



Ministry
of Defence

Ministry of Defence
Main Building
Whitehall
London SW1A 2HB
United Kingdom

Ref: FOI2018/02051

E-mail: [REDACTED]@mod.gov.uk

Mr [REDACTED]
[REDACTED]
[REDACTED]@whatdotheyknow.com

24 August 2018

Dear Mr [REDACTED]

Thank you for your email of 8 February requesting the following information:

"I request a listing of companies that have acted as Design Authorities for Viking and Vigilant aircraft since their entry into service. For your information, this date appears to have been around 1984.

I further request copies of DAOS expositions (formal submissions), DAOS related audit reports, and formal DAOS certification documents for the companies so authorised.

Please note that this request is not limited to authorisations granted by the MAA under their DAOS scheme instituted post 2010. A comprehensive Design Authority approval scheme was already in place within the MoD when these aircraft were originally purchased.

To assist, I can confirm that Slingsby Aviation Limited were, in 2002, the 'designated Design Authority' for the Viking aircraft. It is likely that this company was the original DA.

To further assist, I have accessed the MAA's Approved Companies listing on the website, and I understand that the current DAOS authorisation (UK.MAA.DAOS.0153 for Marshalls of Cambridge Aerospace Ltd) allows for 'Development of Viking Glider aircraft'. I would be grateful for confirmation that this approval also covers design of modifications and approvals of repair schemes. If this is self evident in the DAOS certification document that I have requested, no separate confirmation is required."

I am treating your correspondence as a request for information under the Freedom of Information Act 2000 (FOIA).

A search for the information has now been completed within the Ministry of Defence, and I can confirm that some information in scope of your request is held.

Please accept our apologies for the delay in answering this request. The scope of the request was such that it required us to identify, locate & search archived files dating back to 1984 which I'm sure you will appreciate took considerable time. However, I can confirm that the search revealed no information is held before the current MAA DAOS Scheme came into existence and therefore the focus of this request is solely on documents relating to Marshall's of Cambridge Aerospace Ltd as the Design Authority.

The request has been broken down into 4 parts as listed below:

Part 1 – Listing of Companies

The information you have requested can be found below.

Viking:

Slingsby Aviation Limited (not included in MAA DAOS Approval Scheme)
Marshall's of Cambridge Aerospace Ltd

Vigilant:

There is no DAOS approval in place for the Vigilant glider however an MAA approved Alternative Acceptable Means of Compliance (AAMC) has been issued 20 Sep 16 accepting Grob Aerospace AG as the design organisation based on their holding a civil approval from EASA.

Part 2 – Design Organization Expositions

The information you have requested in Part 2 falls entirely within the scope of Section 41 (Breach of Confidence) of the FOI act and has been withheld.

Section 41 has been applied because the information has been provided in confidence and to disclose it would be a breach. Section 41 is an absolute exemption and there is therefore no requirement to consider the public interest in making a decision to withhold the information.

Part 3 – Certificates

The information requested in Part 3 of the request can be found attached but some of the information falls entirely within the scope of the absolute exemption provided for at section 40 (Personal Data) of the FOIA and has been redacted.

Section 40(2) has been applied to some of the information in order to protect personal information as governed by the Data Protection Act 1998. Section 40 is an absolute exemption and there is therefore no requirement to consider the public interest in making a decision to withhold the information.

Part 4 – Audit Reports

The information requested in Part 4 of the request can be found attached but some of the information falls entirely within the scope of the absolute exemption provided for at sections 40 (Personal Data) and qualified exemption provided for at sections 43 (2) (commercial interests) of the FOIA and has been redacted.

As stated above, Section 40(2) has been applied to some of the information in order to protect personal information as governed by the Data Protection Act 1998. Section 40 is an absolute exemption and there is therefore no requirement to consider the public interest in making a decision to withhold the information.

Section 43 is a qualified exemption and subject to public interest testing which means that the information requested can only be withheld if the public interest in doing so outweighs the public interest in disclosure. Section 43(2) has been applied because the information requested contains details which are commercially sensitive and could prejudice the commercial interests of the organisations involved. The balance of public interest was found to be in favour of withholding the

information given that release could cause reputational harm and for these reasons I have set the level of prejudice against release of the exempted information at the lower level of "would be likely to" rather than "would".

Under Section 16 of the Act (Advice and Assistance) you may find it helpful to note the audit cycle operate with a report being written up at the time and then a series of engagements that are not included in the report being used to close issues. Such audits are designed to uncover inconsistencies and individual oversights to ensure that the design organisation and design outputs are maintained at the required standard. Therefore, when read in isolation, the Audit reports may not provide the full picture of an organisations expertise and overall performance.

If you are not satisfied with this response or you wish to complain about any aspect of the handling of your request, then you should contact us in the first instance at the address above. If informal resolution is not possible and you are still dissatisfied then you may apply for an independent internal review by contacting the Information Rights Compliance team, Ground Floor, MOD Main Building, Whitehall, SW1A 2HB (e-mail CIO-FOI-IR@mod.uk). Please note that any request for an internal review must be made within 40 working days of the date on which the attempt to reach informal resolution has come to an end.

If you remain dissatisfied following an internal review, you may take your complaint to the Information Commissioner under the provisions of Section 50 of the Freedom of Information Act. Please note that the Information Commissioner will not normally investigate your case until the MOD internal review process has been completed. Further details of the role and powers of the Information Commissioner can be found on the Commissioner's website, <http://www.ico.org.uk>.

Yours sincerely,

DSA Secretariat



Audit Type: DAOS

Approval Ref: UK.MAA.DAOS.153

MAA AUDIT REPORT					
Organization	Marshall of Cambridge Aerospace Defence Group				
Site(s)	The Airport, Cambridge, CB5 8RX				
Audit dates	28/29 November 2013				
Audit title and Reference	Surveillance: 201311128 – Marshall (153) Audit Report - P				
Audit scope, Criteria & Objectives	Annual Surveillance in accordance with agreed DAOS schedule. Objective to assess organisation's continued compliance with DAOS, confirm extent of organisation changes, review design activity undertaken and progress in closure of the remaining CARs from previous surveillance activity.				
Audit team	[Redacted]	Role	Team Leader	Post	Approvals Manager
	[Redacted]	Role	Support Specialist	Post	Structures and Materials
MAA Observers	[Redacted]			Post	DAOS Branch Head
Principal Auditee(s)	[Redacted]	Role	Senior Certification Engineer		
	[Redacted]	Role	Certification Consultant		
	[Redacted]	Role	Director of Engineering/Chief Designer		
	[Redacted]	Role	Chief Airworthiness Engineer		
	[Redacted]	Role	Quality Engineer		
	[Redacted]	Role	Group Leader - Design		
	[Redacted]	Role	Safety Manager		
	[Redacted]	Role	Principal Engineer		
	[Redacted]	Role	Head of Repairs		
Executive Summary	Marshall Aerospace Defence Group (MADG) continues to be active in support of the RAF C-130 fleets, particularly in repairs. The organisation is currently restructuring under Fitness for Growth programme which will have an effect on staff numbers, but this was stated not to affect core capabilities. Access to design records seen to have significantly improved and projects sampled were generally well documented with thorough substantiations.				

	<p>Level ■ CARs were raised regarding positive evidence of review of aircraft Design Organisation (DO) feedback and clear identification of exceptions/limitations on Certificates of Design provided to PTs, together with ■ further observations.</p>
Recommendation	<p>On the basis of the above, continuation is recommended. The former ■ activity can be considered as integrated within MADG with Kirkbymoorside as an additional site undertaking detail design to MADG procedures. At present the former Hawker Beechcraft activity remains largely separate operating its previous procedure suite with independent audits. Evidence was seen of involvement of ■ personnel beginning to become involved within the MADG Group and Cambridge-based personnel are supporting the former Hawker site where the personnel have remained with the previous entity.</p>

Number of findings	Non-conformity		Non-compliance	
	Level 1	■	Level 1	■
	Level 2	■	Level 2	■
	Observation	■	Observation	■

Description of approach and methodology	<p>Introductions</p> <p>The audit was carried out in accordance with the published Agenda and commenced with an opening meeting with the overall Management Team. ■ advised that he would be present for the first day due to the need to support face-to-face briefings for the organisational changes. ■ (Certification Manager) had previously advised his apologies as he was on scheduled leave but that ■ (Senior Certification Engineer) would be nominated to represent him throughout the visit.</p> <p>The audit was witnessed by ■ – MAA DAOS Manager both as part of routine standardisation of MAA/CAAi audits but also to review CAAi follow-up of elements from the recent MAA audit of the Kirkbymoorside (former Slingsby) site, specifically composites competency.</p> <p>Scope of Approval</p> <p>As a result of the previous MAA audit an amended Scope of Approval was issued by the MAA on the 21st November 2013, largely to reflect the support for the Viking glider and also to include acceptance of recent staff changes as confirmed below.</p> <p>Changes to Organisation</p> <p>Since the previous visit, ■ had moved from Engineering Director to a more projects related role as Director of Engineering Solutions, with his role as Engineering Director being taken up by ■, the Chief Designer.</p> <p>In addition, ■ had retired from his position as Chief Airworthiness Engineer (but is still available on a consultancy basis) with ■ joining the Group as Chief Airworthiness Engineer.</p> <p>All of the above changes had been previously advised and were known to the audit team both in CAA/EASA and MAA capacities and were not reviewed further during the audit.</p>
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In the run-up to the visit, press reports had been noted indicating potential redundancies within the Group and the Organisation was requested to confirm its intentions within this area. [REDACTED] advised that this was the case, and that briefings to all staff were in fact taking place during the period of the visit.

Although the future business position remained firm, the organisation had found itself with capacity exceeding demand as a result of the run-down of various contracts and around [REDACTED] had been identified across the group.

[REDACTED] advised that while the Engineering function would have to take its share ([REDACTED]), core expertise in design and certification would remain in all scope areas and there was no intention to reduce capability. The audit team was provided with the internal position statement as issued to staff by [REDACTED] - MADG Group CEO.

MADG retains its previously advised EN9100 Rev C approval under AFNOR (Note to MAA, this is not a Certification Body subject to oversight under the UK Approved Register of Organisations but located in France and there under their National Scheme for oversight under the Industry Controlled Other Party (ICOP) arrangements.

It was noted that MADG will not be maintaining a separate TickIt accreditation, as AFNOR would be covering under the EN9100. This led to a further discussion regarding certification support for software, with the Marshall personnel present advising that software personnel were not retained. This is consistent with the current DAOS approval certificate.

Review of Open CARs

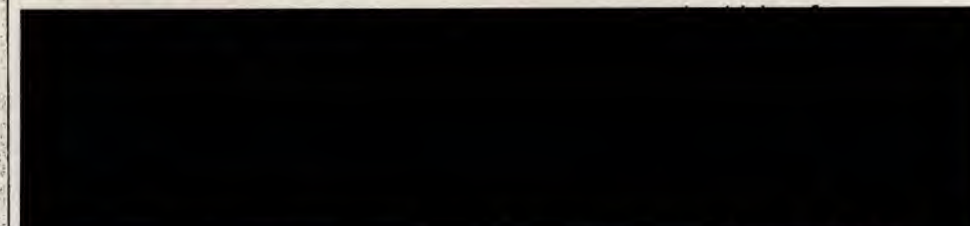
Status of CARs remaining from previous surveillance activity at Cambridge was reviewed as below:-

4Q11/01 – Content of Design Records

This related to the need to carry out a review to ensure that the newly established baseline of design records/indexing was present in all active projects. This was stated to have been carried out by the organisation shortly after the finding was raised – although it was not possible to locate the specific Quality Report during the audit confirming which projects had been actually reviewed and the actions taken, the standard of indexing and speed of access to the design records sampled during the remainder of the audit was considered sufficient evidence that action to address the finding had been effective.

Recommend Closure.

4Q11/02 – Design Reviews



Recommend Closure on provision of amended procedure to MAA.

4Q11/03 – Declarations on sampled CofD

Amended documentation showing revised approach to declarations reviewed and accepted. New approach to advising differences with 00-970 arising from base data also seen during product sample for current audit.

Recommend Closure.

Staffing and Competency

Authorisation list Issue 28 dated 29th October 2013 was noted and used as the basis for checking signatory authority throughout the visit, this is referenced in support of the DAOS Exposition.

It was noted that although the documents defined the intended signatories and sampled documents showed that these were the signatories used, [REDACTED]

Observation UK.MAA.DAOS.153.2013/OBS1 refers

As a result of the integration of the former [REDACTED] facility into the Marshall approval, particular attention was directed at the evaluation of this competency in support of the MAA audit of that site. As well as signatory authority for approval of documents, individual technical competencies and ability to sign for preparation/checking are contained in the Engineering Skills Matrix (Issue 04) as referenced from Procedure 4-I200-02.

Sample check was undertaken using [REDACTED] and [REDACTED]. Review of the staff records in support of the above nominations showed that the justification for the composites extension for [REDACTED] was blank.

[REDACTED]

Given the relative experience levels of the individuals involved this is not considered of sufficient risk to justify a CAR but is raised as an Observation for action:-

Observation UK.MAA.DAOS.153.2013/OBS2 refers

Safety Management System (RA1200)

With the introduction of RA1200 into the overall MRP, the opportunity was taken to review the overall Marshall Aerospace system in this area, at which point the audit was joined by [REDACTED] – Safety Manager. [REDACTED] has completed the Systems Safety Engineering course in York and has access to a team of [REDACTED] personnel to support the function with [REDACTED] in the HIOS/TRIOS team to support the PTs via the Cassandra tool.

The organisation was aware of the introduction of RA1200, as the current Safety Management arrangements are of long standing they specifically address Def Stan 00-56.

Procedure 04-P1001 (Issue 2 16th November 2011) addresses Safety Management Planning within the organisation, responsibility for which can be directly by the team or by allocation within a project and mentoring by a Safety Engineer. The Safety Management Plan (SMP) will be raised/ approved via a Senior Safety Engineer – reference to sample plan structure noted reference to integrating subcontractors and to the Certification and Test Plan. Safety Auditing structures in liaison with the PTs (example HTPT) noted within ability to support Independent Safety Audits.

