PART 1 GLIDER AIRWORTHINESS 'AGGRO' (Please add to pink list)

1.1 Diamants 16.5 and 18M

Owners have been sent direct, Service Bulletin 06 (attached), requiring Inspection of Bonding in the Wing, and restriction of Vne.

1.2 WA 30 'BIJAVE'

Service Bulletin 02 (attached) requires inspection for cracks. (None so far in U.K. cracked or otherwise). (CAA).

1.3 SD3 1ST. (May also apply to BG 135 series?).

Slippage of rudder cable stop clamps allowed excessive rudder travel, and jamming between rudder and fin shroud. Fit double clamps if necessary. (Blackpool and Fylde G.C.)

1.4 Cable Release Controls. (L-Spatz and all glider types).

Where two hooks are installed a SINGLE Release Control must be provided. (BCAR Section E4-2 para 4.3.2. refers). (BGA Accident Report).

1.5 Cable Release - Maximum Operating Loads.

O.S.T.I.V. para 4.622 states 'The release force shall not exceed 20 kgf (44 lbs), when loaded throughout the range from zero to the limit loads. (B.C.A.R. Section E4 - 4.3.4 requires not less than 5 lbs, and not exceeding 30 lbs).

Periodic checks should be made to show compliance. (For limiting loads refer Section 3.2 of this TNS).

1.6 Twin-Astir Wheel Brake System.

Two cases have been reported of failure of the brake-plate torque stud, rotation of the assembly, and 'strangling' of the interconnection to the air brakes, making that system inoperative! Independent wheel brake systems are preferable. (Ulster G.C.).

PART 2 GENERAL MATTERS

2.1 Glider Types approved by B.G.A.

Please add: Club Astir, SIE 3, SF 26, Torva, Mosquito B, Mini-Nimbus (Modified with elevator tab). ASW 19.

2.2 ASW 19. Increased A.U.W.

Schleicher Tech Note 6a and 6b (and amended Flight Manual), introduces modifications to increase weight to 454 kg (1000lbs) - C of A renewal applications must indicate compliance with these T. Notes if increased weight is requested.

2.3 D.I.Y. BRUNSWICK PIPES

Sketch enclosed herewith, is for the benefit of those who prefer to make their own. (Courtesy of T.McFadyen, Cotswold G.C.)

3.5 Engine T.B.O's.

C.A.A. Notice No 35 (Issue 9) May 1978, at last grants 'ON CONDITION' T.B.O. to 'private' category aeroplanes. (These negotiations began in May, 1971, by the undersigned!!).

3.6 Chipmunk Mandatory Mods and Inspections.

The attached note may be helpful. Intense negotiations are in hand to down grade the non-mandatory TNS 165 (U/C-X-RAY). We have calculated that there have been no recorded 'incidents' in the U.K. since introduction into service in 1951, not withstanding an accumulation of hours exceeding 3,6200,000, and landings exceeding 9,050,000!

3.7 Gypsy Major Spark Plugs.

We are indebted to the MOTH Club and Gary Bisshop, for the attached list. (Stockists Marvin Tomkins, 127 Shirland Road, London W.9. 2ES. - 01-286-3022).

3.8 B.G.A. - Tug Maintenance Approval.

Negotiations have been initiated at the request of C.A.A. and formal application will be made shortly. AIRWORTHINESS INFORMATION LEAFLET AD/IL/0062-1-3, (attached), gives guidelines on the standards of accommodation, documentation and equipment which will be required for 'APPROVAL'. So far only 4 licenced aircraft maintenance engineers have been nominated to B.G.A. Many more will be needed.

3.9 Fuels and Oils. Nostalgic echo's from the simplified past, are transmitted in the attached extract from D.H. Engine Manual Ref G.M.M.I. !

3.10 Engine Power - Loss.

Disintegrating baffles in exhaust mufflers have caused significant power-loss on PA-18's and other similar types of exhaust.

PART 4 SHOP WINDOW

4.1 'PERSONAL AIRCRAFT INSPECTION HANDBOOK' , published by F.A.A. is a guide to D.I.Y. Light Aeroplane Maintenance, and is available from B.G.A. Shop, at discount price of £1.70 inc. postage.

