which are used as replacements for exchange schemes and for AOG purposes.

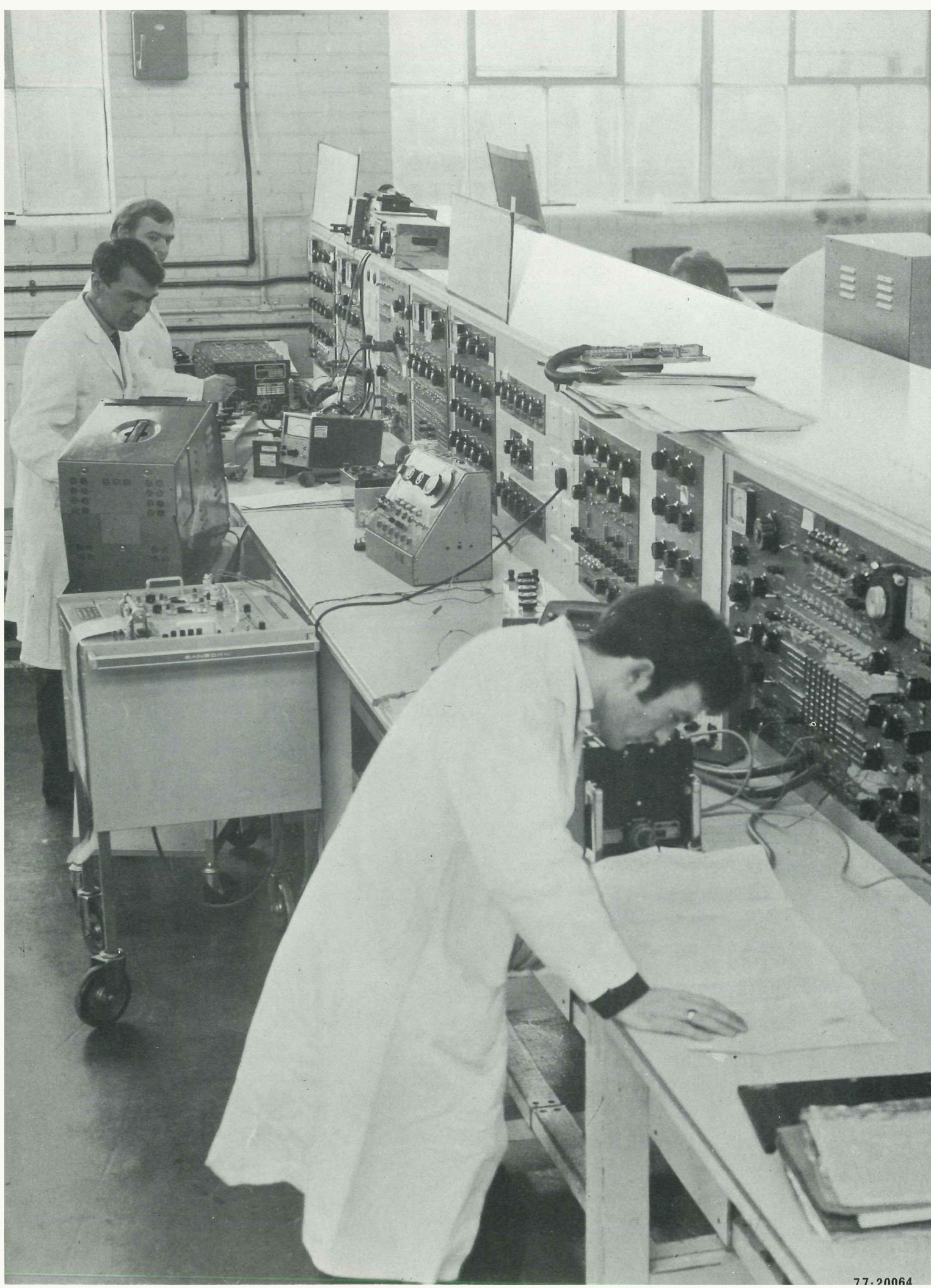
In the interests of efficient use of capital and hardware resources the Rochester centre acts as a mother store supplying satellite stores such as the London Airport Depot, British Aircraft Corporation, Arlington, Elliott Automation, Atlanta, and other depots which may be set up throughout the world. By this means optimum use is made of the investment in hardware and pressure for supplies on satellite stores can be quickly relieved from the Division's main inventory.