System Safety Assessments are conducted using Procedure 04-P1002 Issue 5.01 dated 24th October 2013. Mention was made of discussion of Safety Engineering principles with HIOS, including establishment of a System Safety Working Group to discuss FHA and Hazards, either as a standing body or ad-hoc to support project needs.

Circumstances leading to the creation of a Safety Review board were discussed, - these are included in the Exposition (00-01-E002 at Issue 11), with Chapter 3 identifying SRB make-up, decision to hold via Chief Engineer, Chief Airworthiness Engineer and Safety Manager is described – is an SRB necessary ?, who needs to be there ? etc. The procedure including the potential for a independent consultant where required.

Overall the organisation is considered well-practiced in this area and no CARs were raised.

Design Activity

Marshall had previously advised recent design activity as part of the preparation for the audit as follows:-

C130J:

- MA [REDACTED] SATCOM Antenna onto Fwd Upper Escape Hatch
- MA [REDACTED] Repairs to [REDACTED]
- MA [REDACTED] Repairs to [REDACTED]
- MA [REDACTED] Repairs to [REDACTED]
- MA [REDACTED] Repairs to [REDACTED]
- MA [REDACTED] Repairs to [REDACTED]

Tristar:

- [REDACTED] Interiors – To introduce various loading configurations to regularise the ATOM AP101B-5100-11D
- 3321 Equipment/Furnishings – Relocation of Miscellaneous Emergency and Loose Equipment and associated placards
- MA [REDACTED] Bleed Air Valve Insulation
- MA [REDACTED] Fire Extinguisher Bottles
- MA [REDACTED] Blanking of Unused AAR Receiving Line

Arrestor Gear:

- DMAC/[REDACTED] Introduction of 1.125" Diameter Pendant Cable for RHAG Mk. 1

Given current focus of activity it was agreed to concentrate on the Hercules support, initially with the integration of the SATCOMM antenna and then reviewing ongoing repairs as recommended in the audit report issued in early 2012.

The arrestor gear is not airborne equipment and as it was confirmed that the issue of a C of D under DAOS was not requested this was not sampled during the visit.

Sample of Design Activity

MA [REDACTED] SATCOM Antenna

At this point the audit was joined by [REDACTED] – Principal Engineer/Group Leader Design to review the project documentation. The modification is in support of C130J in order to allow fitment of a replacement powered antenna on an escape hatch. The final Certificate of Design has not been issued at this point although an interim C of D 9 9 (ICD/HERC(1980)RE/13/0424) has been raised and was noted to have been signed by [REDACTED] and [REDACTED] in their accepted DAOS capacities as Engineering and Board signatories respectively. Additionally the Interim C of D had been endorsed by the PTL, the Interim C of D had been issued to allow ground testing which was explicitly stated in the limitations.

Substantiation contained in Engineering Report ER/HERC(1980RE)/12/0784 was reviewed, signatory capacities of [REDACTED], [REDACTED] and [REDACTED] were all checked and signing within authorisation.

Engineering record access was excellent, with the searchable interface in the Technical Office Reports Register (TORR).

The overall report register for the Modification was reviewed and additional Engineering Reports sampled to review detailed compliance:-

ER/HERC(1980RE)/12/0194 addressed birdstrike trajectory analysis, it was noted that this report undertook a risk assessment based on certain assumptions to support ALARP determination.

Structural substantiations were contained in calc-HERC(1980re)/12/0953.pdf, review of which identified a single instance (1.1.5.4) where the source of the baseline data/requirements for the flutter/vibration cases were not identified. This was considered an isolated occurrence but was brought to the attention of the organisation at the Closing Meeting. Additionally, the rationale of why the assumptions made in the baseline data were not given in the report. MADG stated that it had been custom and practice for many years to use this method of substantiation for antennas with no service difficulties.

As the project was currently at the status of Interim C of D and had not completed full engineering sign-off (MADG were awaiting a DDP from the GFA unit supplied to complete their engineering evaluation), specific CARs/ Observations were not raised but the following notes were provided at the Closing Meeting for the organisation to consider in completing the project:-

1. GFA items are expected to be provided with Certificate of Design (CofD) and not DDP. The C of D is expected to be provided by the PT, and the DAOS organisation needs to establish that it has maintained compliance with any listed Installation Limitations.
2. The current "Interim C of D" is does not comply with the MAA template. This is not considered a regulatory release the use of the MAA format for such interim certifications should be considered.
3. With regard to clarity to the PT of any exceptions/limitations to the C of D, [REDACTED]

[REDACTED] This is quoted as supporting evidence to CAR/2.

Day 2 - Sample of Design Activity (Continued)

C130 Repair Activity

At this point the audit was joined by [REDACTED] to support the discussions on the repairs aspects. Repair activity is carried out via individual tasking under sustainment contract HERCJC/00041 - contract reviewed and currently identifies 05-123 but understood to be shortly due for a refresh which will call up MRP RAs ([REDACTED] - contact point).

Overall, repairs are controlled accordance with the additional control processes introduced as a result of previous DAOS audits. General statement made that all repairs designed by MADG were/are referred to [REDACTED] for comment and a no technical objection statement.

Repairs designed for aircraft under depth maintenance would have a C of D issued, whereas off site repairs would be released by a drawing only. C of D in general will cover all the repair design activity required to complete an individual aircraft's depth maintenance, and thus will cover all repairs embodied which were beyond the C130J OEM Structural Repair Manual.

It was noted during the review of the supporting contract documentation that the contract itself references the 'C130J PMP and sub-tier documents' as defining the design standard - during the subsequent review of design documentation MADG were noted as using Def-Stan 00-970 as the basis of their certification statements. It was not apparent that MADG had obtained and reviewed the PME etc for any effect on the design assumptions within Def Stan 00-970 in establishing a certification baseline.

Observation UK.MAA.DAOS.153.2013/OBS2 refers

MA [REDACTED] (repair to [REDACTED])

Documents reviewed

CofD	CD/HERC(2043)/13/0638
Type Modification Record	TR/HERC(2043)/13/0639
Drawing	MU4-03-0044 GA of Repairs - A/C [REDACTED]
Stress Reports	CALC/C130J(2043)/13/0554
	CALC/C130J(REP)/13/0110

The stress report CALC/C130J(REP)/13/0110 listed all the individual repairs embodied during the maintenance input giving a brief description and reference to relevant design substantiation. The following specific repairs were sampled:

DR94245	Unable to Heat treat Skin P/N 362009-12
RP94336	Repair to cracked welds P/N 389347-7
DR 93910	Lower aft nacelle doubler cracked P/N 361122-7R
94029	Hole enlargement
94909	Z pan

The communication with [REDACTED] is recorded and archived via a computer package. All the repairs cited above were shown to have been reviewed by [REDACTED] with no technical objections raised by the OEM.

MA [REDACTED] (repair to [REDACTED])

Aircraft [REDACTED] whilst in theatre suffered significant damage during a hail storm, this repair covered the recovery of the centre fuselage skin damage.

Documents reviewed

Stress Report

CALC/C130J(2056)/13/0576

Damage Assessment

LM1-2289

Project Weatherman - C-130J ZH869 - Airworthiness Advice -
MA&DG/ENG/AW/003-13/MR

The damage found during assessments made after the hail storm had identified numerous individual faults. To keep the aircraft in service MADG made an assessment of the faults and developed an inspection plan to allow the aircraft to be released back to service without repair. Although all of the faults had been reported to [REDACTED], only 10 of the worst case faults had been fully reviewed by the OEM. MADG showed evidence of evaluation of all the faults in relation to the 10 worst cases that indicated that none of the faults detected impacted the structural integrity more than those cited as worst case.

The communication between MADG and [REDACTED] was recorded via the computer packages previously mentioned. From the sample review of records it was noted that DR95986 showed that [REDACTED] requested further specific NDI/inspection of underlying structure in support of the repair decision, [REDACTED]

Finding UK.MAA.DAOS.153.2013/CAR1 refers

It was also noted that the supporting Airworthiness Advice package for Project [REDACTED] identified exceptions and limitations which needed to be understood by the accepting PT, [REDACTED]

Finding UK.MAA.DAOS.153.2013/CAR2 refers

Internal Audit and Quality System

Review of the internal audit records was undertaken with the support of [REDACTED]. In response to previous findings in this area internal audits were noted to be carried out using a high-level checklist showing reference to the DAOS requirements and with specific projects reviewed both for individual design tasks and repairs. Allocation of specific resource has maintained improvement noted during previous surveillance.

Closing Meeting

A formal Closing Meeting was conducted with the audit participants, including a summary presentation of the intended CARs via Powerpoint, a copy of which has been provided at the same time as the preparation of this report. The maturity level that the organisation's electronic records system has now reached and ease of retrieval was particularly noted during the visit and commented positively upon during the closing meeting.

~~PROTECT - COMMERCIAL~~

Summary of each finding	UK.MAA.DAOS.153.2013/CAR1 Level <input type="checkbox"/> Non-Compliance - Interface with Aircraft Design Organisation UK.MAA.DAOS.153.2013/CAR2 Level <input type="checkbox"/> Non-Compliance - Exceptions and Limitations UK.MAA.DAOS.153.2013/OBS1 Observation Non-Conformance - Checking Responsibility for Certificate of Design UK.MAA.DAOS.153.2013/OBS2 Observation Non-Conformance - Training Records supporting composites authorisation UK.MAA.DAOS.153.2013/OBS3 Observation Non-Conformance - Documents defining C-130 design standards		
Other issues requiring attention	None.		
Completed by	[Redacted]	Date	31 st January 2014
Approved for release by	[Redacted]	Date	31/1/14

Content cross-checked by [Redacted]



Audit Type: DAOS

Approval Ref: UK.MAA.DAOS.153

MAA AUDIT REPORT					
Organization	Marshall of Cambridge Aerospace Defence Group				
Site(s)	The Airport, Cambridge, CB5 8RX				
Audit dates	27/28 October 2014				
Audit title and Reference	Surveillance: 20141028 – Marshall (153) Audit Report - P				
Audit scope, Criteria & Objectives	Annual Surveillance in accordance with agreed DAOS schedule. Objective to assess organisation's continued compliance with DAOS, confirm extent of organisation changes, review design activity undertaken and progress in closure of the remaining CARs from previous surveillance activity.				
Audit team	██████████	Role	Team Leader	Post	Approvals Manager
	██████████	Role	Support Specialist	Post	Electrical and Avionics
MAA Observers	None			Post	
Principal Auditee(s)	██████████	Role	Certification Manager		
	██████████	Role	Senior Certification Engineer		
	██████████	Role	Chief Airworthiness Engineer		
	██████████	Role	Quality Engineer		
	██████████	Role	Chief Engineer – Military Modifications		
	██████████	Role	Design Engineer Principal 1, Military Mods/Minor Mods Group		
	██████████	Role	Senior Flight Test Instrumentation Engineer		
Executive Summary	Representative sample of MADG DAOS activity (C-130 and Viking gliders) undertaken. Organisation numbers have largely stabilised following Fitness for Growth although there have been further changes in management personnel. Internal audit arrangements were seen to have improved and access to design documents was excellent, however from the sampled projects improvements were identified as necessary in substantiation/ compliance documentation for installed equipment and CARs at Level █ relating to these aspects were raised accordingly.				

Recommendation	On the basis of the above, continuation is recommended.
	As the comments related to equipment substantiation were made on two projects on separate platforms it is recommended that MADG undertake an overall review of internal procedures regarding equipment qualification (including GFE) to meet current RA requirements.
	Noted that the comments related to FLARM integration may be relevant on other platforms (understood to have been installed by BBMF) other than those for which MADG is responsible and this is advised to MAA for their consideration. It was further recommended that MADG initiate a meeting with customer (UK MFTS-TA Glider Support Authority) to confirm the extent of the current installation certification and whether any further work is necessary.

Number of findings	Non-conformity		Non-compliance	
	Level 1	0	Level 1	0
	Level 2	0	Level 2	■
	Observation	0	Observation	■

Description of approach and methodology	Introductions
	The audit was carried out in accordance with the published Agenda and commenced with an opening meeting with the overall Management Team. [REDACTED] (Director of Engineering) extended his apologies for the visit as he was scheduled to undertake face-to-face briefings as part of the MADG Senior Management engagement activity.
	Visit commenced with general discussion on developments in DAOS, including likely intent to transition to an EMAR 21 based approach with supporting RA changes during 2015.
	Scope of Approval
	Amended Scope of Approval issued by the MAA on the 14 th August 2014 to address repairs and introduction of [REDACTED] as Chief Test Pilot. The organisation advised that Exposition amendment is was in preparation to reflect further personnel changes (see below) and also to reflect ICAO Annex 19 changes on SMS for the civil sector. DAOS aspects were previously covered as a supplement but will now be included as a separate section of the main Document, reflecting use of the same main company processes but addressing specific requirements pertinent to the MAA approval as/when these are required. A compliance matrix template will be used to address requirements differences, especially with regard to compliance with Def Stan 00-56. The audit team noted care needed to be taken with regard to the appropriate revision of Def Stan 00-56 to ensure applicability to the Air Sector. A Draft issue 13 was tabled as evidence that the amendment process had commenced, this will need to be advised to the MAA in support of the DAOS approval in the normal manner.

MADG is now appointed as a coordinating design organisation for C-130J; letter of authorisation from MAA presented dated 18th August 2014; authorisation scope is as defined in Annex A to the GDA (General Design Arrangement with [REDACTED]) but MADG may operate beyond the scope of the GDA for operational necessity with specific MOD PT Leader ([REDACTED]) agreement.

Similar arrangement in place for the Viking glider (ex-Grob).

Changes to Organisation

As noted above MADG confirmed that further staff changes had since taken place since the last update to the Scope of Approval letter, specifically nomination of the former Deputy Chief Designer Structures, [REDACTED] as Chief Engineer (as replacement for [REDACTED] previous role), departure from the business of the former Deputy Chief Designer Systems ([REDACTED]) and nomination of a single Deputy Chief Designer [REDACTED] previously Head of Avionics.

