



Nose sections of B.O.A.C.'s Britannia 310s coming out of the jigs.

## CONTRIBUTORS TO THE BRITANNIA...

carpets; Flexo Plywood Industries, Ltd., furnishings; Flight Refuelling, Ltd., pipe connections, valves; The General Electric Co., Ltd., fans, reading lamps, water heaters, ovens, humidifiers; Sir George Godfrey and Partners, Ltd., air conditioning; Gravier Manufacturing Co., Ltd., fire extinguishers; The Hairlok Co., Ltd., cushions; John Hall, Ltd., key rings; Hall and Hall, Ltd., rubber; Harley Aircraft Landing Lamps, landing lamps; Thos. P. Headland, Ltd., fasteners, grommets, springs; Hellermann, Ltd., plugs, bungs, sleeves; High Pressure Components, Ltd., split collars; Marcus H. Hodges and Sons (Engineers), Ltd., ground equipment.

Imperial Chemical Industries, Ltd., plastics; India Rubber Gutta Percha Co., rubber extrusions; Ironside Engineering Co., Ltd., ground equipment; Johnson and Phillips, Ltd., suppressors; Kellett Woodman and Co., wool; Kelston Engineering Co., Ltd., ground equipment; King Aircraft Corp., fasteners, straps; Laidlow and Ettrup, Ltd., circuit breakers; Latex Upholstery, Ltd., cushions, etc.; Leathercloth Co., Ltd., fabric; Luxram Electric, Ltd., filament; William Mallinson and Co., Ltd., panels; Marconi's Wireless Telegraph Co., Ltd., radio equipment; Marston Excelsior, Ltd., air-conditioning coolers; Midland Aeroequipment, Ltd., door locks; Mills Equipment Co., Ltd., shoulder harness; Mollart Engineering Co., Ltd., universal joints; Harold Moore and Sons, Ltd., plastics; Moulded Components (Jablo), Ltd., Aerojablex.

Negretti and Zambra, Ltd., pressure indicators; Normalair, Ltd., air conditioning; Norstel, Ltd., ground equipment; Northern Rubber Co., Ltd., rubber mouldings and extrusion; Oddie, Bradbury and Cull, Ltd., fasteners; Old Bleach Linen Co., Ltd., curtains; Partridge Transformers, Ltd., transformers; Peradin and Watercraft, Ltd., rubber parts; Phillips Electrical, Ltd., lamps, valves; Pianoforte Supplies, Ltd., hinges; Plessey Co., Ltd., sockets, plugs, fuse holders; R. B. Pullin and Co., Ltd., switches, relays; Pulsometer Engineering Co., Ltd., toilet pumps; Pyrene, Ltd., extinguishers, smoke detectors.

Redifon, Ltd., public-address system; Renown Springs, Ltd., springs and clips; Rotax, Ltd., electrical systems; Rotol, Ltd., gearboxes; Geo. Salter and Co., Ltd., springs and clips; Sangamo Weston, Ltd., instruments; Saunders Valve Co., Ltd., cocks and valves, especially water system; Self-Priming Pump and Engineering Co., Ltd., pumps, non-return valves; Siebe Gorman and Co., Ltd., cylinders, filters; Simmonds Aerocessories, Ltd., Pacitor gauge equipment; Skeldings, Ltd., springs and clips; Smiths Aircraft Instruments, Ltd., autopilot and instruments; Spaulings, Ltd., plastic mouldings; George Spencer Moulton and Co., Ltd., rubber; Sperry Gyroscope Co., Ltd., artificial horizon, gyro compass; Standard Telephones and Cables, Ltd., wireless.

Taskers, Ltd., ground equipment; Tecalemit, Ltd., adaptors, lubricating equipment; Teddington Aircraft Controls, Ltd., air conditioning control equipment; Teleflex Products, Ltd., remote-control mechanism; Telegraph Condenser Co., Ltd., capacitors; Tenaplas, Ltd., plastic mouldings; Herbert Terry and Sons, Ltd., clips; Thermal Control Co., Ltd., control units; Thermo-Plastics, Ltd., glasscloth; Thorn Electrical Industries, Ltd., filaments, lamps; Ronald Trist and Co., Ltd., rubber sealing rings, etc.

Ultra Electric, Ltd., throttle controls, intercom; Varley Dry Accumulators, Ltd., batteries; Vickers-Armstrongs (Aircraft), Ltd., cocks and seats; James Walker and Co., Ltd., washers, sealing rings, etc.; Wallington, Weston and Co., Ltd., rubber seals, etc.; West Bromwich Spring Co., Ltd., springs; Westinghouse Brake and Signal Co., Ltd., rectifiers; Whitby and Chandler, Ltd., rubber mouldings; W. H. Wilcox and Co., Ltd., universal joints; W. J. Wild, Ltd., shims; Wilkinson Rubber Linatex, Ltd., rubber sealing strip and seals.