The image displays four overlapping forms from the ATA SPEC 200 series, which are used for inventory and procurement management. The forms are tilted and layered, showing different sections of the data entry process.

- Top Form (ATA SPEC 200 FORM 200-12A (APR 15/64))**: This form includes fields for TRANSACTION, SUPPLIER, CATALOG SEQUENCE, PART NUMBER, and REMARKS. It also has a section for CUSTOMER USE.
- Middle Form (ATA SPEC 200 FORM 200-12B (APR 15/64))**: This form features fields for TRANSACTION, SUPPLIER, CATALOG SEQUENCE, PART NUMBER, and REMARKS. It includes a section for PROVISIONING PROCEDURE DATA CARD.
- Bottom Left Form (ATA SPEC 200 FORM 200-11A (APR 15/64))**: This form contains fields for TRANSACTION, SUPPLIER, CATALOG SEQUENCE, PART NUMBER, and REMARKS. It has a section for PROVISIONING TECHNICAL DATA CARD.
- Bottom Right Form (ATA SPEC 200 FORM 200-11B (APR 15/64))**: This form includes fields for TRANSACTION, SUPPLIER, CATALOG SEQUENCE, PART NUMBER, and REMARKS. It has a section for PROVISIONING DESCRIPTIVE DATA CARD.

The forms are designed to capture detailed information about inventory items, including their location, value, and description, for use in a computerised system.

SATELLITE DEPOTS  
QUALITY ASSURANCE



# FINANCIAL CONTROL DEPT.

The Division, in operating the support services for all of Elliott Flight Automation Airborne equipment, remains a valuable business in its own right and the separation of the support function from that of design and manufacture allows a clear cut distinction in administration of the separate costs. It is Mr. C. W. Ecobs' function as Divisional Controller to administrate two sections of the division so as to control the finances of the operation.

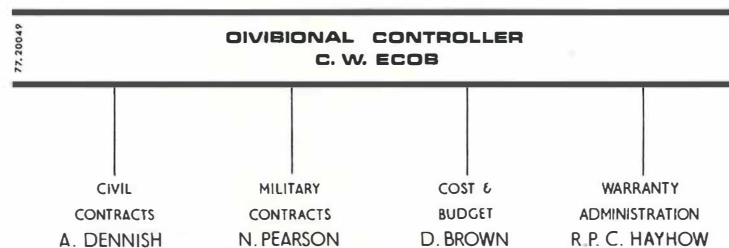
(a) Budget and cost section

(b) Control management section

The Company uses a highly advanced system of budgetary control by virtue of its separate divisions and it is the task of the Divisional Budget and Cost Officer to formulate plans for each fiscal year. He thus subsequently monitors the financial performance of the division on a continuous basis.

Control and administration of the Division's support contracts is separated between two contracts managers, Mr. N. Pearson for military contracts and Mr. A. Dennish for civil contracts. This has been found necessary owing to the high volume of business and the quite distinct differences in the methods of operation and control that exist. This leads to the need for contract managers with a specialised knowledge of their respective customers. The Division handles contracts from many governments and many airlines throughout the world and these vary from 'fixed cost per hour' maintenance contracts to exchange contracts and ad hoc repair orders together with hardware orders of widely varying values.

The administration of warranty claims is also dealt with in this department.