MADG was aware of need to advise MAA of these changes, as all nominated personnel were already listed on the DAOS certificate (albeit in different roles) their certification authority under DAOS was not intended to change so this was not raised as a CAR.

MADG tabled draft Exposition Exposition at Issue 13 as evidence that preparation work was in process to formally advise MAA. MADG explained that the revision is also intended to address introduction of SMS as an ICAO annex in the civil environment and to include the DAOS activity within the document rather than as a stand-alone document due to the commonality in the MADG approach to showing compliance.

Note: In offline review of the submitted document it was noted that the draft change includes statements that the Engineering Director, Chief Designer and Chief Airworthiness Engineer all have added authority to their current Terms of Reference that they have [REDACTED]. While this may be the case related to ICAO Civil aspects such responsibility in the DAOS context is understood to rest with the TAA – in intending to move to a combined document MADG should take care to ensure that the differing responsibilities within the civil and military sectors are adequately reflected.

MADG noted to retain its previously advised EN9100 Rev C approval status.

Review of CARs

Status of CARs remaining from previous surveillance activity at Cambridge was reviewed as below. Noted that all external audit findings are entered onto Business Management System with status and actions tracked via Q-Pulse and subject to quarterly management reports:-

Letter from MAA presented dated 18th June 2014, responses to CAR 1 and 2 responded to, CAR 1 closed, CAR 2 remaining open.

Review of current status as follows:-

4Q12/02 Amended procedure confirmed as issued and available via BMS -
Closure confirmed.

UK.MAA.DAOS.153.2013/CAR1 – Repairs, Interface with Aircraft Design Organisation

Notified as closed by MAA in letter dated 18th June 2014.

Details of work undertaken to close out identified action referenced as RTI/HERC/298A. Report signed off showing that tasking was completed – as it could not be confirmed that the original specified NDI inspection had been carried out a repeat tasking was raised, report of this inspection (carried out by RAF service personnel) was presented to team as evidence.

It was noted that the NDI report was "PP'd" and it was not possible to confirm the authority of the signatory but as this has been issued directly by the RAF it was felt that MADG had taken all reasonable steps.

Use of 'pp' signature is advised to MAA and a scanned copy of the document attached to the electronic version of this report.

Closure confirmed.

UK.MAA.DAOS.153.2013/CAR2 – Exceptions and Limitations
MADG advised that closure evidence (formal issue of final C of D) had recently been provided to MAA. At present the CAR is still considered open.
POST AUDIT NOTE: The MAA have no record of receiving this information.

Open as stated by MAA

With regard to the observations it was seen that they were closed internally by MADG but evidence had not been provided to MAA with the Level ■ CARs.

MADG were reminded that observations also need to be addressed, status was reviewed and recommended positions as follows:-

UK.MAA.DAOS.153.2013/OBS1 – Checking responsibility for C of D
Further detail added as to expected checking activity by Board and Engineering signatories.
Action to address observation noted.

UK.MAA.DAOS.153.2013/OBS2 – Training records
Assignment of engineering authorisation instruction updated per form 04-12000-05 Assignment of Engineering Authority. Recommendation is a result of a review of the evidence presented by the nominated personnel by the approving manager, with "sufficient information shall be included in justification section of Part 3 to provide evidence of thorough review of applicant".
Action to address observation noted.

UK.MAA.DAOS.153.2013/OBS3 – Documents defining C130 design standards. This was closed internally on the basis that availability of the referenced C130J PMP documents was demonstrated, [REDACTED]

Once this element is addressed then closure can be recommended

Staffing and Competency

[REDACTED] presented means to manage the staffing resources via MADG toolset involving Sales and Resource Planning and Tactical Resource Planning, which involves core Shared Service activity and then allocation to individual working Project Teams. This was demonstrated via the applicable section of the MA Engineering Intranet.

Resource availability across specialist areas, projected overtime rates and shortfalls with potential effect on project delivery are monitored on a monthly basis via the Engineering Services SRP spreadsheet (reviewed for September 2014) identifying the expected resource necessary for all business units. Bar charts presented for each "shop" with expected workload (demand) against expected resource with O/T and sub-contract staff availability to match additional need as required.

Tactical resource planning data was presented identifying all organisation engineering resource and current allocations; this was mapped against a weekly framework against predicted work and subject to refresh monthly. Strategic plans identify business/project needs to be met to support the work in hand and the tactical plans identify the way in which the daily resource is allocated and matched to the "need".

With respect to staff authorisations, records were checked for modifications sampled below and all found correct with reference to the current Authorisation Signatory list as referenced in support of the DAOS Exposition.

Safety Management System (RA1200)

Addressed in depth during previous surveillance, during discussions MADG aware of current developments with regard to Def Stan 00-56 developments. Organisation continues to demonstrate appropriate level of knowledge, understand use of MOD reporting systems such as DASORs etc.

Design Activity

Marshall had previously advised recent design activity as part of the preparation for the audit, the most significant modifications for which were installation of FLARM on the Viking glider fleet and obsolescence management/upgrade of the Operation Loads Measurement (OLM) for the C-130 and these were selected for detailed review.

VIKING T MK1 FLARM INSTALLATION - M037

At this point the audit was supported by [REDACTED] - Design Engineer Principal 1, Military Mods/Minor Mods Group and the detail of the substantiation documentation and certification documentation for this and the following modification was reviewed by [REDACTED]

Background: Installation is based on an EASA Service Bulletin

Contract Number TRGACC/3026

Task PDSA 470 - 163/1324

- requires a MOD form 714
- Formal installation drawing
- Mod added to MRI
- Raise draft mod leaflet
- Raise supporting Marshall ADG Modification documentation.

Letter of Initiation for Mod M037.

- Certification basis is CS22 Amdt 2 (as stated in Def Strn 00-970). All signed off by [REDACTED] of MADG

Modification Proposal Form

- Identification of modification objectives... etc

Project Development Plan

- Certification requirements refer to EASA 10036987; safety assessment reflects installation of equipment only and not functional performance.
- Quality assurance is in accordance with AS9100
- Software for obstacle clearance not developed iaw DO-178.
- Safety and compliance restricted to producing a safety statement only; [REDACTED]
- [REDACTED]

CofD Form 100C

CD/VIKING(M037)/14/0426 Issue 1

- Declares that this meets the requirements of CS-22 Amdt 2
- Para 6 declares that a safety case has been prepared, [REDACTED]

- [REDACTED]

The absence of a limitations and exceptions listing per list 1 of the Certificate of Design implies that there are no exceptions to the declarations made on page 1 of the certificate, including (full) compliance with CS22 and the provisions of a full safety case.

[REDACTED]

[REDACTED]

[REDACTED]

It was not clear whether the customer had accepted that compliance would be shown to an earlier standard than that implied by the contract and as declared on the CofD. A meeting between MADG and the customer was advised so that this situation could be presented.

ER/VIKING(M037)/14/0400 is a compliance report for the overall modification project identifying the certification basis, description of change and safety statement, along with the means of compliance and annexes.

A review of the referenced service Bulletin identifies that the requirements met were not those of CS22 but MADG stated that they had compared these against CS22 to use these to support compliance with CS22, but evidence of this comparison could not be shown.

Reference is made to the safety statement being presented within the type record ER/VIKING(M037)/14/0427. This was presented and seen to only refer to the equipment being fitted in accordance with the SB.

The compliance report Annex lists the SB paragraphs (from the original LBA authorisation) including those for GPS and ELTs etc, and identifies those that are identified as applicable, but the statements of compliance against CS22 necessary to show that the requirements that had been satisfied could not be shown.

The audit was joined a this point by [REDACTED] Design Engineer – Principal 1, Group leader Avionics, Military Mods/Minor Mods group for further discussions regarding the certification basis.

[REDACTED]

[REDACTED]

[REDACTED]

• [REDACTED]

[REDACTED]

NB: The equipment has not been assessed as suitable for this type of aircraft and only provided with statements of compliance to aspects of LBA letter 31-315/80 and Grob Service Bulletin 06-09-2011 and Instructions 06-09-2011. As a result the installation is therefore potentially as airworthy as all other Grob FLARM installations, apart from the [REDACTED].

Contract content, once presented by MADG (on Day 2 following provision from records):

- Contract Number TRGACC/3026 Amendment 15, 17th Sept 2012
- Task PDSA 470 - 163/1324
- Refers to RA5000 Series
- Quality Assurance stds called up include Def Stn 05-91 and 05-61 and JARs 22 and 23
- PDS contract calls 05-123, reflecting the 2000 original date. References were seen to provision for F100As as necessary.
- Reference seen to use of JAR22 and 23 as appropriate specifications for use with this contract.
- The name of the project manager within the contract appendix has been superseded; MADG confirmed the current Project Team contact: [REDACTED] - Glider Tech' support manager; [REDACTED] - Glider Eng' authority.

The Certificate of Design F100C CD/VIKING(M037)/14/0426 Issue 1 and presented supporting data for the installation of FLARM to Grob Viking aircraft was sampled. The following was noted:-

1. [REDACTED]
2. No CofD F100A or other supporting equipment authorisation documentation for the GFA could be shown

3. [REDACTED]
4. No evidence could be shown to support compliance against the declared certification basis.
5. [REDACTED]
6. An instruction to remove the FLARM obstacle clearance data is included within the installation drawings, but agreement from the customer to remove this functionality was not evident.
7. The Project Development Plan was seen to state that the project manager is to be advised of the installation manual cautions regarding software updates, but evidence of how this had been communicated was not shown.

CAR UK.MAA.DAOS.153.2014/CAR1 refers.

In addition, it was recommended that MADG meet with the PT to advise them of the situation and enable them to make the decision as to whether the lack of compliance evidence is acceptable based on the non-airworthiness significance of the system function.

Day 2 - Sample of Design Activity (Continued)

MA2076 – C-130J; Operational Loads Measurement (OLM) Upgrade

During the subsequent review the audit was supported by [REDACTED] Senior Flight Test Instrumentation Engineer and later in the review [REDACTED] – Chief Engineer Military Modifications.

Certificate of Design CD/C130J(2076)/14/0276 Issue 1

- CSR Reference Modification MA [REDACTED]
- Contract Number HERCJ/[REDACTED]
- Type Modification Record Reference TR/C130J92017/14/0277 Issue 1
- Specification Def Stn 00-970 Issue 3
- A safety case has been prepared
- Nothing provided in Lists 1, 2 or 3. No Exceptions and Limitations; No flying performance Characteristics that have not been demonstrated by flight test and no flight test reports.

[REDACTED]

Letter of Initiation signed by chief engineer 4 April 2014.

Programme Development Plan PDP/HERC/13/0959 Issue 1

A System safety analysis is produced (or safety assessment) to address the installation aspects whereas the SSA of initial modification (MA [REDACTED]) identified that the overall system will have "no safety effect".

Final page lists document deliverables, some with identification of the level of sign off, but others' sign off marked as N/A. MADG declared that this is because these have specific sign-off requirements per the MADG procedures (CofD, Type Record, Stress Calculations, Weight and balance statement, Tech pubs updated). Procedure for document sign off referenced from 00-01-E0002 Engineering Organisation Exposition.

It was noted during this review that MADG had recently amended its procedures requiring sequential sign-off of Engineering Reports by the appropriate disciplines to a simultaneous peer review process ([REDACTED]). It was not apparent from review of this process how it is ensured that documents were approved by the required disciplines prior to the project advancing to the next stage.

CAR UK.MAA.DAOS.153.2014/OBS1 refers.

Safety Assessment ER/C130J/(2076)/14/0248 Issue 1

Assessment considers changes made to original modification for OLMS; safety assessment considers 00-56 and AMC25.1309, but means by which AMC25.1309 could be considered as a part of the contract were not evident. However, as a part of the process, this does not seem to have impacted the result that focuses on the output of the change introduced.

Limitations and conclusions limit the applicability of the change to two aircraft [REDACTED] and [REDACTED].

It was noted that the version of 00-56 referenced was Def Strn 00-56 Issue 5 Feb 2014, although the contract referenced issue 4.

Certification and Test Plan ER/C130J(2076)/14/0170 sampled with no comments logged as a result.

Certification and Compliance Report ER/C130J(2076)/14/0175 sampled, noting that compliance evidence is listed alongside the relevant 00-970 paragraphs.

Environmental qualification per 00-970 listed in Annex C of the report: Qualification of new circuit cards by similarity; qualification of new recorder undertaken using RTCA DO-160G environmental qualification rather than contracted Mil Specifications (e.g. MIL-STD-810 and 461), but an equivalent level of qualification suggested "by similarity" implying that the qualification test is equivalent to that specified, but this "exception" from the contracted technical specification was not seen to be contractually declared. No F100A was presented for the new equipment that was to be installed under the presented F100C, so the exceptions referring to this aspect were not consistently declared.

MU4-82-0114 Mutual Interference test undertaken to satisfy EMI

requirements in addition to equipment qualification that did not lists RF emissions as an environmental qualification test. Procedure is a template procedure for the C-130J and deemed appropriate for the data presented.

Technical Requirements Document (TRD) for modification 2076 U4-09-0030, presented as the controlling document between MADG and the equipment supplier to manage supply and qualification of parts; a DDP is provided to present the qualification status of the equipment, but the required declarations are not in accordance with the contracted TRD (Mil Stds), but have been accepted.

Quality Systems – for approved suppliers identifies equipment supplier [REDACTED] and sampled July 2013 supplier audit record. Organisation does not hold test house accreditation so the authorisation of the DDP presumably relied on subcontracted test data to support the environmental declaration.

[REDACTED]

A qualification test declaration (Reference HW/BK/0019 9 May 2013) was presented but this was not signed and the referenced test certificates were not available for view at the time of audit. The authority supporting the test statements was therefore not shown to be authorised by the company, so the means to show that the declarations were made under the company's quality assurance system could not be shown.

The equipment assessment process needs to ensure that all statements are fully verifiable.

Conclusions from Design Sample:-

In both cases sampled, MADG had undertaken qualification responsibilities for incoming equipment.