4.2 C.A.A. Log Books. (Airframe and Engine - new style), are available from C.A.A. Area Offices.

4.3 Rallye Spares and Product Support.

Complaints have been received from a club about poor product support for the Rallye. The U.K. Agents are Air Touring Services, Biggin Hill, Kent. B.G.A. have written to A.T.S. requesting a recommended spares pack-up for the more remote operators. Clubs operating Rallye's are believed to be Lasham, Shobdon, Usk, Cranfield, Long Marston, Aboyne. Cooperation between these clubs might be worthwhile? (Alan Middleton, Aboyne).

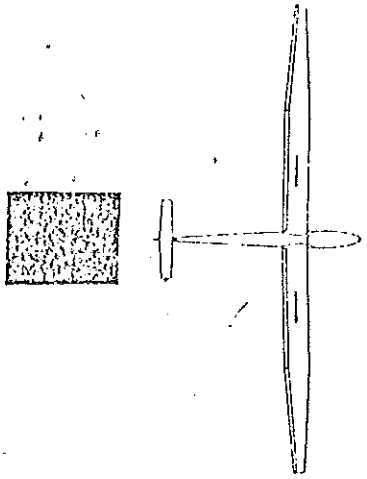
R. B. STRATTON.
CHIEF TECHNICAL OFFICER.

JULY, 1978.

TNS/6/7/78

DIAMANT

May 1978 No. 06



SERVICE BULLETIN

Mandatory

INSPECTION OF BONDING LINES IN WING AND RESTRICTION OF FLIGHT ENVELOPE

1. Planning information

1.1 Applies to the following gliders:

- Type: DIAMANT 16.5
  DIAMANT 18
- Serial Nos.: 11 - 80

1.2 Reason: Unsatisfactory bonding between spar cap and shear web found in one glider.

1.3 Purpose of the present bulletin:
- Instruction for the visual inspection of the hat section bonding.
- Restriction of flight envelope

1.4 Compliance: Mandatory before next flight

1.5 Approval: Approved by Swiss Federal Air Office

1.6 Man power: Inspection 1 hour

1.7 Material: None

1.8 Tools: Strip lamp
Angled mirror

1.9 Weight and Balance: no effect

1.10 Reference to other publications: none

1.11 Execution: The visual inspection may be made by the owner of the glider according to the instructions below.

./.

FFA
Flug- und Fahrzeugwerke AG
Altenrhein
CH-9422 Staad SG
Telefon (071) xxxxxxx
43 01 01

2.5 The main stub spar of the right wing (crossing the fuselage) shall be inspected visually as follows:

2.5.1 Black rings around the bolts fixing the finger fitting and the main bolt fitting to the webs of the stub spar may indicate a loose fitting.

2.5.2 Any sign of loosening of the webs are critical. Report to the manufacturer any supicious findings.

3. Restrictions of flight envelope

Gliders with no findings as per para 2.3 and/or 2.5 may be operated with the following restricted limitations until a more detailed inspection and repair shema has been worked out.

	km/h	mph	kts
Maximum speed V_{NE}	166	103	90
Caution speed range (no abrupt maneuvers, avoid turbulence with gust velocity above 7,5 m/s = 25 ft/sec)	120 ÷ 166	74 ÷ 103	64 ÷ 90
Maximum Speed with camber flaps fully positive	120	74	64
Maximum load factor			
in maneuvers	+2,8 ;	-1,4	
in gusts	+3,5 ;	-1.75	

Corresponding marks shall be attached to the airspeed indicator and the accelerometer.

4. Enter execution of Service Bulletin into log book.

Copy to B.C.A. 12/6/78.
TNS 6/7/78

Translation

BUREAU VERITAS

AIRWORTHINESS DIRECTIVE

GLIDER WA 30 BIJAVE

All Serial Nos

MAIN PORT AND STARBOARD WING TO FUSELAGE ATTACHMENT FITTINGS

Several cracks were found on the spot welds located around the bush of the main wing fittings. Therefore carry out the following as soon as possible after this Airworthiness Directive comes into force and in any case before 1 August 1978 :

1. Checking of the fittings to determine if the weld bead is continuous or discontinuous.

2. If the weld bead is discontinuous, carefully check the condition and look for cracks with a magnifying glass and a dye penetrant test.