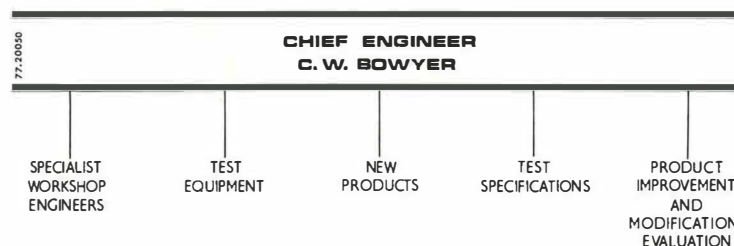


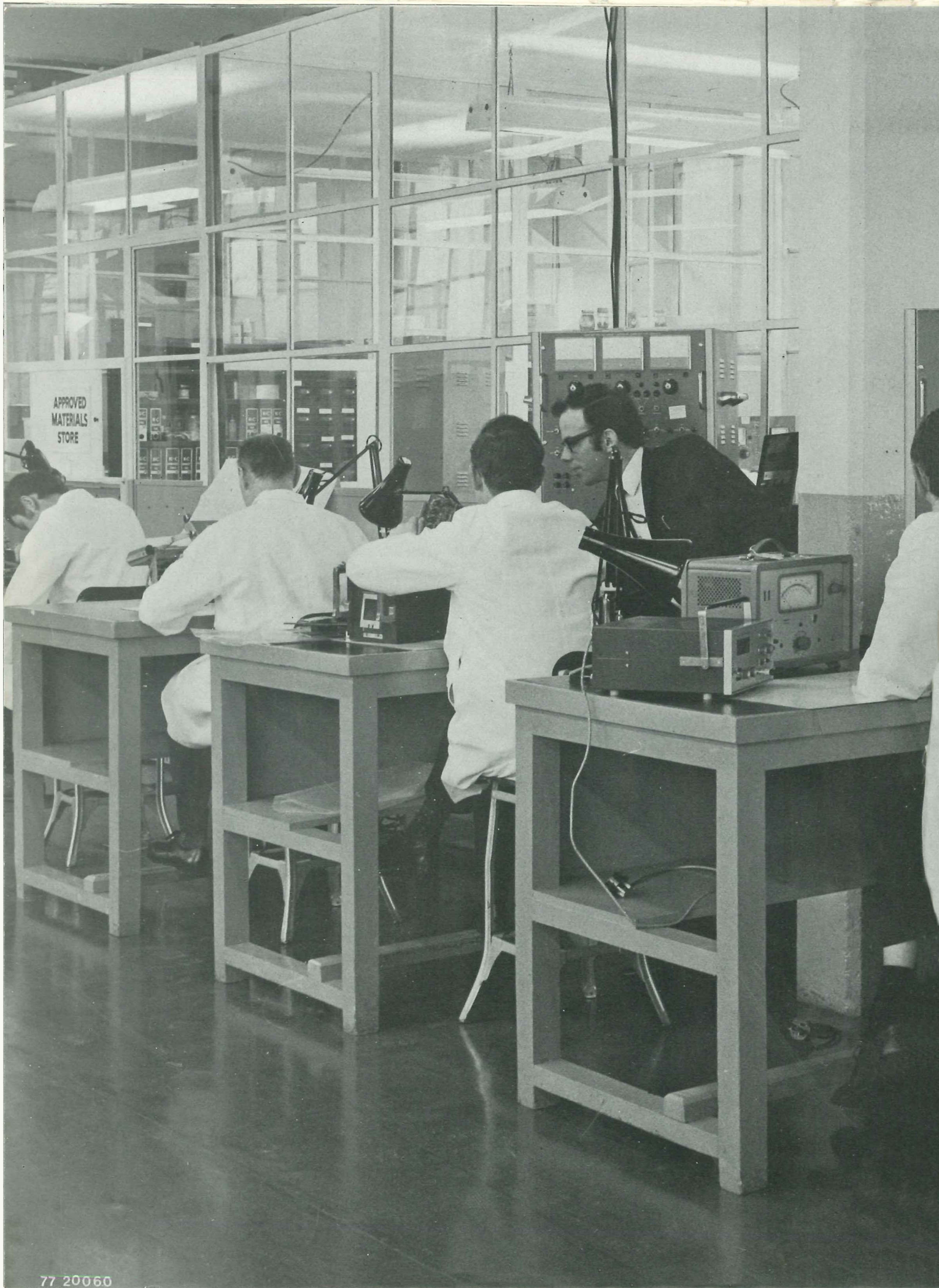
# ENGINEERING DEPT.