In the case of the FLARM project, this was stated to be GFA equipment [REDACTED]

In the case of the OLM, the equipment was MADG specified but provided by an external organisation. Evidence of flow-down of DAOS Subcontractor control requirements as specified by 05-123 was demonstrated (confirmation of receipt and understanding being sought at time of audit.)

[REDACTED]

[REDACTED]

From this it is concluded at an overall MADG internal review of procedures for the specification and qualification of externally sourced equipment in support of MOD projects is required.

CAR UK.MAA.DAOS.153.2014/CAR2 refers.

Internal Audit and Quality System

Review of the internal audit records was undertaken with the support of [REDACTED]. In response to previous findings in this area internal audits were noted to be carried out using a high-level checklist showing reference to the DAOS requirements and with specific projects reviewed both for individual design tasks and repairs. Allocation of specific resource has maintained improvement noted during previous surveillance.

Closing Meeting

A formal Closing Meeting was conducted with the audit participants, including a summary presentation of the intended CARs via Powerpoint, a copy of which has been provided at the same time as the preparation of this report. The maturity level that the organisation's electronic records system has now reached and ease of retrieval was particularly noted during the visit and commented positively upon during the closing meeting.

Summary of each finding	UK.MAA.DAOS.153.2014/CAR1 Level [REDACTED] Non-Compliance - Interface with Aircraft Design Organisation UK.MAA.DAOS.153.2014/CAR2 Level [REDACTED] Non-Compliance - Exceptions and Limitations UK.MAA.DAOS.153.2014/OBS1 Observation Non-Conformance - Checking Responsibility for Certificate of Design		
Other issues requiring attention	As advised in Executive Summary/Recommendation the lack of available substantiation data for FLARM may extend beyond the sampled Viking platform into other service aircraft (known to be installed on at least part of the BBMF fleet, for example).		
Completed by	[REDACTED]	Date	14 th November 2014
Approved for release by	[REDACTED]	Date	18 Dec 2014

Military Aviation Authority



Design Approved Organization Scheme

**Marshall of Cambridge
Aerospace Limited
08 November 2016**

Audit Report

~~Handling Instruction: Commercial in Confidence~~

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Scheme: DAOS

Approval Ref: UK.MAA.DAOS.0153

MAA AUDIT REPORT					
Organization	Marshall of Cambridge Aerospace Limited				
Site(s)	Cambridge				
Audit Dates	08 November 2016				
Audit Title	DAOS Revision				
Reference	MAA_16_DAOS_0153_1				
Audit Scope, Criteria and Objectives	<p>Scope</p> <p>To extend the Marshall of Cambridge Aerospace Limited (Marshall) DAOS scope of approval to include:</p> <ol style="list-style-type: none"> Privileges to classify and approve Minor Design Changes to the Hercules C-130J Platform. Post Design Services (PDS) for the Dakota Mk3F aircraft (tail number [REDACTED]). <p>Criteria</p> <p>The audit examined Marshall against their internal procedures and the DME5000 series for the Dakota and TAE5000 RA's 5820, 5850 and 5865 for the privileges.</p> <p>Objectives</p> <ol style="list-style-type: none"> To gain evidence that Marshall have implemented procedures that will comply with RA's 5820, 5850 and 5865 for design change privilege. To gain evidence that Marshall are competent to carry out PDS for the Dakota aircraft. 				
MAA Audit Team	[REDACTED]	Role	Lead Auditor	Post	MAA-OA- DAOS4
	[REDACTED]	Role	Auditor	Post	MAA-OA-DAOS3
MAA Observer	[REDACTED]	Role	Observer	Post	MAA-CERT-MPS3a
Principal Auditee(s)	[REDACTED]	Role	Marshall – Chief Airworthiness Engineer		
	[REDACTED]	Role	Marshall – Airworthiness Support Group Manager.		
	[REDACTED]		DE&S C-130J Configuration and CAMMS Manager		

<p>Executive Summary</p>	<p>The process developed by Marshall to classify and approve Minor changes to the UK MOD C-130J platform meet the requirements of TAE5000 RA's 5820, 5850 and 5865 for the exercise of privileges.</p> <p>Marshall used their experience of applying privileges under their civil EASA Part 21 Subpart J approval to develop the process for the UK MOD platform. They also ensured the TAE5000 requirements were included in the process.</p> <p>The DE&S C-130J PT had developed a process that dovetailed into Marshall process to ensure oversight and delivery of modifications when privileges are invoked. Certification of modifications carried out under privileges will be certified in accordance with RA5103.</p> <p>Marshall had access to the Dakota platform data and had in house experience to satisfy the PDS requirements of the DE&S FAST PT contract.</p> <p>No Corrective Actions or Negative observations were raised.</p>			
<p>Recommendation</p>	<p>It is recommended that:</p> <ol style="list-style-type: none"> 1. The DAOS scope of approval is extended to include privileges to classify and approve Minor Modifications and Repairs to the Hercules C-130J platform when invoked by the C-130J TAA and when the following conditions are met: <ol style="list-style-type: none"> a. Formal issue of the process for Classification and Approval of UK MOD Modifications and Repairs. b. Training on the above process is given to relevant Marshall personnel. 2. The DAOS scope of approval is extended to include PDS activity for the Dakota platform. 3. The next DAOS surveillance audit should test the live application of the privilege and the Dakota PDS activity. 			
<p>Number of Findings</p>	<p>Non- Compliance</p>		<p>Non- Conformance</p>	
	<p>Level 1</p>		<p>Level 1</p>	
	<p>Level 2</p>		<p>Level 2</p>	
	<p>Observations</p>			
	<p>Negative</p>		<p>Positive</p>	
<p>Audit Content</p>	<p>Audit Methodology</p> <ol style="list-style-type: none"> 1. The auditors reviewed the Marshall process to be used for the extension to design change privilege for the RAF Hercules C-130J platform. The auditors also discussed with Marshall the type of PDS activity they were carrying out on the Dakota aircraft. 			

Introduction

2. The audit was conducted using the published audit plan and commenced with an opening meeting.

Opening Meeting

3. Attendees at the opening meeting were as follows:

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

C130J Privilege Documentation Review

4. Marshall explained that a new process had been produced to meet the MRP requirements for privileges but was currently in draft format. A step through the Business Management System (BMS) Process Planning tool was given showing the draft process reference BMS1174 titled Classification and Approval of UK MOD Modifications and Repairs. The first part of the process was to complete a UK MOD Modification/Repair Checklist.

5. Marshall presented 2 'DRAFT' checklists for classification of changes, both of which mirrored the requirements of the relevant TAE5000 Regulatory Articles requirement as follows:

- a. [REDACTED] issue 1 titled UK MOD Modification Classification Checklist referencing RA5820(1).
- b. 21-01-F07701 issue 1 titled UK MOD Repair Classification Checklist referencing RA5865(4).

6. The DE&S C130J PT representative provided and stepped through the PT's C-130J Modification Process (reference Appendix 006 to HIOS interface document, interface 011-A006, Issue 1 dated May 16) which was seen to dovetail the Marshall process.

7. Modifications carried out under privileges will still be certified using an MAA Form 100 Certificate of Design in accordance with RA5103.

8. Marshall stated that the implementation of the process would take place over the next 6 months. The process will be communicated to the shop floor via a 'Reading Log' on the BMS. The log will contain a voting button (including comments facility) which will record personnel who have read the log. There will also be training sessions on the new process.

9. Marshall Quality Department carries out internal audits on the MAA Regulatory Publication requirements for their DAOS approval. Therefore when the new process is formalised it will be included in the audit schedule.

10. Marshall currently hold privileges under their civil EASA Part 21 Sub Part J approval and although the process for non UK MOD aircraft differs, an example of a civil modification was provided to show process

adherence. The following was presented with no issues identified.

a. Modification/Repair Classification Checklist reference [REDACTED] Issue 2. Modification Number MA [REDACTED] for Aircraft Type B747-400F titled CargoLogic Air B747-400F Change of Ownership.

(1) The Checklist referenced the civil requirements for classification of Major/Minor and the completed list classified the modification as Minor.

b. Engineering Report ER/B747(2251)/15/0557 titled Compliance Report for CargoLogic Air B747-400F Change of Ownership.

(1) The report included a list of approved signatories and Certification Verification Engineers (CVEs). These signatories were checked and confirmed against the lists held within the BMS.

Dakota PDS review

11. A discussion was held regarding the level of work currently undertaken to support the Dakota platform under contract with DES FAST PT (reference FAST 00137).

12. The bulk of the tasking was to manage MOD Form 765's for changes to the aircraft Topic 5 series publications. It was stated that MOD Form 765 reviews were carried out at 3 monthly intervals.

13. Changes will be certified using current DAOS approved signatories.

14. In 2010 Marshall purchased a complete Dakota Mk3F platform drawing set. Recognising Boeing as the platform Type Certificate holder, Marshall have subscribed to the FAA and therefore has access to any required data. It was stated that Marshall also attend the platform Fatigue Integrity Meetings.

15. It is recommended that Dakota is added to the DAOS scope of approval and the PDS activity tested at the next DAOS surveillance audit.

Other Issues Requiring Attention

Completed By

[REDACTED]

Date

13 Dec 16

Approved For Release By

[REDACTED]

Date

19 Dec 16



Defence
Safety
Authority

Design Approved Organization Scheme

Marshall of Cambridge Aerospace Ltd
18 – 19 October 2017

UK.MAA.DAOS.0153

Military Aviation
Authority

Audit Report

Military Aviation Authority

MAA

Handling Instruction: Commercial-in-Confidence

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MAA AUDIT REPORT	
Organization	Marshall of Cambridge Aerospace Ltd
Site(s)	The Airport, Cambridge, CB5 8RX
Dates	18 – 19 October 2017
Title	DAOS Surveillance
Reference	MAA_17_DAOS_0153_1
Audit Objective, Scope and Criteria	<p>Objective</p> <p>1 To verify the continuing design competence and capabilities of Marshall of Cambridge Aerospace Ltd (MCA) in accordance with DAOS approval (reference UK.MAA.DAOS.0153) dated 3 May 17.</p> <p>Scope</p> <p>2 Review design tasks conducted by the organization since the last assessment (Oct 14) to gain evidence of compliance with MAA Regulatory Publications to undertake the functions of a Design Approved Organization in accordance with RA 5850.</p> <p>Criteria</p> <p>3 The surveillance was undertaken against the TAE RA 5000 series, RA1200, Def Stan 00-056, Def Stan 05-057 and internal procedures.</p>
Executive Summary	<p>Summary</p> <p>4 Marshall of Cambridge Aerospace Ltd had maintained currency, competency and awareness of changes to the DAOS requirements although it had not issued any DAOS Certificate of Design following the implementation of the TAE RA 5000 series. [REDACTED] findings were raised relating to:</p> <ul style="list-style-type: none"> a. Retrieval of the design records; this was consistent to both of the projects sampled. b. Supporting evidence to statements within the Certification Summary and Stress Report. c. Modification assessment. <p>Recommendation</p> <p>5 It is recommended MCA DAOS approval is retained against DME RA 5101 and uplifted to TAE RA 5850 following submission to the MAA of an acceptable Corrective Action Plan.</p>

Handling Instruction: Commercial-in-Confidence

Number of Findings	Non- Compliance		Non- Conformance	
	Level 1		Level 1	
	Level 2	■	Level 2	
	Observations			
	Negative	■	Positive	
Audit Content	<p>Audit Methodology</p> <p>6 To test the application of MCA internal processes and procedures, the assessors reviewed a representative sample of repairs from the list provided by the organisation prior to the audit.</p> <p>Introduction</p> <p>7 The audit was conducted using the published audit plan and commenced with an opening meeting with MCA Management personnel and the audit team.</p> <p>Opening Meeting</p> <p>8 Attendees at the opening meeting were as follows:</p> <ul style="list-style-type: none"> a. ■ - Chief Airworthiness Engineer b. ■ - Quality Manager Engineering and Manufacturing c. ■ - MAA Audit Team Leader d. ■ - CAA Airworthiness Surveyor e. ■ - Engineering Director (Closing Presentation) <p>Review of Previous Findings (RA 5850(8))</p> <p>9 There were no open Corrective Action Requirement (CAR) or previous CAR closure verification requirements.</p> <p>CURRENT AND PROJECTED TECHNICAL ACTIVITIES</p> <p>DAOS Approval Scope (RA 5850(6))</p> <p>10 MCA confirmed the current scope was valid and that there were no other changes that affected the current approval. MCA had notified the MAA that they were going through a restructuring programme, the position ■ will be affected by the restructuring.</p> <p>11 MCA were advised to notify the MAA when the restructuring affecting the Approved Signatories had been formalised.</p> <p>12 The auditors requested an updated Form 4 for Mr ■ (Board Member). The audit team were informed that Mr ■ was not an active board member and was soon to leave the organization. MCA were reminded of the requirement to notify the MAA of changes to identified signatories. Negative Observation.</p> <p>Contracts</p> <p>13 Contract Number HERCJC/00041 – Hercules Integrated Operational Support (HIOS) was current between C-130J Project Team and MCA. It</p>			

detailed within the UK DAOS Supplement Paragraph 2.2 "To meet RA 5820 the classification of changes to type design as Minor or Major and approval of Minor changes to type design is provided within BMS1174 Classification and Approval of UK MOD Modifications and Repairs".

26 No reference was made to the presentation of MAA MOD Form 30 (Application Form for Military Type Certificate (MTC) or Changes in Type Design), providing detail of the recorded decisions together with the supporting documentation that relates to the modification certification to the TAA for configuration control.

Finding MAA_17_DAOS_CAR_0153_1

27 [REDACTED]

28 [REDACTED] The supporting evidence was quoted as [REDACTED] Certification Summary. There were no stress calculations contained within or referenced out from [REDACTED] Certification Summary.

Finding MAA_17_DAOS_CAR_0153_2

Design Task 2 – C-130J Modification

MA [REDACTED] RAF C-130J [REDACTED]

29 A further modification was selected at random to view the final Certification Summary to isolate or identify a possible trend.