### ENGINES

**Materials, Components, Accessories and Details.**—Accles and Pollock, Ltd., steel tubing, stainless steel elbows; Aeroplane and Motor Aluminium Castings, Ltd., light-alloy and zirconium castings; Aipite Products, Ltd., joint washers; Alvis, Ltd., light-alloy castings; Andre Rubber Co., Ltd., washers; George Angus and Co., Ltd., seals; Anti-Arrition Metal Co., Ltd., bronze housings; B.R.D. Co., Ltd., blades (finished); B.S.A., Ltd., precision castings; Belling and Lee, Ltd., terminal blocks; Bell's Asbestos and Engineering, Ltd., dumbbell-section tape; Birmetals, Ltd., Duralumin bar; Birmingham Aluminium Casting (1903) Co., Ltd., light-alloy castings and magnesium-zirconium castings; Thomas Bolton and Sons, Ltd., aluminium-bronze housings; James Booth and Co., Ltd., Duralumin bar; British Insulated Callenders Cables, Ltd., cables; British Thomson-Houston Co., Ltd., booster coils; David Brown Foundries Co., stainless-steel castings; Brown Bayley Steels, Ltd., steel forgings, stainless steel bar; Brown Brothers (Aircraft), Ltd., nuts; Bruntons, Ltd., alloy steel bar; C.W.C. Equipment, Ltd., Reglo switches.

C. G. Carlisle and Co., Ltd., stainless bar; Charles Churchill and Co., Ltd., screws; Clyde Alloy Steel Co., Ltd., steel bar (alloy); Coopers

Mechanical Joints, Ltd., washers, shims; Cornercroft, Ltd., blank units; de Havilland Propellers, Ltd., propeller controller units, actuators, locator assembly; Diamond Screw and Cotter Co., Ltd., taper pins; Daniel Doncaster, Ltd., steel stampings and blade forgings; Dowty Equipment, Ltd., seals, hydraulic damper and Downic switch; English Steel Corporation, Ltd., steel stampings, alloy steel bar; Evered and Co., Ltd., plugs; Ferodo, Ltd., brake lining.

Firth-Derihon Stampings, Ltd., steel drop forgings, turbine blade forgings; Thomas Firth and John Brown, Ltd., alloy steel bar and forgings; Firth Vickers Stainless Steels, Ltd., stainless-steel bar and castings; Samuel Fox and Co., Ltd., alloy steel bar; Garringtons, Ltd., blade forgings; Govan Shafting and Engineering Co., steel bar; Hadfields, Ltd., precision castings; Hall and Pickles, Ltd., alloy steel bar; John Harper and Co., Ltd., Meehanite castings; Hellermann, Ltd., Helsyn sleeves; Henley's Telegraph Works Co., Ltd., cables; High Duty Alloys, Ltd., light-alloy stampings, blade forgings and Dural bar; High Pressure Components, Ltd., collet nuts; Hoyt Metal Co., of Great Britain, Ltd., whitemetal; Hughes-Johnson Stampings, Ltd., steel stampings.

Imperial Chemical Industries, Ltd., light-alloy and brass bar; Iso-speedic Co., Ltd., centrifugal switches; William Jessop and Sons, Ltd., special alloy forgings; K.L.G. Sparking Plugs, Ltd., two-pin fireproof plugs; Kayser, Ellison and Co., Ltd., alloy steel bar; King Aircraft Corporation, clamps; Richard Kinger, Ltd., washers; J. H. Lavender and Co., Ltd., light-alloy castings; Light Metal Forgings, Ltd., light-alloy stampings and blade forgings; Lodge Plugs, Ltd., gland nuts, etc., ferrules, elbows, igniter plugs; London Electric Wire Co. and Smiths, Ltd., cables; Joseph Lucas (Gas Turbine Equipment), Ltd., bleed-valve assembly, burner assembly, fuel pump, fuel control unit, combined control unit.