The Engineering Department, under the management of the Chief Engineer, Mr. C. W. Bowyer, is responsible for all engineering interface between the manufacturing division of Elliott and the workshops of this Division.

This department is staffed by qualified engineering personnel who undergo periods of re-training in the manufacturing division whenever new projects are developed. These engineers introduce the new equipments and new repair techniques to the workshop personnel and are also responsible within the division for full information on changes and modifications to existing equipment. Engineers and Technical Assistants are allocated to the various specified groups of the workshop for technical advice. In addition, in our customers interests, this department provides an invaluable product improvement service with the aims of better maintainability and higher reliability of Elliott products.

It is also the Department's responsibility to ensure that the correct standard of test equipment is used and maintained in the workshops and that special-to-type test equipment for new products is available to the Division and customers at the correct time.





# THE LONDON AIRPORT FACILITY

The present facility is a subsidiary of the Divisions main centre of activity at Rochester and is situated at Bay 'B', 5th Floor, Enterprise House, Blyth Road, Hayes, Middlesex under the management of Mr. G. B. Townsend. It is an "Approved Repair Station" under the regulation of the Air Registration Board of the United Kingdom and Federal Aviation Agency of the United States of America.

The Facility occupies an area of 3250 sq ft and is equipped for, and effects the repair and overhaul of the autopilots and some of the flow meters fitted to the BAC One-Eleven aircraft operated by many of the world's airlines. It is intended to expand this facility into a much larger depot to meet the future demands of new aircraft such as Concorde. To this end more suitable sites within the London Airport area are currently being evaluated.

The Facility is backed by the years of experience gained by the parent organisation and will eventually provide similar full support, thus allowing Elliott to offer to the airlines at London Airport the quicker response that they require and expect for present and future civil aircraft.

Quality assurance and inspection functions are performed within the Facility but are controlled from the Divisional Quality Assurance Department at Rochester.

The store operates as a satellite of the Rochester store, thereby achieving a more efficient utilisation of the investment in spares hardware.



EQUIPMENT REPAIR ENQUIRIES  
8.15 a.m. to 4.45 p.m. OI-573-5796  
4.45 p.m. to 8.15 a.m. MEDWAY 42516



# THE ATLANTA USA FACILITY

The support of Elliott Flight Automation products in the United States of America is centred on our associated company E-A Industrial Corporation of Atlanta, Georgia. The support activities of this Corporation have been developed on identical lines to the Elliott Flight Automation Support Organisation. Under the management of Mr. R. Shipp this facility is at present providing support for the Lockheed C-5A, Ling Temco Vought A-7 etc. Expansion plans are in progress to provide support in the United States for the Concorde.

Spares are stocked at this location for Elliott flowmeters fitted to the Fokker F.28 aircraft, and this service will be extended to other equipment as the market grows.

Company representatives based in the United States may be contacted through this office.