30 A review of MOD MA [REDACTED] Certification Summary [REDACTED] was conducted. Paragraph 3 stated "[REDACTED]" No evidence was produced to support this statement.

Finding MAA_17_DAOS_CAR_0153_2

Design Task 3 – C-130J Repair

MA [REDACTED] Repairs to [REDACTED] – Primary Plus Maintenance – [REDACTED]

31 A review of repair MA [REDACTED] was conducted against MCA process [REDACTED]. The terminology 'MA' was used as a prefix against modification or repairs with the term modification being common through the documentation for the repair reviewed.

32 [REDACTED]

33 Repair MA [REDACTED] Certification Summary [REDACTED] was reviewed; it was identified that the Certification Summary was not at the latest issue; the viewed document was signed by the [REDACTED] and the [REDACTED].

34 A comparison of [REDACTED] Certification Summary for design

tasks reviewed identified preparation dates and issue numbers as detailed:

a. Certification Summary ([REDACTED]) for MA [REDACTED] was at issue 2.01 prepared 28 Jun 17.

b. Certification Summary ([REDACTED]) for MA [REDACTED] was at issue 3 prepared 11 May 17.

35 The Certification Summary for the reviewed designs had been prepared by different personnel; both were signed by the [REDACTED] and the [REDACTED].

Finding MAA_17_DAOS_CAR_0153_3

[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]

Finding MAA_17_DAOS_CAR_0153_4

Design compliance with the specification (RA 5850(3))

37 Not Compliant: A review of the sampled modification and repair identified a short fall in meeting the requirements within the Certification Summaries and Stress Report.

Independent airworthiness scrutiny undertaken (RA 5850(3))

38 Not Reviewed: MCA had been granted Privilege by the C-130J TAA to classify and approve modifications and repairs to C-130J. MCA confirmed that Privilege had not been invoked on modifications or repairs prior to the date of surveillance.

Control and Custody of Design Data (RA 5850(12))

39 Not Compliant: MCA were unable to demonstrate and retrieve auditable design records (demonstration on Day 1 was unsatisfactory, this improved when the [REDACTED] was retrieving documentation). On day 2, a [REDACTED] was unable to locate design artefacts at time of request. The subject artefacts were found before the completion of surveillance and were accepted as evidence.

Finding MAA_17_DAOS_CAR_0153_5

Develop and Maintain Approved Data (RA 5850(13), 5401)

40 Compliant: Certification Summary included 'Aircraft Manuals and Operational Suitability Data' statement detailing an evaluation of possible changes to aircraft manuals.

Provision of Maintenance Data (RA 5850(13), 5320)

41 Not reviewed during this assessment: The provision of maintenance data was not covered within the scope of this surveillance.

Design Suitable for Production (RA 5850(4))

42 Compliant: A supplementary Exposition was provided identifying the additional procedures to meet the requirements of the MRP in addition to those outlined in MCA extant EASA Exposition. Minor comments were raised with MCA to address when the [REDACTED] is next uplifted.

Documentation Provided to Certify Design (RA 5103)

43 Not Compliant: A CofD was viewed for Design Task 1 and 2. The CofD for both designs were compliant however; the associated documentation to support the CofD for both designs contained discrepancies.

Investigation of Design Related Occurrences (RA 5805)

44 Compliant: No DASORs had been raised against Repair Designs or Modifications. An example was provided where MCA raised [REDACTED]. This was to raise the awareness to the Main Operating Base regarding the incorrect compilation of Form 702 Weight and Balance Recording.

Design, Develop and Prepare Modifications (RA 5820)

45 Not Compliant: A review of the sampled modification identified a short fall in meeting the requirements within the Certification Summaries and Stress Report.

Design, Develop and Prepare Repairs (RA 5865)

46 Not Compliant: A review of the sampled repair identified a short fall in meeting the requirements within the Certification Summaries and Stress Reports.

DESIGN AND RELATED SUPPORTING COMPANY STRUCTURE AND FACILITIES

Quality Management System (RA 5850(2))

47 Compliant: AS9100 approval was held via Association Française de Normalisation (AFNOR), the French national organization for standardization, this was referenced within the submitted Exposition. MCA were in the processes of transition to Revision D of AS9100 standard. This requirement was to be completed before Apr 18 for MCA to maintain AS9100 certification.

48 The Apr 17 AFNOR audit raised [REDACTED] Non Conformance Reports (NCR), none were classified as Major. A sample review of the NCR was conducted through MCA electronic quality management system, Q-PULSE. All [REDACTED] NCR had been closed internally by MCA with the closure accepted by AFNOR on a follow up visit 10 Aug 17.

Safety Management System (SMS) (RA 1200)

49 Compliant: MCA explained the journey that been undertaken, with the support of [REDACTED], to their current position. Using the [REDACTED] System (Flowchart Analysis of Investigation Results) for investigation of Human Error and Just Culture, MCA had [REDACTED] trained Event Investigators.

50 An Open reporting culture was encouraged through the MCA intranet with all occurrences raised being investigated. The investigation provided data for trend analysis enabling targeted follow up training.

51 MCA demonstrated the Risk register as a matrix with a common approach across the organization. This provided a detailed, quantifiable explanation for each level of risk within Business (Finance, Commercial) and Engineering, with the respective risk receiving an identical rating.

Control Of Subcontractors (RA 5850(3))

52 Not reviewed during this assessment: The Control of Subcontractors was not covered within the scope of this surveillance.

Handling Instruction: Commercial in Confidence

	<p>Facilities (RA 5850(5))</p> <p>53 Compliant: Working conditions were commensurate with the activity noted during the surveillance audit. MCA stated that the design office was to be re-located within the main site.</p> <p>QUALIFICATIONS AND EXPERIENCE OF RELEVANT STAFF</p> <p>Competence, Training and Resources (RA 1200, 5850(5))</p> <p>54 Not Compliant: Compliance Verification Engineer (CVE) selection was reviewed against [REDACTED]. The end to end process was defined and suitable however, it was not clear to the auditors what minimum level of education was required for the position of CVE. [REDACTED] stated [REDACTED]. Negative Observation</p> <p>55 A wide-ranging review of training and resources was not conducted. MCA had notified that the organization was under taking a transformation of the business.</p> <p>Approved Signatories (RA 1200, 5850(4))</p> <p>56 Compliant: the sampled documents were cross referenced against the signature matrix, no anomalies were identified.</p> <p>Closing Meeting</p> <p>57 A Formal Closing Meeting was conducted with key audit participants, including a summary presentation of the findings.</p>		
<p>Follow Up Action</p>	<p>Corrective Action Plan (CAP)</p> <p>58 A CAP is to be received by the MAA:</p> <p>a. Level 1 - No later than 10 working days from notification (measured from dispatch of Corrective Action Requirement (CAR) from MAA); assuming that continued operation is considered to remain within extant tolerable and ALARP limitations.</p> <p>b. Level 2 - No later than 20 working days from date of CAR dispatch from MAA.</p> <p>c. The CAP should address the following points for each CAR, supported by appropriate evidence:</p> <p>(1) Identification of root cause through in-depth analysis.</p> <p>(2) Implementation of corrective actions.</p> <p>(3) Implementation of preventative actions.</p>		
<p>Other Issues Requiring Attention</p>	<p>59 MCA to notify the MAA of any changes to nominated signatories within the DAOS Schedule following the outcome of the [REDACTED].</p> <p>60 An uplift to Document [REDACTED] DAOS [REDACTED] will be required following the business transformation.</p> <p>61 Future DAOS surveillance audit to review MCA activity within their area of responsibility for the Viking platform.</p>		
<p>Completed By</p>	<p>[REDACTED]</p>	<p>Date</p>	<p>5 Dec 17</p>
<p>Approved For Release By</p>	<p>[REDACTED] [REDACTED]</p>	<p>Date</p>	<p>5 Dec 17</p>

Handling Instruction: Commercial in Confidence

Annexes:

- A. MAA Team composition and list of Principle Auditees.
- B. Documents made available for MAA Audit.

MAA AUDIT TEAM COMPOSITION AND LIST OF PRINCIPLE AUDITEES

MAA Audit Team	[REDACTED]	Role	Lead Auditor	Post	MAA-OA-DAOS1
	[REDACTED]	Role	Auditor	Post	CAA Airworthiness Surveyor
Principal Auditees	[REDACTED]	Role	Chief Airworthiness Engineer		
	[REDACTED]	Role	Quality Manager Engineering and Manufacturing		
	[REDACTED]	Role	CE – Sustainment		
	[REDACTED]	Role	Stress CVE		
	[REDACTED]	Role	Head of Safety		
	[REDACTED]	Role	HSE Manager		
	[REDACTED]	Role	Airwothiness Consultant		
	[REDACTED]	Role	Senior Design Engineer		
[REDACTED]	Role	QA Team Leader			

DOCUMENTS MADE AVAILABLE FOR MAA AUDIT

Document Title	Date	Issue
[REDACTED]		
HERCJC/00041- Hercules Integrated Operational Support – Amendment No 281	10 Oct 16	
DESC130J/04/02/32/2006/06/16 – NLG Lanyard Uplock Support Tube	02 Jun 16	
RAF C-130J Modification Process Appendix 007 to HIOS Interface Document No Interface 011-A007	Jun 16	1
Certificate of Design CD/C-130J(2361)/16/0854 (MAA F100C – BMS0489-F02)	5 Jun 17	2
Certification Summary [REDACTED] ([REDACTED])	11/05/17	3
Certification Summary [REDACTED] ([REDACTED])	22/09/16	2
Certification Summary [REDACTED] ([REDACTED])	28/06/17	2.01
Report CALC/C-130J(2457)/17/0468 (03-02-F3002-10 A4 Issue 3)	27/Jun/17	1
Assignment of Engineering Authority ([REDACTED])		3



Deputy Head of Oversight and Approvals 2
Military Aviation Authority

Juniper 1, Wing 4, #5104
MOD Abbey Wood (North)
Bristol BS34 8QW

Military Network: [REDACTED]

Telephone: [REDACTED]

Email: [REDACTED]

www.maa.mod.uk

Marshall of Cambridge Aerospace Limited,
The Airport,
Newmarket Road,
Cambridge,
CB5 8RX

Reference: UK.MAA.DAOS.153

Date of Issue: 10 October 2013

Date of Expiry: 02 September 2016

DESIGN APPROVAL CERTIFICATE FOR MILITARY AIRCRAFT AND AIRBORNE EQUIPMENT

1. This certificate recognises the organization's capability for the design, development and certification of the following products and services under contract with the Ministry of Defence (MOD):

- a. Modifications and special installations in fixed wing aircraft.
- b. Modifications and special installations in Viking Glider aircraft.
- c. Modifications and special installations in helicopters.
- d. Special test and support equipment for items a, b and c.
- e. Flight testing. Authorised flight testing is limited to: Quantitative assessment of aircraft performance and avionics and engineering systems on fixed wing aircraft.

2. The following conditions apply to this certificate:

- a. Where the aircraft structure is affected, or where there is installation, integration or modification of equipment or aircraft systems, any limitations prescribed by the Aircraft Design Organization for structure, aerodynamics, weight, centre of gravity, and systems (including software) must be respected. Designs shall not transgress such limitations without the written technical agreement of the Aircraft Design Organization, and/or the MOD Project Team Leader (TL) for the aircraft concerned.
- b. The Aircraft Design Organization shall be consulted if the installation or modification affects primary structure, primary controls, primary instruments or displays, or the external shape of the aircraft, including stores.
- c. Where relevant design documentation cannot be obtained from the Aircraft Design Organization/OEM or where consultation is considered not to be required, then any potential impact on Safety or Airworthiness shall be assessed and fully documented. This responsibility will rest with the recognised design signatories. The TL for the aircraft concerned shall be informed in all such cases.
- d. All changes to the aircraft build standard shall be forwarded to the Aircraft Design Organization for configuration management purposes.

3. Overall responsibility for the Design Organization rests with:

██████████ – Managing Director

And for flight test operations with,

██████████ – Director of Engineering

4. For the purpose of this approval, the senior design staff are:

██████████ – Director of Engineering

██████████ – Chief Designer

██████████ – Deputy Chief Designer

██████████ – Chief Airworthiness Engineer

██████████ – Chief Structural Engineer

██████████ – Head of Avionics

██████████ – Head of Flight Dynamics

5. Certificates of Design, as required by MAA Regulatory Publications (MRP), DME 5000 Series (or Defence Standard (Def Stan) 05-123 where contract signature pre-dates the issue of the MRP) and which are to be submitted to the TL, will be certified by:

██████████ – Director of Engineering on behalf of the board of Marshalls of Cambridge Aerospace Limited, or by,

██████████ – Managing Director or by,

██████████ – Operations Director

and for design by:

██████████ – Chief Designer, or by,

██████████ – Director of Engineering, or by,

██████████ – Chief Airworthiness Engineer, or by

██████████ – Deputy Chief Engineer, or by,

██████████ – Deputy Chief Designer, or by,

██████████ – Chief Structural Engineer, or by,

██████████ – Head of Avionics, or by,

██████████ – Airworthiness & Structural Consultant

and for structural clearance¹ by:

- ██████████ – Chief Structural Engineer, or by,
- ██████████ – Airworthiness & Structural Consultant.

NOTE: The same signatory may not sign for both Board and Design on the same Certificate of Design.

6. Certificate for Flight Trials/Military Flight Test Permits (MFTP) will be certified by:

- ██████████ – Chief Airworthiness Engineer, or by,
- ██████████ – Director of Engineering, or by,
- ██████████ – Chief Designer, or by,
- ██████████ – Head of Flight Dynamics, or by,
- ██████████ – Airworthiness & Structural Consultant.

NOTE: The same signatory may not sign for both Certificates of Design and Certificates for Flight Trials/MFTP.

7. Flight Trials Reports will be certified by:

- ██████████ – Chief Airworthiness Engineer, or by
- ██████████ – Director of Engineering, or by,
- ██████████ – Chief Designer, or by,
- ██████████ – Chief Test Pilot, or by,
- ██████████ – Head of Flight Dynamics, or by,
- ██████████ – Airworthiness & Structural Consultant.