3. If a crack is found, replace the fitting.

4. Include the inspection of the fittings to the annual maintenance programme.

5. Mention the work carried out and the resulting condition in the glider log book.

See : ISSOIRE AVIATION SERVICE BULLETIN NO 02

DATE OF ENFORCEMENT : 10 MAY 1978

Civil Aviation Authority
Airworthiness Division

AIRCRAFT RADIO & ASSOCIATED EQUIPMENT

ISSUE 3 Date APR '78

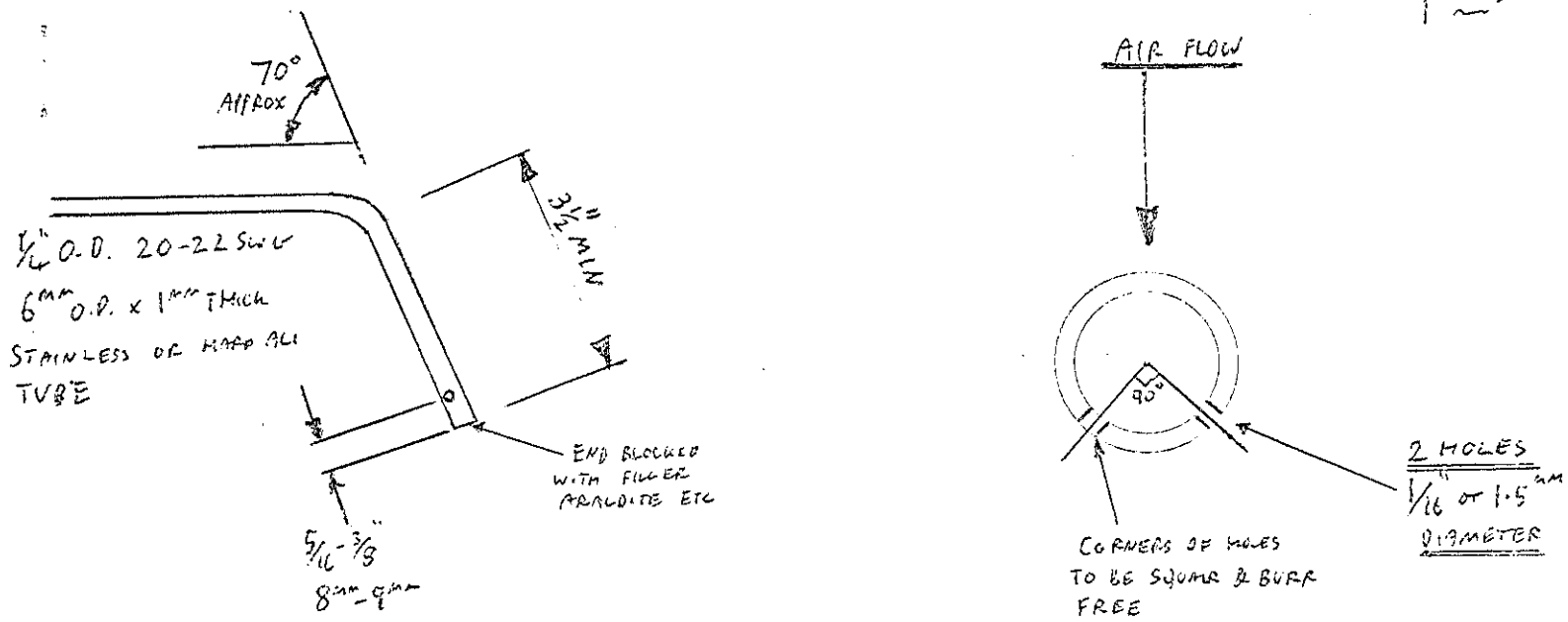
G No.	MANUFACTURER	EQUIPMENT
28-b	HT Communications	VHF Comm Tx-Rx, TR-7302
29-b	Dittel, W, KG	VHF Comm Transceiver FSG-40S
30-a	A K Mitchell	VHF Comm Tx-Rx AM7B/KM
31-b	QM70 Electronics Ltd	VHR Receiver HGR-1
32-b	Sharp Electronics (UK) Ltd	VHF Airband Receiver FX-209AU
33-b	HT Communications	VHF Comm Tx-Rx TR-7302
34-b	Nolton Communications Ltd	VHF Comm Equipment SABRE Air Band PMS/6A