M.A.M. Rubber Manufacturing Co., Ltd., cable sleeves; Manganese Bronze and Brass Co., Ltd., bronze bushes; McKechnie Bros., Ltd., brass bar; Measuring Instruments (Pullin), Ltd., switch; Metalastik, Ltd., rubber bushes; Metal Gravure Co., Ltd., nameplate; William Mills, Ltd., sand and aluminium-die castings; Negretti and Zambra, Ltd., pressure switches; Northern Aluminium Co., Ltd., Duralumin bar; Perry Barr Metal Co., Ltd., light-alloy castings; Plessey Co., Ltd., manufactured booster pumps, non-return valves, actuators, plugs and sockets, etc.; Precision Rubbers, Ltd., seals; Premier Spring Co., Ltd., spring.

Ransome and Marles Bearing Co., Ltd., bearings; Reynolds Tube Co., Ltd., steel tubings; William Robertson, Ltd., non-alloy steel bar; J. Rodgers and Sons, Ltd., blade stampings; Rotax, Ltd., linear actuator electric starter, terminal covers; Rotol, Ltd., tachometer, alternator, gearbox drive shaft; Rubery Owen and Co., Ltd., screws; George Salter and Co., Ltd., circlip, spring washers.

Sangamo Weston, Ltd., thermo-bulbs, leads, tachometer generators; Sheepbridge Steel Castings, Ltd., stainless-steel castings; Siegrist Orel, Ltd., cable markers and insulating sleeves; Small and Parkes, Ltd., cable straps; Smiths Aircraft Instruments, Ltd., transmitter, igniter plug, generators; Smith-Clayton Forge, Ltd., steel stampings; South Wales Forgemasters, Ltd., steel forgings; George Spencer Moulton and Co., Ltd., joint rings, rubber sleeving, extruded rubber section, synthetic rubber sleeves; Stainless Steel Wire Co., Ltd., stainless wire; Stampings Alliance, Ltd., steel stampings; Standard Telephones and Cables, Ltd., thermister pellets, suppressors and chokes; Sterling Metals, Ltd., magnesium/zirconium castings and aluminium castings; J. Stone and Co., Ltd., magnesium/zirconium castings and aluminium castings.

T. I. Aluminium, Ltd., light-alloy bar; Teddington Aircraft Controls, Ltd., flamestats, ductstats; Herbert Terry and Sons, Ltd., hose clips; Thermal Control Co., Ltd., thermocouples; Tubes, Ltd., steel tubing and shaft forging; G. Turton Platts, steel stampings; Ultra Electric, Ltd., throttle motor; Vokes, Ltd., oil filter assembly; James Walker and Sons, Ltd., packing rings; Wellworthy, Ltd., retaining rings and gas rings; Henry Wiggin and Co., Ltd., Nimonic steel bar; W. J. Wild, Ltd., tab-washers; Yorkshire Engineering Supplies, Ltd., bronze bushes, housings, etc.

### AN ADDITIONAL LIST

**A**PART from the many firms named above, in lists supplied by the manufacturers of the aircraft, we understand that the following have also supplied production materials, components, etc., or have provided equipment specified by B.O.A.C. for their Britannia operations:—

Abbey Panel and Sheet Metal Co., Ltd., prototype main engine cowling, production rear cowlings, and door assemblies, etc.; Aviation Developments, Ltd., special rivets, quick-release pins, etc.; Baynes Aircraft Interiors, Ltd., design of cabin furnishings and associated structures; British Oxygen Aro Equipment, Ltd., oxygen demand regulators specified by B.O.A.C.; Chelton Electrostatics, Ltd., aerial equipment; British Vapour Blast, Ltd., "Hydrabrasion" de-scaling process for titanium tailpipe shrouds; Delaney-Gallay, Ltd., wing de-icing heat-exchangers; Equator Wheels and Sections, Ltd., titanium and nimonic stiffening bands for Proteus 755; H.M.L. (Engineering), Ltd., hydrostatic test rig and mobile test rig; Helliwells, Ltd., ducting, sleeping-berth frames, luggage racks, etc.; Integral, Ltd., hydraulic motor-pump for feel simulator; Intermetric Processes, Ltd., processing of first titanium shrouds for Proteus; N.S.F., Ltd., switches in propeller control units; D. Napier and Son, Ltd., Spraymat anti-icing equipment; The Palmer Tyre, Ltd., oxygen reducing valve installation; R. B. Pullin and Co., Ltd., turn-and-slip indicator to B.O.A.C. specification (see also list above); Pyrene Co., Ltd., Bonderite "S.S." used in cold forming of flame-tubes (see also list above); Scott Bader and Co., Ltd., "Crystic" and "Marco" polyesters; Spa Guilds, Ltd., manufacture of engine components; Western Manufacturing (Reading), Ltd., control-column stall-warning device; Williams and James (Engineers), Ltd., ground air compressor supplied to B.O.A.C. for ground servicing Britannia hydraulic accumulators.