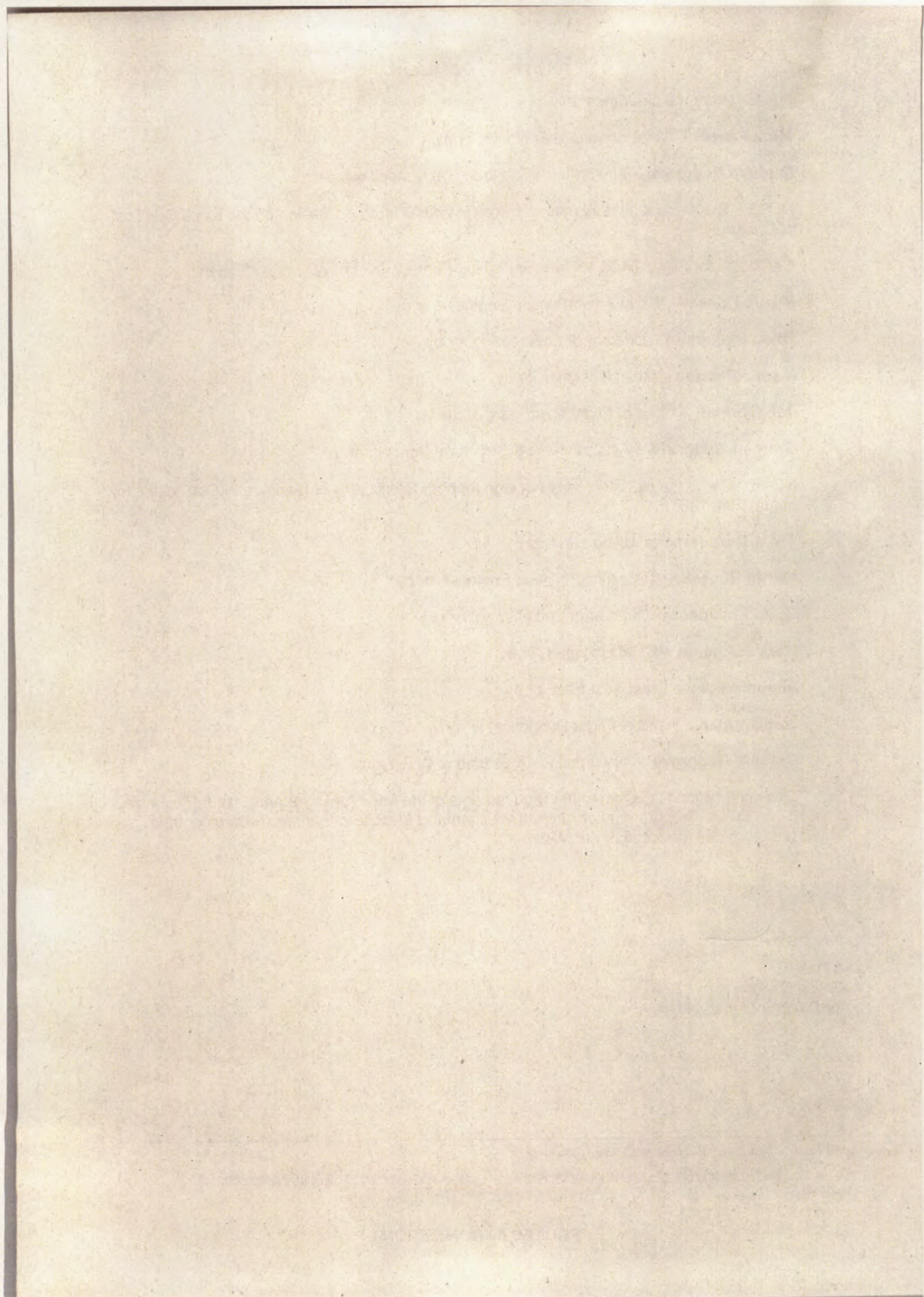
8. This certification is subject to the requirements of the MRP (or Def Stan 05-123² 'Technical Procedures for the Procurement of Aircraft, Weapon and Electronic Systems' where contract signature pre-dates the issue of the MRP).

████████████████████
████████████████████
████████████████████

Group Captain
for Director General MAA

¹ Of airborne electronic equipment, MOD Form 100A refers

² See <http://www.mod.uk/DefenceInternet/AboutDefence/corporatepublications/airsafetyandaviationpublications/maa/rl>





[REDACTED]
FRAeS RAF
Deputy Head of Oversight and Approvals 2
Military Aviation Authority
Juniper 1, Wing 4, #5104
MOD Abbey Wood (North)
Bristol BS34 8QW
Military Network: [REDACTED]
Telephone [REDACTED]
Email [REDACTED]
www.maa.mod.uk

Marshall of Cambridge Aerospace Limited,
The Airport,
Newmarket Road,
Cambridge,
CB5 8RX

Reference: UK.MAA.DAOS.153

Date: 10 October 2013

For the attention of: [REDACTED] - Certification Manager

Dear [REDACTED]

DESIGN APPROVAL CERTIFICATE FOR MILITARY AIRCRAFT AND AIRBORNE EQUIPMENT

References:

- A. ALTG/07/03/11/153 dated 03 September 2013.
- B. E-mail received from [REDACTED] dated 07/10/2013.

1. Find enclosed the revised design approval certificate for Marshall of Cambridge Aerospace Ltd. which recognises the privileges bounded by MAA Regulatory Publications (MRP) iaw paragraph 9 of the MOD Regulatory Articles (RA) 1000 Series 'Foreword' and the associated MOD contract(s). The certificate supersedes and replaces the certificate and schedule issued at Reference A, and reflects the details notified at Reference B. Note for contract revision or new contract(s), MRP DME 5000 Series replaces Defence Standard 05-123¹. There is a requirement to notify the MAA and the Project Team(s) named in the contract(s) of proposed change(s) of signatory or scope and to obtain the agreement of the Deputy Head of Approvals (undersigned) to any change.
2. If there are any changes to your staff, facilities, products, organizational structure or company name that will affect this certificate, please inform the MAA. Your attention is specifically drawn to the conditions contained in the certificate and to the requirements of the MRP RA 5101(1). If no changes have occurred after 3 years from issue or re-issue of DAOS certificate, the organization shall advise the MAA in writing that the details of the certificate are still correct. Failure to do so may render the approval invalid.
3. You are requested to acknowledge receipt of this letter and confirm that the old certificate has been archived.

¹ See <http://www.mod.uk/DefenceInternet/AboutDefence/corporatepublications/airsafetyandaviationpublications/maa/rf/>

~~PROTECT - COMMERCIAL~~

Enclosure:

1. Design Approval Certificate dated 10 October 2013

Distribution:

Information:

MA to Dir Air support
MA to Dir MAA Operations
Delivery manager AS AirSTAR
HTPT-PTL

DES AS-Dir MA
MAA-Op-D MA
DES AS-AirSTAR Delivery Manager
DES HTPT-PTL

~~PROTECT - COMMERCIAL~~



[REDACTED] BSc MA MBA CEng
FRAeS RAF
Deputy Head of Oversight and Approvals 2
Military Aviation Authority
Juniper 1, Wing 4, #5104
MOD Abbey Wood (North)
Bristol BS34 8QW
Military Network: [REDACTED]
Telephone: [REDACTED]
Email: [REDACTED]@mod.uk
www.maa.mod.uk

Marshall of Cambridge Aerospace Limited,
The Airport,
Newmarket Road,
Cambridge,
CB5 8RX

Reference: UK.MAA.DAOS.153

Date: 21 November 2013

For the attention of: [REDACTED] - Certification Manager

D. [REDACTED]

DESIGN APPROVAL CERTIFICATE FOR MILITARY AIRCRAFT AND AIRBORNE EQUIPMENT

References:

- A. UK.MAA.DAOS.153 dated 10 October 2013.
- B. E-mail received from [REDACTED] with Form-82 attached dated 18/11/2013.

1. Find enclosed the revised design approval certificate for Marshall of Cambridge Aerospace Ltd. which recognises the privileges bounded by MAA Regulatory Publications (MRP) iaw paragraph 9 of the MOD Regulatory Articles (RA) 1000 Series 'Foreword' and the associated MOD contract(s). The certificate supersedes and replaces the certificate and schedule issued at Reference A, and reflects the details notified at Reference B. Note for contract revision or new contract(s), MRP DME 5000 Series replaces Defence Standard 05-123¹. There is a requirement to notify the MAA and the Project Team(s) named in the contract(s) of proposed change(s) of signatory or scope and to obtain the agreement of the Deputy Head of Approvals (undersigned) to any change.

1. If there are any changes to your staff, facilities, products, organizational structure or company name that will affect this certification, these should be passed to the MAA. Your attention is specifically drawn to the conditions contained in the certificate and to the requirements of the MRP RA 5101(1). If no changes have occurred, then 6 months prior to the expiry of the DAOS approval, the Organization shall advise the MAA in writing that the details of the approval are still correct. Failure to do so may render the approval invalid.

2. You are requested to acknowledge receipt of this letter and confirm that the old certificate has been archived.

[Signature]
[REDACTED]

¹ See <http://www.mod.uk/DefenceInternet/AboutDefence/corporatepublications/airsafetyandaviationpublications/maa/rf/>

~~PROTECT—COMMERCIAL~~

Enclosure:

1. Design Approval Certificate dated 21 November 2013

Distribution:

Information:

MA to Dir Air support
MA to Dir MAA Operations
Delivery manager AS AirSTAR
HTPT-PTL

DES AS-Dir MA
MAA-Tech-D MA
DES AS-AirSTAR Delivery Manager
DES HTPT-PTL

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Deputy Head of Oversight and Approvals 2
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Telephone: [REDACTED]
Email: [REDACTED]@mod.uk
www.maa.mod.uk

Marshall of Cambridge Aerospace Limited,
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Newmarket Road,
Cambridge,
CB5 8RX

Reference: UK.MAA.DAOS.153

Date of Issue: 21 November 2013
Date of Expiry: 02 September 2016

DESIGN APPROVAL CERTIFICATE FOR MILITARY AIRCRAFT AND AIRBORNE EQUIPMENT

1. This certificate recognises the organization's capability for the design, development and certification of the following products and services under contract with the Ministry of Defence (MOD):
 - a. Modifications and special installations in Fixed Wing Aircraft.
 - b. Modifications and special installations in Viking Glider Aircraft.
 - c. Modifications and special installations in Helicopters.
 - d. Special test and support equipment for items a, b and c.
 - e. Flight testing. Authorised flight testing is limited to: Quantitative assessment of aircraft performance and Avionic and Engineering systems on Fixed Wing Aircraft.
2. The following conditions apply to this certificate:
 - a. Where the aircraft structure is affected, or where there is installation, integration or modification of equipment or aircraft systems, any limitations prescribed by the Aircraft Design Organization for structure, aerodynamics, weight, centre of gravity, and systems (including software) must be respected. Designs shall not transgress such limitations without the written technical agreement of the Aircraft Design Organization, and/or the MOD Project Team Leader (TL) for the aircraft concerned.
 - b. The Aircraft Design Organization shall be consulted if the installation or modification affects primary structure, primary controls, primary instruments or displays, or the external shape of the aircraft, including stores.
 - c. Where relevant design documentation cannot be obtained from the Aircraft Design Organization/OEM or where consultation is considered not to be required, then any potential impact on Safety or Airworthiness shall be assessed and fully documented. This responsibility will rest with the recognised design signatories. The TL for the aircraft concerned shall be informed in all such cases.
 - d. All changes to the aircraft build standard shall be forwarded to the Aircraft Design Organization for configuration management purposes.

3. Overall responsibility for the Design Organization rests with:

██████████ – Chief Executive Officer.

And for flight test operations in the Accountable Manager (Military Flying) role,

██████████ – Chief Executive Officer.

4. For the purpose of this approval, the senior design staff are:

██████████ – Director of Engineering.

██████████ – Deputy Chief Engineer.

██████████ – Deputy Chief Designer.

██████████ – Chief Airworthiness Engineer.

██████████ – Head of Avionics.

██████████ – Chief Structural Engineer.

██████████ – Head of Flight Dynamics

5. Certificates of Design, as required by MAA Regulatory Publications (MRP), DME 5000 Series (or Defence Standard (Def Stan) 05-123 where contract signature pre-dates the issue of the MRP) and which are to be submitted to the TL, will be certified by:

██████████ – Director of Engineering on behalf of the board of Marshall of Cambridge Aerospace Limited, or by,

██████████ – Chief Executive Officer or by,

██████████ – Director of Engineering Solutions or by,

██████████ – Operations Director.

and for design by:

██████████ – Chief Designer, or by,

██████████ – Chief Airworthiness Engineer, or by

██████████ – Deputy Chief Engineer, or by,

██████████ – Deputy Chief Designer, or by,

██████████ – Chief Structural Engineer, or by,

██████████ – Head of Avionics, or by,

██████████ – Airworthiness & Structural Consultant.



Deputy Head of Oversight and Approvals 2

Military Aviation Authority

Juniper 1, Wing 4, #5104

MOD Abbey Wood (North)

Bristol BS34 8QW

Military Network: [REDACTED]

Telephone: [REDACTED]

Email: [REDACTED]

www.maa.mod.uk

Marshall of Cambridge Aerospace Limited,
The Airport,
Newmarket Road,
Cambridge,
CB5 8RX

Reference: UK.MAA.DAOS.153

Date of Issue: 14 August 2014

Date of Expiry: 02 September 2016

DESIGN APPROVAL CERTIFICATE FOR MILITARY AIRCRAFT AND AIRBORNE EQUIPMENT

1. This certificate recognises the organization's capability for the design, development and certification of the following products and services under contract with the Ministry of Defence (MOD):

- a. Modifications, Repairs and Post Design Services of Fixed Wing Aircraft.
- b. Modifications, Repairs and Post Design Services of Viking Glider Aircraft.
- c. Modifications, Repairs and Post Design Services of Helicopters.
- d. Special test and support equipment for items a, b and c.
- e. Flight testing. Authorised flight testing is limited to: Quantitative assessment of aircraft performance and Avionic and Engineering systems on Fixed Wing Aircraft.