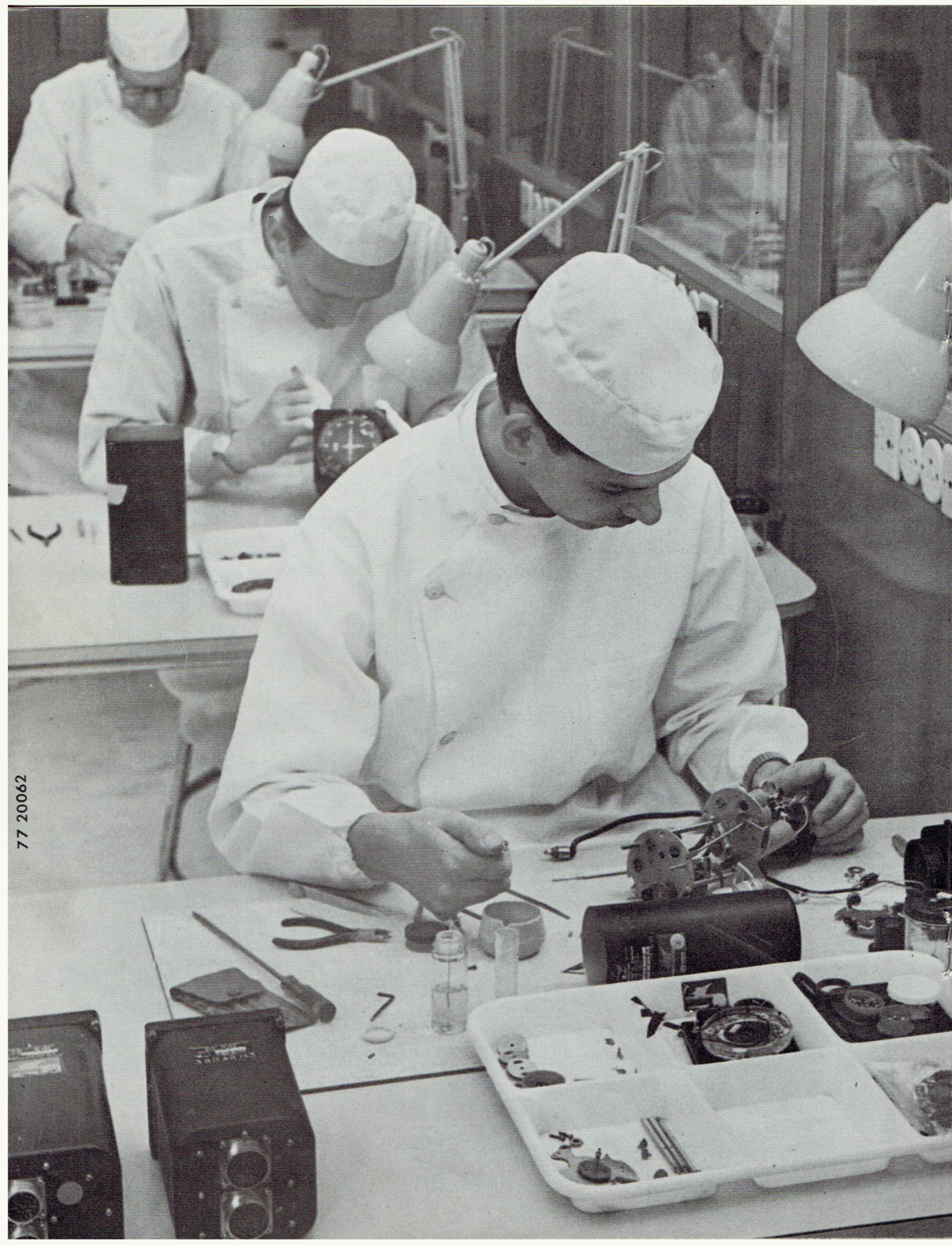
Spares for Elliott equipment fitted to the BAC 1-11 aircraft are obtainable from BAC Inc. Arlington, Virginia.



**FUTURE SUPPORT PLAN**

ATLANTA CONTACT  
Telephone 404 451-9103  
Telex 542232

77 20062



# THE QUALITY ASSURANCE DEPT.

The primary function of the divisional Quality Assurance Department is to ensure that all consigned equipments conform to the required specification standards of design, material and workmanship. This applies equally to supplies of spare parts as well as to unit repair. This function is not limited to factory activities only, but is extended as an integral part of field services on site.