Civil Aviation Authority
Airworthiness Division

AIRCRAFT RADIO & ASSOCIATED EQUIPMENT

G No.	MANUFACTURER	EQUIPMENT
1-b	Becker, Max Egon.	VHF Comm. Transceiver, AR12S
2-b	Skycrafters Inc.	VHF Comm. Transceiver, TRV122
3-b	REE Telecommunications Ltd.	"TELECOMM" VHF AM Portable Radiotelephone, TRT/2
4-b	Imp.Coll of Science & Technology	VHF Comm,Transmitter-Receiver, G.T.R. Mark II
5-a	MacPherson, G.C.J.	VHF Comm. Tx-Rx., TJD-101
6-a	Barton K.	VHF Comm Tx-Rx, KB-1
7-a	Barrett R.Q.	VHF Comm. Tx-Rx, RQ/AM/1
8-b	Handley Page Gliding Club	VHF Comm. Tx-Rx, HP.18
9-a	James P.W.	VHF Comm. Tx-Rx, PJ-2
10-b	Storey G.E. & Co.	VHF Comm. Tx-Rx, TR-6701
11-b	Murphy Aircraft Communications Ltd.	"Rambler" Portable VHF Comm. Tx-Rx. MR965A
12-a	Pratelli P.	VHF Comm. Tx-Rx, CH/168
13-a	Sykes A.W.	VHF Comm. Radio Telephone AWS.1.
14-c	Pye Telecommunications Ltd.	VHF Personal Radio Telephone "Pocketfone 70" type PF2 AMB
15-c	" " "	"Bantam" VHF Comm. T-RX
16-c	GEC (Electronics) Ltd.	"Courier" VHF Comm Transceiver
17-b	Ultra Electronics Ltd.	VHF Comm. Transmitter-Receiver "Packset" Type 3A4-AG3
18-b	Dittel W, KG	VHF Communication Transceiver Type FSG-15P
19-c	Avionic Systems (Heathrow) Ltd.	VHF Communications Transceiver, Type ASH-360 & ASH-360P
20-c	McMullin, T.A.	VHF Communications Transceiver Type TM.360.
21-c	Becker Flugfunkwerk	VHF Communications Transceiver Type AR 10 S
22-a	James, P.W.	HF Communications Transceiver Type PJ.7.
23-b	Becker Flugfunkwerk	VHF Communications Trisponder Type AR.7.
24-b	Electechniques	VHF Communication Transceiver ERT-2000
25-b	Edo-Aire	VHF Communication Transceiver RT551G
26-b	Dinosaur Electronics Ltd	VHF Comm Tx-Rx, ED-24
27-b	McMullin, T A	VHF Comm Tx-Rx, TM-6

ISSUE Date



POOR-MAN'S BRUNSWICK PIPE.

By courtesy of T. McFADYEN. etc etc.

TNS. 6/7/78.

BGA Form 267R.

Radio Installation Application--Motor-Gliders.

INSTALLATION AND FLIGHT TEST REPORT Date .....

Installer ..... Modification No .....

CAA Classification Minor

Owner's Name ..... Tel No .....

Address .....

.....

.....

Aircraft Type	Registration	Construotor's number
.....	.....	.....

Brief description of installation

.....

.....

.....

Electrical supply details

Generator .....V .....AH

Battery .....V .....AH

Aerial details

Type .....

Location .....

Mandatory notices fitted .(Class.....).....

Installation inspected and tested by .....BGA.No:...

on .....

Flight test

Ground station ..... Frequency ..... Range .....

Pilot ..... RT Licence ..... Date .....

Aircraft available for CAA/BGA survey at .....

on .....

Report to be forwarded to CAA Area Office, for the attention of the Radio Surveyor, or, for aircraft administered by the Popular Flying Association, to the local representative; or to the B.G.A Office.

INSTALLATION OF TM360 RADIO IN AIRCRAFT or similar simple types of radio.

1 Installation must be carried out under the supervision of a competent engineer; this will imply the services of a licensed engineer, PFA /BCA. inspector or person with adequate knowledge of approved aircraft installation practices.