2. The following conditions apply to this certificate:

- a. Where the aircraft structure is affected, or where there is installation, integration or modification of equipment or aircraft systems, any limitations prescribed by the Aircraft Design Organization for structure, aerodynamics, weight, centre of gravity, and systems (including software) must be respected. Designs shall not transgress such limitations without the written technical agreement of the Aircraft Design Organization, and/or the MOD Project Team Leader (TL) for the aircraft concerned.
- b. The Aircraft Design Organization shall be consulted if the installation or modification affects primary structure, primary controls, primary instruments or displays, or the external shape of the aircraft, including stores.
- c. Where relevant design documentation cannot be obtained from the Aircraft Design Organization/OEM or where consultation is considered not to be required, then any potential impact on Safety or Airworthiness shall be assessed and fully documented. This responsibility will rest with the recognised design signatories. The TL for the aircraft concerned shall be informed in all such cases.
- d. All changes to the aircraft build standard shall be forwarded to the Aircraft Design Organization for configuration management purposes.

MAA DAOS Form-81a

3. Overall responsibility for the Design Organization rests with:

██████████ – Chief Executive Officer.

And for flight test operations in the Accountable Manager (Military Flying) role,

██████████ – Chief Executive Officer.

4. For the purpose of this approval, the senior design staff are:

██████████ – Director of Engineering.

██████████ – Deputy Chief Engineer.

██████████ – Chief Airworthiness Engineer.

██████████ – Head of Avionics.

██████████ – Chief Structural Engineer.

██████████ – Head of Flight Dynamics

5. Certificates of Design, as required by MAA Regulatory Publications (MRP), DME 5000 Series (or Defence Standard (Def Stan) 05-123 where contract signature pre-dates the issue of the MRP) and which are to be submitted to the TL, will be certified by:

██████████ – Director of Engineering on behalf of the board of Marshall of Cambridge Aerospace Limited, or by,

██████████ – Chief Executive Officer or by,

██████████ – Director of Engineering Solutions or by,

██████████ – Operations Director.

and for design by:

██████████ – Director of Engineering, or by,

██████████ – Chief Airworthiness Engineer, or by

██████████ – Deputy Chief Engineer, or by,

██████████ – Chief Structural Engineer, or by,

██████████ – Head of Avionics, or by,

██████████ – Airworthiness & Structural Consultant.

and for structural clearance¹ by:

██████████ – Chief Structural Engineer, or by,

██████████ – Airworthiness & Structural Consultant.

¹ Of airborne electronic equipment, MOD Form 100A refers

NOTE: The same signatory may not sign for both Board and Design on the same Certificate of Design.

6. Certificate for Flight Trials/Military Flight Test Permits (MFTP) will be certified by:

██████████ – Chief Airworthiness Engineer, or by,

██████████ – Director of Engineering, or by,

██████████ – Head of Flight Dynamics, or by,

██████████ – Airworthiness & Structural Consultant.

NOTE: The same signatory may not sign for both Certificates of Design and Certificates for Flight Trials/MFTP.

7. Flight Trials Reports will be certified by:

██████████ – Chief Airworthiness Engineer, or by

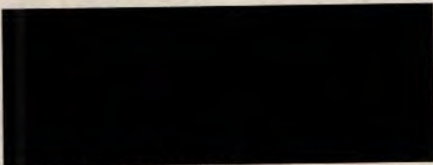
██████████ – Director of Engineering, or by,

██████████ – Chief Test Pilot, or by,

██████████ – Head of Flight Dynamics, or by,

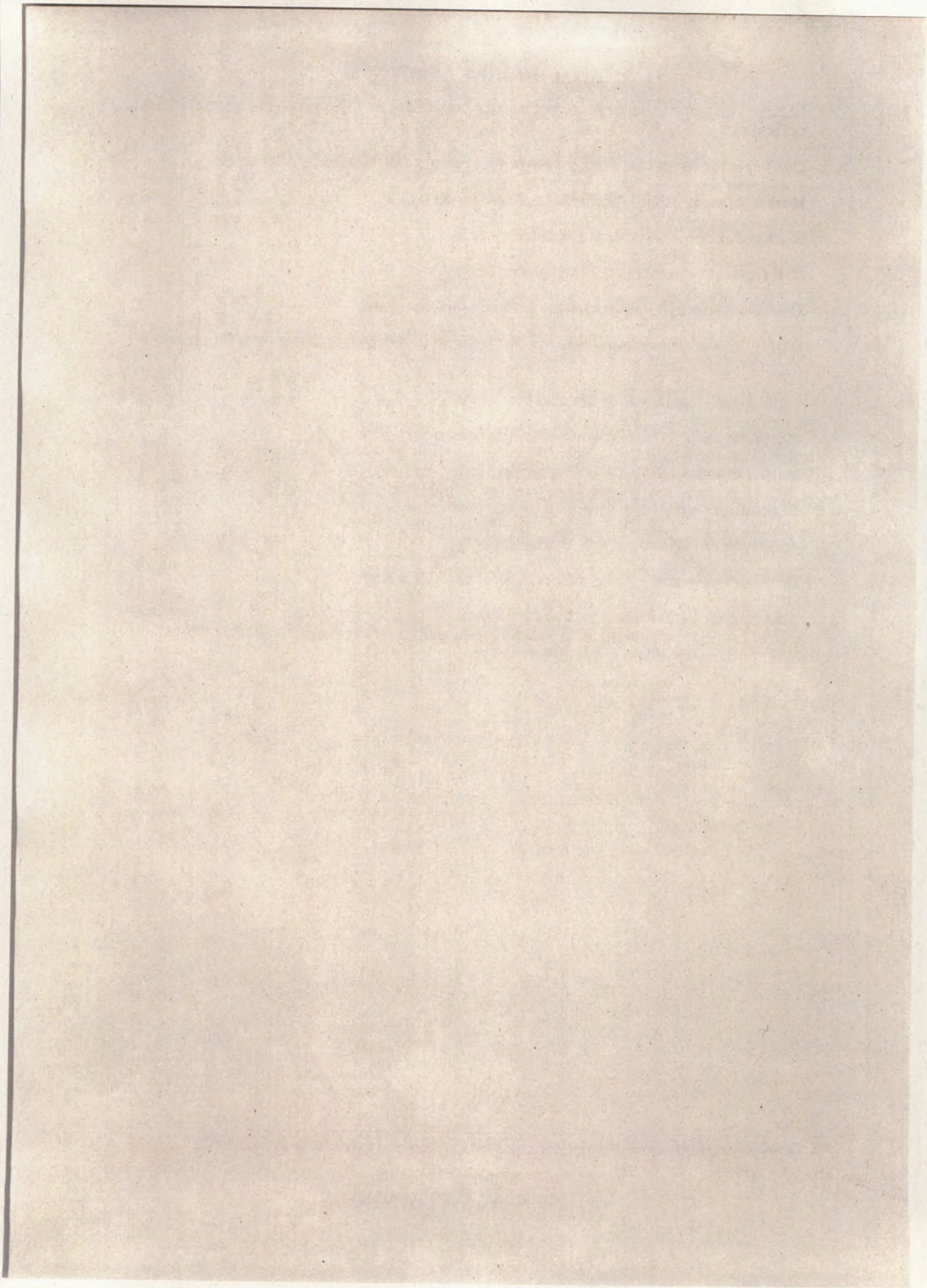
██████████ – Airworthiness & Structural Consultant.

8. This certification is subject to the requirements of the MRP (or Def Stan 05-123² 'Technical Procedures for the Procurement of Aircraft, Weapon and Electronic Systems' where contract signature pre-dates the issue of the MRP).



Group Captain
for Director General MAA

² See <http://www.mod.uk/DefenceInternet/AboutDefence/corporatepublications/airsafetyandaviationpublications/maa/rfl>





[REDACTED] BSc MA MBA CEng

FRAeS RAF
Deputy Head of Oversight and Approvals 2
Military Aviation Authority
Juniper 1, Wing 4, #5104
MOD Abbey Wood (North)
Bristol BS34 8QW
Military Network: [REDACTED]
Telephone: [REDACTED]
Email: [REDACTED]@mod.uk
www.maa.mod.uk

Marshall of Cambridge Aerospace Limited,
The Airport,
Newmarket Road,
Cambridge,
CB5 8RX

Reference: UK.MAA.DAOS.153

Date: 14 August 2014

For the attention of: [REDACTED] – Certification Manager

Dear [REDACTED]

DESIGN APPROVAL CERTIFICATE FOR MILITARY AIRCRAFT AND AIRBORNE EQUIPMENT

References:

- A. UK.MAA.DAOS.153 dated 21 November 2013.
- B. Form-82 received from [REDACTED] dated 30 July 2014.

1. Find enclosed the revised design approval certificate for Marshall of Cambridge Aerospace Ltd. which recognises the privileges bounded by MAA Regulatory Publications (MRP) iaw paragraph 9 of the MOD Regulatory Articles (RA) 1000 Series 'Foreword' and the associated MOD contract(s). The certificate supersedes and replaces the certificate and schedule issued at Reference A, and reflects the details notified at Reference B. Note for contract revision or new contract(s), MRP DME 5000 Series replaces Defence Standard 05-123¹. There is a requirement to notify the MAA and the Project Team(s) named in the contract(s) of proposed change(s) of signatory or scope and to obtain the agreement of the Deputy Head of Approvals (undersigned) to any change.

2. If there are any changes to your staff, facilities, products, organizational structure or company name that will affect this certification, these should be passed to the MAA. Your attention is specifically drawn to the conditions contained in the certificate and to the requirements of the MRP RA 5101(1). If no changes have occurred, then 6 months prior to the expiry of the DAOS approval, the Organization shall advise the MAA in writing that the details of the approval are still correct. Failure to do so may render the approval invalid.

3. You are requested to acknowledge receipt of this letter and confirm that the old certificate has been archived.

Yours faithfully
[REDACTED]

¹ See <http://www.mod.uk/DefenceInternet/AboutDefence/corporatepublications/airsafetyandaviationpublications/maa/rf>

~~OFFICIAL SENSITIVE COMMERCIAL~~

Enclosure:

1. Design Approval Certificate dated 14 August 2014

Distribution:

Information:

MA to Dir Air support
MA to Dir MAA Operations
Delivery manager AS AirSTAR
HTPT-PTL

DES AS-Dir MA
MAA-Tech-D MA
DES AS-AirSTAR Delivery Manager
DES HTPT-PTL

~~OFFICIAL SENSITIVE COMMERCIAL~~

NOTE: The same signatory may not sign for both Board and Design on the same Certificate of Design.

6. Certificate for Flight Trials/Military Flight Test Permits (MFTP) will be certified by:

- ██████████ – Chief Airworthiness Engineer, or by,
- ██████████ – Director of Engineering, or by,
- ██████████ – Head of Flight Dynamics, or by,
- ██████████ – Airworthiness & Structural Consultant.

NOTE: The same signatory may not sign for both Certificates of Design and Certificates for Flight Trials/MFTP.

7. Flight Trials Reports will be certified by:

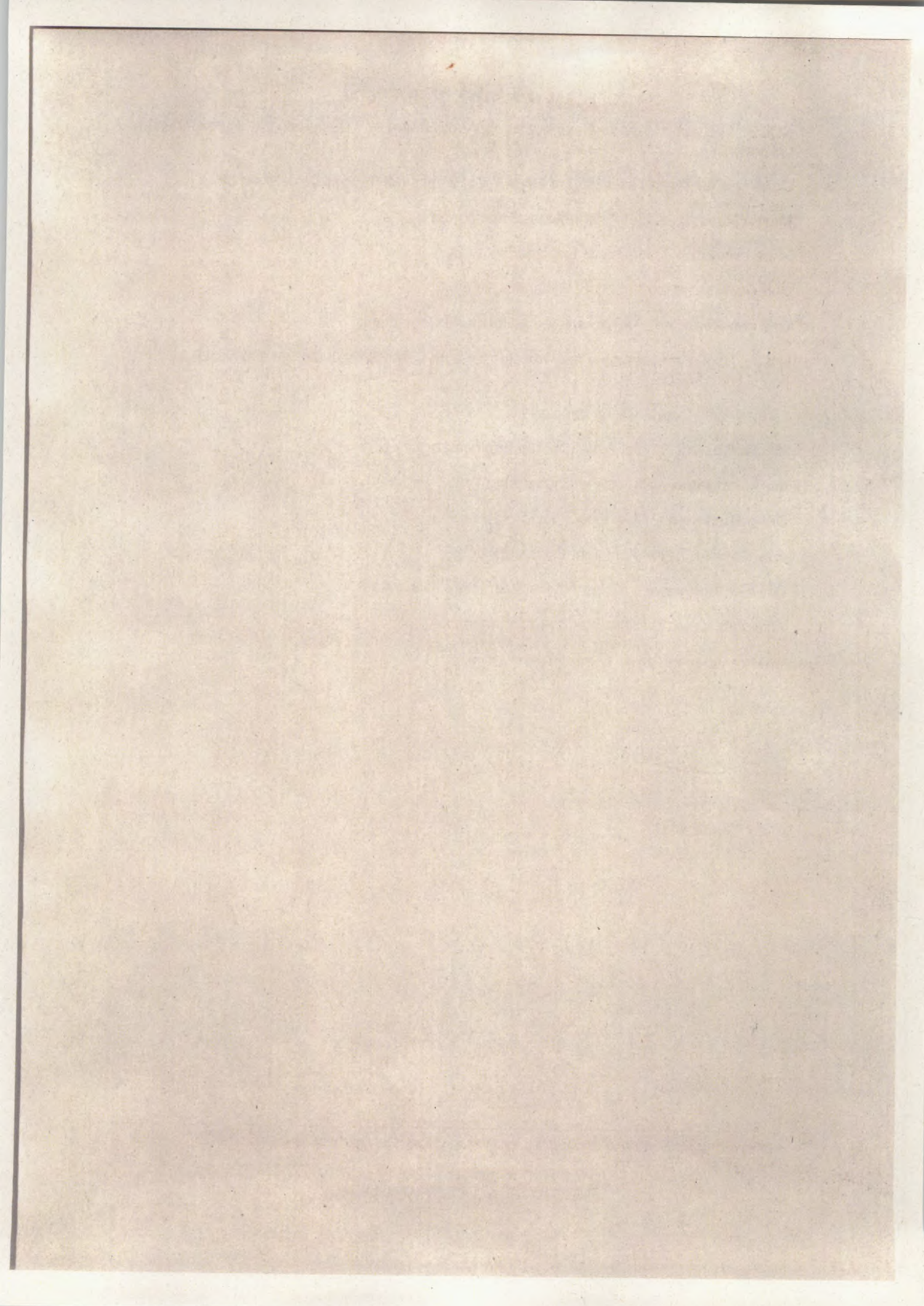
- ██████████ – Chief Airworthiness Engineer, or by
- ██████████ – Director of Engineering, or by,
- ██████████ – Chief Test Pilot, or by,
- ██████████ – Head of Flight Dynamics, or by,
- ██████████ – Airworthiness & Structural Consultant.

