BGA AIRWORTHINESS AND MAINTENANCE PROCEDURES

PART 4, LEAFLET 4-4

MAINTENANCE AND REPAIR OF WOODEN STRUCTURES

INTRODUCTION

1. Wooden aircraft structures are particularly vulnerable to deterioration due to glue failure. Casein glues, used extensively in the manufacture of older gliders, are particularly susceptible to damp when stored in a poorly ventilated environment such as a 'sweatbox' trailer. However, modern synthetic glue systems are much more reliable. Nevertheless the wood itself is a natural substance, liable to deterioration due to shrinkage and attack by fungus or moisture. Its continued integrity relies on the maintenance of the correct environment: not too dry, causing shrinkage and splits; not too moist, causing rot.

INSPECTION TECHNIQUES

2. Points to note during examination of wooden structures include:

a. Paintwork is not just cosmetic and has an airworthiness function in keeping out moisture. Cracked and flaking paintwork must therefore be repaired.

b. Local areas of cracked or flaking paintwork should be investigated: this may be caused by deteriorated fabric covering underneath, or may even be caused by cracked or delaminated wood underneath unbroken fabric.

c. Moisture prone areas require particularly close examination: such areas include the underside of wing leading edge boxes and airbrake housings.

d. A musty smell from access holes or panels probably indicates fungoid growth, decay or damp.

e. Wood has less strength in compression than in tension. Compression damage is difficult to spot: compression `shakes' are faint lines across the grain caused by local collapse of the fibres.

f. Wooden structures undergo seasonal changes due to moisture absorption, causing dimensional changes enough to change cable tensions and control surface rigging, causing measurable changes in glider empty weight.

g. Steel bolts through wooden members often deteriorate faster than the wood itself. Sample checks of bolted fittings should be made on an opportunity basis: to do this access holes in fabric or plywood may be needed for access to retaining nuts which are rarely of the captive variety.

h. Bolted fasteners must never be overtightened: it is very easy to crush the fibres of the wood. Whenever bolts are fitted through wooden structure an approved jointing compound must be used.

i. Further detailed information on examination of wooden structures is contained in Civil Aircraft Airworthiness and Inspection Procedures, Part 6, Leaflet 6-1.

REPAIR OF WOODEN STRUCTURES

3. Minor repairs to wooden structures should be made using the techniques and repair schemes described in the BGA publication `Standard Repairs to Gliders'. Major repairs, which includes all repairs which affect the structural integrity of the glider, are to be supervised and certified by a BGA Senior Inspector.