2 Approval of an aircraft radio station requires approval of both the circuit arrangement or "design" of the installation and also the actual installation. The first requirement can be satisfied by a simple diagram of the electrical connections, preferably accompanied by a sketch or description of the mechanical arrangements.

Simple installation schemes will be classified by the CAA as Minor Modifications. This applies, for example, to a single radio being installed. More complex installations, involving two or more radios, will probably be classed as a Major Modification.

Approval of an installation design scheme classed as a Major Modification will be recorded on an Airworthiness Approval Note which will be sent to the applicant by the CAA. In the case of a Minor Modification, approval will be recorded on CAA form AD261 by the CAA surveyor.

3 Application for approval of a Major Modification has to be made on CAA form 282 requiring a fee of £10 to be sent with the form to the CAA, Brabazon House, Redhill, Surrey. On receipt of the form, they will send the relevant documents to the local CAA radio surveyor. This procedure does not apply to installations in aircraft administered through the PFA.

4 Installations must be inspected by the CAA surveyor or PFA inspector, as applicable. Satisfactory installations, following completion of a satisfactory air test, will be given a certificate of approval to comply with the requirements of the Air Navigation Order.

5 Aerials should be sited in approved positions for the aircraft type. If mounted in any other position, performance may be affected and the installation will be limited to Class 2 use. Information on approved siting may be obtained from the CAA, licensed radio engineers, radio workshops, etc.

6 If the radio equipment is not fed from the main aircraft electrical supply the installation will be limited to Class 3 use unless means are provided for measuring battery voltage in flight, or a standby battery and change-over switching system provided and adequate ground maintenance checks performed.

7 A radio flight test must be carried out in conjunction with a ground station approved for this purpose. The test must demonstrate adequate communication over a range of twenty miles at a height not exceeding two thousand feet above the ground station altitude.

8 An entry must be made in the aircraft log book giving brief details of the installation including weight and equipment serial number.

9 A radio licence for the aircraft radio station must be obtained from the GPO. Application is to be made on GPO form M2005.

10 For installations other than Class 1, an appropriate Class 2 or Class 3 placard must be displayed in the cockpit and the equipment labelled Class 2 or Class 3 also.

11 Fuses must be labelled and the fuse rating shown.

TNS/6/7/78

BENDIX

Airworthiness Directive

Volume I & II

78-09-07 BENDIX: Amendment 39-3205. Applies to Bendix S-20 Series, S-1200 Series and D-2000/D-2200 Series magnetos.

Compliance required as indicated unless previously accomplished.

To preclude magneto or engine failure resulting from magneto impulse coupling failure, accomplish the following:

a. On magnetos having less than 975 hours in service since new or overhaul on the effective date of this AD, accomplish the provisions of paragraph "C", of this AD prior to 1000 hours in service and each 1000 hours in service thereafter.

b. On magnetos having 975 or more hours in service since new or overhaul on the effective date of this AD, accomplish the provisions of paragraph "C", of this AD within the next 25 hours in service and each 1000 hours in service thereafter.

c. Inspect and replace, if necessary, impulse coupling components in accordance with paragraph "Detailed Instructions" contained in Bendix Electrical Components Division, Service Bulletin Number 599 or an equivalent inspection or procedure.

d. After accomplishing the instructions of this AD, make a log book entry showing the compliance time. Include the magneto make, model and serial number. Except for new or zero time overhauled magnetos, any magneto not accompanied by a record of operating time must be in compliance with paragraph "C" upon installation on an approved engine.

e. Equivalent inspections and procedures must be approved by the Chief of the Engineering & Manufacturing Branch, FAA Eastern Region.

f. As permitted by FARs 21.197 and 21.199, aircraft may be flown to a base where maintenance required by this Airworthiness Directive can be accomplished.

This amendment is effective May 9, 1978.

TNS/6/1/0

CHIPMUNK "MANDATORY" MODIFICATIONS & INSPECTIONS

Considerable "aggro", misunderstanding and costs can be generated between owners, maintainers and the CAA, over the above subject, not least in respect of HSA Technical Newsheet TNS 165, concerned with undercarriage castings.

At the General Aviation Consultative Committee Meeting (GACC) held with the CAA at Redhill on the 23rd May, 1978 (and at 6 monthly intervals), the Director General (Airworthiness) and the Chief Surveyor, both confirmed that the only list of "mandatory" modifications and inspections is CAA's publication "Mandatory Aircraft Modification & Inspection Summary" (MAMIS - The Red Book), in respect of UK manufactured aircraft and equipment. There are therefore, no debatable or "grey areas"!