8. This certification is subject to the requirements of the MRP (or Def Stan 05-123² 'Technical Procedures for the Procurement of Aircraft, Weapon and Electronic Systems' where contract signature pre-dates the issue of the MRP).



for Director General MAA

² See <http://www.mod.uk/DefenceInternet/AboutDefence/corporatepublications/airsafetyandaviationpublications/maa/rfl>





[REDACTED] BSc MA MBA CEng
FRAeS RAF
Deputy Head of Oversight and Approvals 2
Military Aviation Authority
Juniper 1, Wing 4, #5104
MOD Abbey Wood (North)
Bristol BS34 8QW
Military Network: [REDACTED]
Telephone: [REDACTED]
Email: [REDACTED]@mod.uk
www.maa.mod.uk

Marshall of Cambridge Aerospace Limited,
The Airport,
Newmarket Road,
Cambridge,
CB5 8RX

Reference: UK.MAA.DAOS.153

Date: 14 August 2014

For the attention of: [REDACTED] – Certification Manager

Dor [REDACTED]

DESIGN APPROVAL CERTIFICATE FOR MILITARY AIRCRAFT AND AIRBORNE EQUIPMENT

References:

- A. UK.MAA.DAOS.153 dated 21 November 2013.
- B. Form-82 received from [REDACTED] dated 30 July 2014.

1. Find enclosed the revised design approval certificate for Marshall of Cambridge Aerospace Ltd. which recognises the privileges bounded by MAA Regulatory Publications (MRP) iaw paragraph 9 of the MOD Regulatory Articles (RA) 1000 Series 'Foreword' and the associated MOD contract(s). The certificate supersedes and replaces the certificate and schedule issued at Reference A, and reflects the details notified at Reference B. Note for contract revision or new contract(s), MRP DME 5000 Series replaces Defence Standard 05-123¹. There is a requirement to notify the MAA and the Project Team(s) named in the contract(s) of proposed change(s) of signatory or scope and to obtain the agreement of the Deputy Head of Approvals (undersigned) to any change.

2. If there are any changes to your staff, facilities, products, organizational structure or company name that will affect this certification, these should be passed to the MAA. Your attention is specifically drawn to the conditions contained in the certificate and to the requirements of the MRP RA 5101(1). If no changes have occurred, then 6 months prior to the expiry of the DAOS approval, the Organization shall advise the MAA in writing that the details of the approval are still correct. Failure to do so may render the approval invalid.

3. You are requested to acknowledge receipt of this letter and confirm that the old certificate has been archived.

Tom
[REDACTED]

¹ See <http://www.mod.uk/DefenceInternet/AboutDefence/corporatepublications/airsafetyandaviationpublications/maa/rf/>

~~OFFICIAL SENSITIVE COMMERCIAL~~

Enclosure:

1. Design Approval Certificate dated 14 August 2014

Distribution:

Information:

MA to Dir Air support
MA to Dir MAA Operations
Delivery manager AS AirSTAR
HTPT-PTL

DES AS-Dir MA
MAA-Tech-D MA
DES AS-AirSTAR Delivery Manager
DES HTPT-PTL

~~OFFICIAL SENSITIVE COMMERCIAL~~



Deputy Head of Oversight and
Approvals 2

Military Aviation Authority

Juniper 1, Wing 4, #5104

MOD Abbey Wood (North)

Bristol BS34 8QW

Military Network: [REDACTED]

Telephone: [REDACTED]

Email: [REDACTED]@mod.uk

www.maa.mod.uk

Marshall of Cambridge Aerospace Limited,
The Airport,
Newmarket Road,
Cambridge,
CB5 8RX

Reference: UK.MAA.DAOS.153

Date of Issue: 14 August 2014

Date of Expiry: 02 September 2016

DESIGN APPROVAL CERTIFICATE FOR MILITARY AIRCRAFT AND AIRBORNE EQUIPMENT

1. This certificate recognises the organization's capability for the design, development and certification of the following products and services under contract with the Ministry of Defence (MOD):

- a. Modifications, Repairs and Post Design Services of Fixed Wing Aircraft.
- b. Modifications, Repairs and Post Design Services of Viking Glider Aircraft.
- c. Modifications, Repairs and Post Design Services of Helicopters.
- d. Special test and support equipment for items a, b and c.
- e. Flight testing. Authorised flight testing is limited to: Quantitative assessment of aircraft performance and Avionic and Engineering systems on Fixed Wing Aircraft.

2. The following conditions apply to this certificate:

- a. Where the aircraft structure is affected, or where there is installation, integration or modification of equipment or aircraft systems, any limitations prescribed by the Aircraft Design Organization for structure, aerodynamics, weight, centre of gravity, and systems (including software) must be respected. Designs shall not transgress such limitations without the written technical agreement of the Aircraft Design Organization, and/or the MOD Project Team Leader (TL) for the aircraft concerned.
- b. The Aircraft Design Organization shall be consulted if the installation or modification affects primary structure, primary controls, primary instruments or displays, or the external shape of the aircraft, including stores.
- c. Where relevant design documentation cannot be obtained from the Aircraft Design Organization/OEM or where consultation is considered not to be required, then any potential impact on Safety or Airworthiness shall be assessed and fully documented. This responsibility will rest with the recognised design signatories. The TL for the aircraft concerned shall be informed in all such cases.
- d. All changes to the aircraft build standard shall be forwarded to the Aircraft Design Organization for configuration management purposes.

MAA DAOS Form-81a

3. Overall responsibility for the Design Organization rests with:

██████████ – Chief Executive Officer.

And for flight test operations in the Accountable Manager (Military Flying) role,

██████████ – Chief Executive Officer.

4. For the purpose of this approval, the senior design staff are:

██████████ – Director of Engineering.

██████████ – Deputy Chief Engineer.

██████████ – Chief Airworthiness Engineer.

██████████ – Head of Avionics.

██████████ – Chief Structural Engineer.

██████████ – Head of Flight Dynamics

5. Certificates of Design, as required by MAA Regulatory Publications (MRP), DME 5000 Series (or Defence Standard (Def Stan) 05-123 where contract signature pre-dates the issue of the MRP) and which are to be submitted to the TL, will be certified by:

██████████ – Director of Engineering on behalf of the board of Marshall of Cambridge Aerospace Limited, or by,

██████████ – Chief Executive Officer or by,

██████████ – Director of Engineering Solutions or by,

██████████ – Operations Director.

and for design by:

██████████ – Director of Engineering, or by,

██████████ – Chief Airworthiness Engineer, or by

██████████ – Deputy Chief Engineer, or by,

██████████ – Chief Structural Engineer, or by,

██████████ – Head of Avionics, or by,

██████████ – Airworthiness & Structural Consultant.

and for structural clearance¹ by:

██████████ – Chief Structural Engineer, or by,

██████████ – Airworthiness & Structural Consultant.

¹ Of airborne electronic equipment, MOD Form 100A refers



Military Aviation Authority

APPROVAL CERTIFICATE

Reference UK.MAA.DAOS.0153 Revision 1

The Military Aviation Authority hereby certifies:

Marshall of Cambridge Aerospace Ltd

The Airport
Cambridge
CB5 8RX

as a DME RA5101 Design Organization, approved to design products
as listed in the current MAA issued approval schedule.

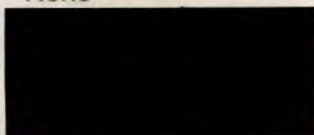
CONDITIONS

1. This approval is limited to that specified in the attached schedule, and
2. Requires compliance with the procedures specified in the referenced Design Organization Exposition, and
3. Is valid whilst the approved Design Organization remains in compliance with the MRP.
4. Subject to compliance with foregoing conditions, this approval shall remain valid until the approval is surrendered, superseded, revoked or Expires.

Initial issue Date 13 October 1987 Date of Revision: 28 March 2017

Expiry Date None

Signature:



Name:

Post: Oversight & Approvals Deputy Head 2

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DAOS APPROVAL SCHEDULE

Organisation: Marshall of Cambridge

Reference: UK.MAA.DAOS.0153 Revision 1

CLASS	TYPE	DESIGN LIMITATIONS
AIRCRAFT		
Aeroplanes	Platform	Development of fixed wing aircraft
Helicopters	Platform	Development of rotary wing aircraft
Other Aircraft	Platform	Development of Viking Glider aircraft and PDS activity for Dakota aircraft

PRIVILEGES

The following are valid only when invoked in contract by the relevant MOD TAA

RA5850 (10) Privilege	Design Limitations	
Classify	Modifications & Repair	Hercules C-130J
Approve	Modifications & Repair	Hercules C-130J, Minor only

This approval schedule is limited to those products and activities specified in the scope of the approval section contained in approved DME 5000 design organisation exposition.

Exposition reference: 00-01-E0002

Approved Signatories

ROLE	NAME	POST	LIMITATIONS
Board	██████████	Director of Engineering	None
Board	██████████	Chief Executive Officer	None
Board	██████████	Infrastructure & Compliance Director	None
Design	██████████	Director of Engineering	None
Design	██████████	Chief Airworthiness Engineer	None
Design	██████████	Chief Designer	None
Design	██████████	Chief Structural Engineer	None
Design	██████████	Deputy Chief Designer	None

~~Handling Instructions: Commercial in Confidence~~

Electronic Structural Clearance	██████████	Chief Structural Engineer	None
Military Flight Test Permit	██████████	Chief Airworthiness Engineer	None
Military Flight Test Permit	██████████	Director of Engineering	None
Military Flight Test Permit	██████████	Head of Flight Dynamics	None
Flight Trials Reports	██████████	Chief Airworthiness Engineer	None
Flight Trials Reports	██████████	Director of Engineering	None
Flight Trials Reports	██████████	Chief Test Pilot	None
Flight Trials Reports	██████████	Head of Flight Dynamics	None

Signature:	██████████	Date of Issue:	28 March 2017
Name:	██████████	Post:	Oversight & Approvals Deputy Head 2



Military Aviation Authority

APPROVAL CERTIFICATE

Reference UK.MAA.DAOS.0153 Revision 2

The Military Aviation Authority hereby certifies:

Marshall of Cambridge Aerospace Ltd

The Airport
Cambridge
CB5 8RX

as a DME RA5101 Design Organization, approved to design products
as listed in the current MAA issued approval schedule.

CONDITIONS

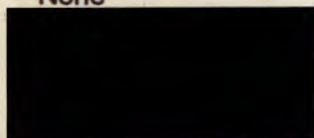
1. This approval is limited to that specified in the attached schedule, and
2. Requires compliance with the procedures specified in the referenced Design Organization Exposition, and
3. Is valid whilst the approved Design Organization remains in compliance with the MRP.
4. Subject to compliance with foregoing conditions, this approval shall remain valid until the approval is surrendered, superseded, revoked or Expires.

Initial issue Date 13 October 1987

Date of Revision: 3 May 2017

Expiry Date None

Signature:



Name:

Post: Oversight Approvals, DAOS Branch Head

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DAOS APPROVAL SCHEDULE

Organisation: Marshall of Cambridge Aerospace Ltd

Reference: UK.MAA.DAOS.0153 Revision 2

CLASS	TYPE	DESIGN LIMITATIONS
AIRCRAFT		
Aeroplanes	Platform	Development of fixed wing aircraft
Helicopters	Platform	Development of rotary wing aircraft
Other Aircraft	Platform	Development of Viking Glider aircraft and PDS activity for Dakota aircraft

PRIVILEGES

The following are valid only when invoked in contract by the relevant MOD TAA

RA5850 (10) Privilege	Design Limitations	
Classify	Modifications & Repair	Hercules C-130J
Approve	Modifications & Repair	Hercules C-130J, Minor only

This approval schedule is limited to those products and activities specified in the scope of the approval section contained in approved DME 5000 design organisation exposition.

Exposition reference: 00-01-E0002

Approved Signatories

ROLE	NAME	POST	LIMITATIONS
Board	██████████	Director of Engineering	None
Board	██████████	Chief Executive Officer	None
Board	██████████	Infrastructure & Compliance Director	None
Design	██████████	Director of Engineering	None
Design	██████████	Chief Airworthiness Engineer	None
Design	██████████	Chief Designer	None
Design	██████████	Chief Structural Engineer	None
Design	██████████	Deputy Chief Designer	None

~~Handling Instructions: Commercial in Confidence~~

Electronic Structural Clearance	████████	Chief Structural Engineer	None
Military Flight Test Permit	████████	Chief Airworthiness Engineer	None
Military Flight Test Permit	████████	Director of Engineering	None
Military Flight Test Permit	████████	Head of Flight Dynamics	None
Flight Trials Reports	████████	Chief Airworthiness Engineer	None
Flight Trials Reports	████████	Director of Engineering	None
Flight Trials Reports	████████	Chief Test Pilot	None
Flight Trials Reports	████████	Head of Flight Dynamics	None

Signature:	████████	Date of Issue:	3 May 2017
Name:	████████	Post:	Oversight & Approvals, DAOS Branch Head