The department manager is Mr. S. F. Bailey and the organisation is approved by the Air Registration Board and the United Kingdom Director General of Inspection and, through the Air Registration Board, the US Federal Aviation Administration.

Within the department, a major quality assurance function is performed by the collection and collation of statistics from customers and the Repair and Supplies facility. This information is fed back for action by the manufacturing divisions and the Aviation Service and Repair Division as necessary, with recommendations for component changes, further development or re-design as necessary.

When a unit is returned for factory repair, inspection is maintained from reception to consignment in the form of a three part schedule -

- (1) Function test and fault analysis
- (2) Component part detailed examination
- (3) Re-assembly, modification action and final tests

Continuity of control in quality standard is thus ensured and the appropriate reports are issued to a central quality control organisation which maintains a statistical service for all divisions of Elliott Flight Automation Limited.

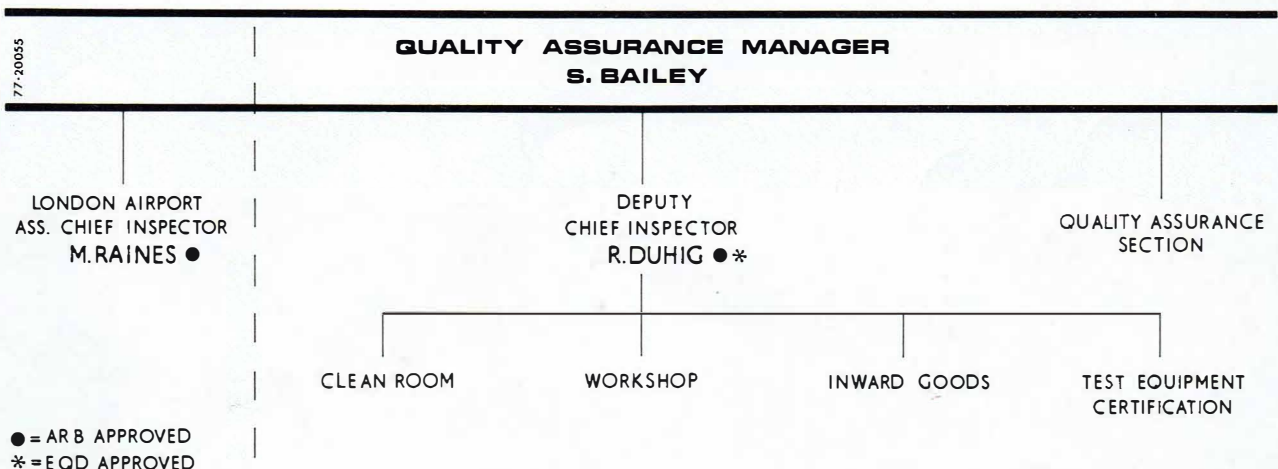
Routine certification of test equipment used in the Repair facility ensures proper and accurate functioning of all test facilities, in accordance with the requirements of the United Kingdom and US Government Inspection Authorities.

This Department is responsible for equipment defect warranty investigations and for raising the necessary reports to the customer, the Elliott Central Quality Control organization and the Division's Warranty Administration.

The Department is the authority behind the Approval given to Elliott field representatives for on-site inspection. It is also responsible for all quality assurance matters pertaining to repair stations such as the Elliott London Airport Facility.

In addition, this department ensures that the standard of test equipment for all products is maintained on a regular basis and certified as such.

QUALITY ASSURANCE ENQUIRIES  
MEDWAY 44400 Ext.15  
Telex 96211 EASUPPORT



**ELLIOTT**

**AVIATION SERVICE & REPAIR DIVISION**

**ELLIOTT FLIGHT AUTOMATION LIMITED**

Airport Works · Rochester · Kent · England

Telephone Medway(STD0634)44400

Telex 96333

A Member of Marconi-Elliott Avionic Systems Limited