The current list of mandatory TNS in respect of the Chipmunk, engine and propeller are:-

TNS 131 (or Mod H236) - Engine throttle & mixture control rods
TNS 138 - Spar boom safe-lives
TNS 154 - Fuselage assembly
TNS 161 - Wing fuselage attachment links.

In respect of Gypsy 10/2 engines:-

TNS GM 10 No. 47. Pressure testing induction mainfold heater box.

In respect of F.R. propellers:-

F.R.P. 001.1. Instructions for the strip examination at 300 hr intervals using magnified eyeball or dye penetrant methods ONLY.

There is NO CAA authority to make any other TNS "mandatory", and in particular TNS 165 is specifically not in this list, because the airworthiness implications are negligible. (TNS 165 is 'recommended' by HSA and even the RAF endorsed Form 700 Log Books to permit flying even though cracked!).

R.B. Stratton
CTO/B.GA.

TNS 6/7/78

GIPSY MAJOR SPARKING PLUGS

Plug Type	Size	Insulation		Electrode Material	Electrode Type	Approved for			RRP (3)
		Firing end	Screen			GM 1	GM 10-1	10-2	
KLG V12/2 (1)	12mm	M	us	N	Massive	(2)	no	no	£ 3.00
RV12/3 (1)	12mm	M	M	N	Massive	(2)	no	no	£ 3.00
RC50/R (1)	12mm	C	M	N	Massive	yes	yes	yes	-
RC50/RH	12mm	H	M	N	Massive	yes	yes	yes	£ 6.10
RC5/4 (1)	14mm	C	M	P	Fine Wire T2	yes	yes	yes	-
RC5/4I	14mm	H	M	P	Fine Wire T2	yes	yes	yes	£ 6.10
KA 1	14mm	H	M	P	Fine Wire T1	yes	yes	yes	-
Smiths SBS 1	14mm	H	H	I	Fine Wire T1	yes	yes	yes	Long Life
Lodge A55/4 (1)	12mm	M	us	N		(2)	no	no	-
S50/1	12mm	S	us	N centre P earth	Massive	yes	yes	no	£ 9.66
RS50/R	12mm	S	M	P	Fine Wire T2	yes	yes	no	£13.67
RS50/1R	12mm	S	M	N	Massive	yes	yes	yes	£10.16
RS5/7R (1)	14mm	S	M	P		yes	yes	yes	-
LR 1 (1)	14mm	S	M	N		yes	yes	yes	-

Key:
M mica; us unscreened; C Corundite; H Hylumina; S Sintox; N Nickel; P Platinum; I Iridium; T Tangential; R Radial; 1 Single earth; 2 Double earth

Notes: Mod G 2197 introduces cylinder head with 14mm spark plugs
(1) Obsolete - manufacture discontinued.
(2) Not recommended for use with leaded fuels.
(3) Typical retail price - excluding VAT and P & P

5. Ignition Harness. For owners who wish to fit a screened plug and have an unscreened harness fitted, a screened end fitting is available and may be purchased from Hants and Sussex. They are known as 'Watertight Fitting' - part number 44452 - price £1.35 each.

That Maintenance Approval. TNS 6/7/78

Civil Aviation Authority

Airworthiness Division

AIRWORTHINESS INFORMATION LEAFLET

Ref. AD/IL/0062/1-3

Date January 1978

Author's Initials HDTO/RPB/HACT

This Leaflet will not necessarily be kept up to date by reissues.

SUBJECT TITLE APPROVAL OF ORGANISATIONS TO CARRY OUT SPECIFIED MAINTENANCE CHECKS AND TO MAKE RECOMMENDATIONS FOR THE RENEWAL OF CERTIFICATES OF AIRWORTHINESS OF AIRCRAFT NOT EXCEEDING 2730 KG MTWA.

PURPOSE To amplify the requirements of BCAR A8-15. Group M3.

REFERENCES BCAR A8-15
AIRWORTHINESS NOTICE NO. 63.
AIRWORTHINESS INFORMATION LEAFLET ON LIGHT AIRCRAFT MAINTENANCE SCHEDULE REF. LAMS/FW/1978 AND LAMS/H/1978.

1 INTRODUCTION

1.1 With the introduction of new procedures for certification and maintenance of aircraft not exceeding 2730 kg MTWA a requirement exists for those aircraft in the public transport or aerial work category to have the annual inspection carried out by an organisation approved by the CAA for the purpose. In addition every third year all aircraft excluding those in the Special Category will be required to undergo a Star Inspection at such an approved organisation for the purpose of a recommendation being made to the CAA for the renewal of the C of A.

Note: The term Star Inspection is given to the overall assessment of an aircraft, its engines, propellers, equipment and records every third year by appropriately licensed engineers working within an appropriately approved organisation for the purpose of making a recommendation to the CAA for renewal of the Certificate of Airworthiness, the depth of physical inspection being determined by (the effectiveness of) previous maintenance records and use to which the aircraft has been put since last C of A renewal or issue. It is

4 STAFF AND TERMS OF APPROVAL

4.1 The terms of approval of each organisation will be based on those aircraft types for which licence coverage is available within the organisation; where it cannot be shown that a full complement of the requisite categories of licensed engineers with the appropriate ratings are full-time employed by the organisation acceptance of other licensed personnel, e.g. radio engineers etc. may be considered subject to there being evidence of an agreement between the two respective parties.

5 ACCOMMODATION

5.1 Hangarage or other roofed static accommodation of a size suitable for the types of aircraft for which approval is sought is an essential feature of organisations seeking approval.

6 EQUIPMENT

6.1 A facility holding all the necessary equipment for the maintenance of the full range of aircraft for which approval is sought would be an ideal situation, but a measure of compromise may be necessary between those items held by the organisation and frequently used and other equipment used infrequently but nevertheless readily available from another source when required.

7 TECHNICAL LITERATURE

7.1 Another matter essential for approval is that all supporting documentation for maintaining continuing airworthiness of those aircraft, engines, propellers and equipment for which approval is sought, is available within the organisation concerned, or that evidence exists to show that an acceptable alternative arrangement has been made to provide such data when required. It is important to ensure that the organisation has suitable staff to assess this information and take the requisite action and record the results as appropriate.

NOSTALGIC ECHO'S FROM THE SIMPLIFIED PAST!

CARE AND MAINTENANCE

OF THE

130 H.P.

D.H. GIPSY MAJOR

AERO ENGINE

When referring to this publication please quote G.M. Gen. M. I.

This issue incorporates Amendments Nos. one—eleven.

The Gipsy Major Handbook can be kept up to date by the addition of amendment sheets which are issued in connection with any essential modification which takes place on the engine. These sheets can be had on application to the engine manufacturers.

If the numbers of the amendment sheets already in the handbook are quoted, the remainder will be sent to complete these up to the latest issue. The numbers referred to are printed on the top right-hand corner of the amendment sheet.

Issued by the Manufacturers:

THE DE HAVILLAND AIRCRAFT COMPANY, LTD.
STAG LANE, EDGWARE, MIDDLESEX, ENGLAND

Fuel: Good grade automobile fuel.

Fuel Pumps: A.C. Sphinx (specially adapted for Gipsy Engines).

Oils: Ordinary Flying ... Wakefield's "Castrol XXL."
Shell "Aero" and "Golden."
Vacuum "Mobiloil Aero W."

Racing ... ... Wakefield's "Castrol XXL."
Shell "Aero."
Germ Lubricants, Ltd., "Germ Motoil XH."
Vacuum "Mobiloil H."

Cold Climates ... Wakefield's "Castrol CW."
Shell "Double."
Vacuum "Mobiloil A."

The following oils are also approved:—

Ordinary Flying ... Pratt's "Standard 120."
Wells' "Germ Motoil XH."
Wakefield's "Castrol C."
Texaco "Texaco 100."
Anglo-Persian "B.P. Medium Aero."

Oil conforming to Air Ministry Specification D.T.D. 109 is approved and is supplied to this specification by the following Companies:—

W. B. Dick & Co., Ltd. (ILO Aero).
Ragosine Oil Co. (Minix 90).
Silvertown Lubricants, Ltd. (Speedolene).

COMPRESSION RATIO = 5·25 : 1.