



ECAS

Electronic Continuing Airworthiness System

(User Preview)

Disclaimer: This document is not intended to be used as a user manual for ECAS, but as a Preview of the systems capabilities. It outlines the basic functions of ECAS and demonstrates how the user interacts with the system.

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Abstract

In 2005 a new regional airline was established in Greece. Sky Express S.A. started operating niche point to point routes between the Greek islands on 18/30 seater Jetstream 31/41 aircraft.

The maintenance of the particular aircraft could be easily planned on an excel sheet, however, when the airline went onto larger MSG3 aeroplanes, B747 (cargo) in 2006 and MD-80s in 2008, then the need for a proper maintenance planning tool became imperative.

The available software at the time seemed either too trivial (excel look-alike or MS Access) or too complicated and too expensive for what they were doing. The complicated ones were developed by programmers that did not have a clue about the real needs of an aircraft maintenance environment and the simple ones were made by engineers that did not have a clue about programming.

We therefore decided to start building our own software in order to accommodate the new MSG3 aircraft additions into Sky Express' AOC. The specific task was undertaken by a team of aircraft and software engineers, who started building a Modular Programme based on C++ (sub)routines and the real needs of today's airworthiness and maintenance regulatory coexistence.

Following thousands of lines of C++ code and thousands of hours of brainstorming, meetings between the software and aircraft engineers, experimentation and trials of beta versions, we finally arrived at an Integrated Maintenance System, ECAS, which was undoubtedly both a powerful state of the art software and an engineering tool that did exactly what an airworthiness and maintenance environment needed.

ECAS continued to be improved with our next airline project, Minoan Air S.A., a Fokker 50 operator, where new additions were developed, such as a full store control capabilities including generation of Purchase Orders.

Although ECAS for the last 11 years was utilised internally only, the experts that have spent so much time and effort in developing the software, have now decided to start promoting it to other operators as well.

The programmer in charge of the software architecture and the actual coding has the copyright of the software through Cursata ltd. (www.cursata.com) and the authorised distributor is MAV Systems Ltd. (www.modularaviation.com).

Introduction

ECAS is an Item Related system, meaning that each item on each aircraft, even in stores, is treated individually with its own identity, its own history and its own log and tracking system. It is therefore the item or component that is being under surveillance and not the task (note that the airframe is an item by itself with a part number and a serial number).

In this way it is ensured that no matter where the component goes i.e. is installed from one aircraft to another or from one position to another on the same aircraft or spends time in the stores, the system keeps track of the component and therefore ensures that all tasks related to the component will be performed at the correct hours/cycles/time.

The system is initially loaded by the Continuing Airworthiness Management Organisation with all necessary information, the Operators' Maintenance Programme, all maintenance records of the aircraft and its inventory are entered in the system. After initial loading, in order for the system to perform as designed, it is necessary to be correctly updated by the CAMO and the Part 145 AMO.

The main driver for the system is the Work Orders. Nothing should be performed on an aircraft or component unless a Work Order is raised. The Work Order contains all the necessary information for the system to perform correctly. The Work Orders themselves are driven by the insertion of the Aircraft Technical Log Sheets in the system, i.e. hours and cycles update.

As the ATLS are entered daily, the Work Orders will be raised well before their time and the Maintenance Forecasts will be projected in real time. The system creates automatic Maintenance Forecasts which are continuously updated in accordance with the average last month utilisation of the aircraft. The utilisation averaging can be changed by the user, which enables to perform macro and micro-planning of the maintenance.

In order to achieve the required functionality of the system, every time a new aircraft type is introduced in the operators' AOC or the type Maintenance Programme is revised, the CAMO planner must appropriately update the system.

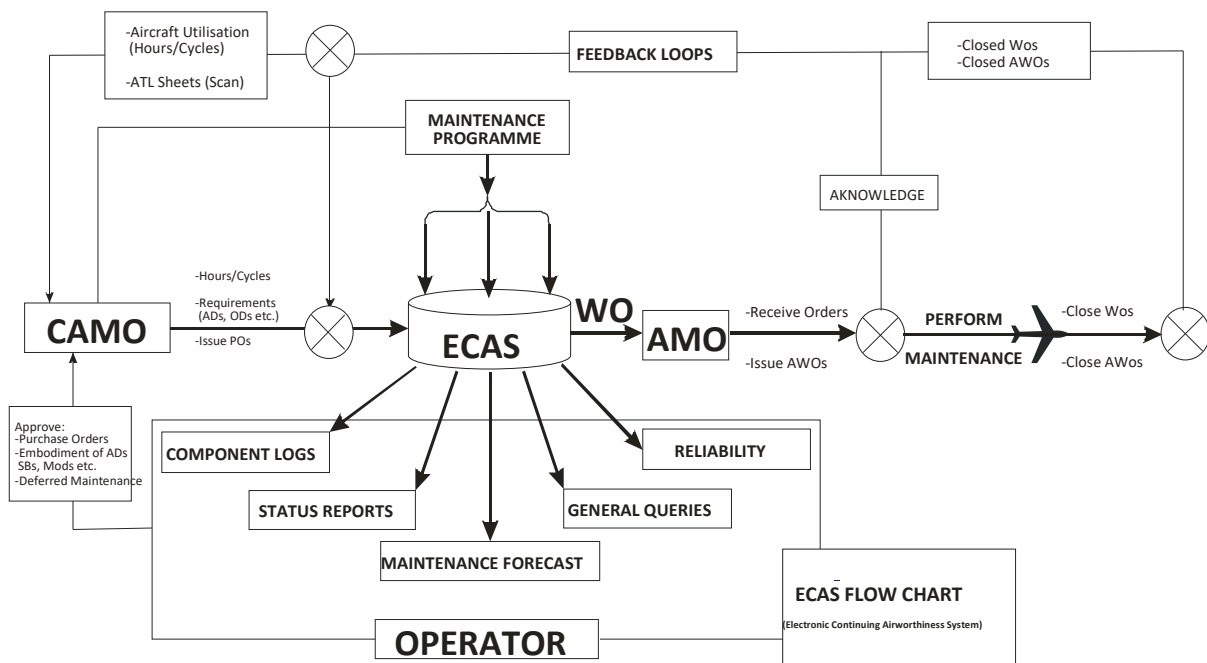
This is done by the following procedures:

- All hard time components are entered into the system stating part number, serial number and physical position.
- One ABLWO (Audit Background Life Work Order) is raised for each component in order to establish its life relative to the first flight performed in the operator's fleet. For example if the component was overhauled 1000 flight hours before its first flight with the operator, then it's background life in relation to ATL0001 is -1000 F.H. The ABLWOs are always based on the component's Release Documentation (e.g. EASA Form One).

- Each component (including the airframe) is related to the applicable tasks in accordance with the approved Operator’s Maintenance programme. The frequency of the tasks (in cycles, hours or days) is fed into the system.
- One ALCWO (Audit Last Carried-Out Work Order) is raised for each component-task pair in order to establish when the particular task was carried out.

When the above are complete, ECAS is ready to safely forecast all schedule maintenance provided it is correctly fed with the daily ATL hours and cycles.

The diagram below outlines the relationship between Continuing Airworthiness Management Organisation, Operator and Approved Maintenance Organisation:



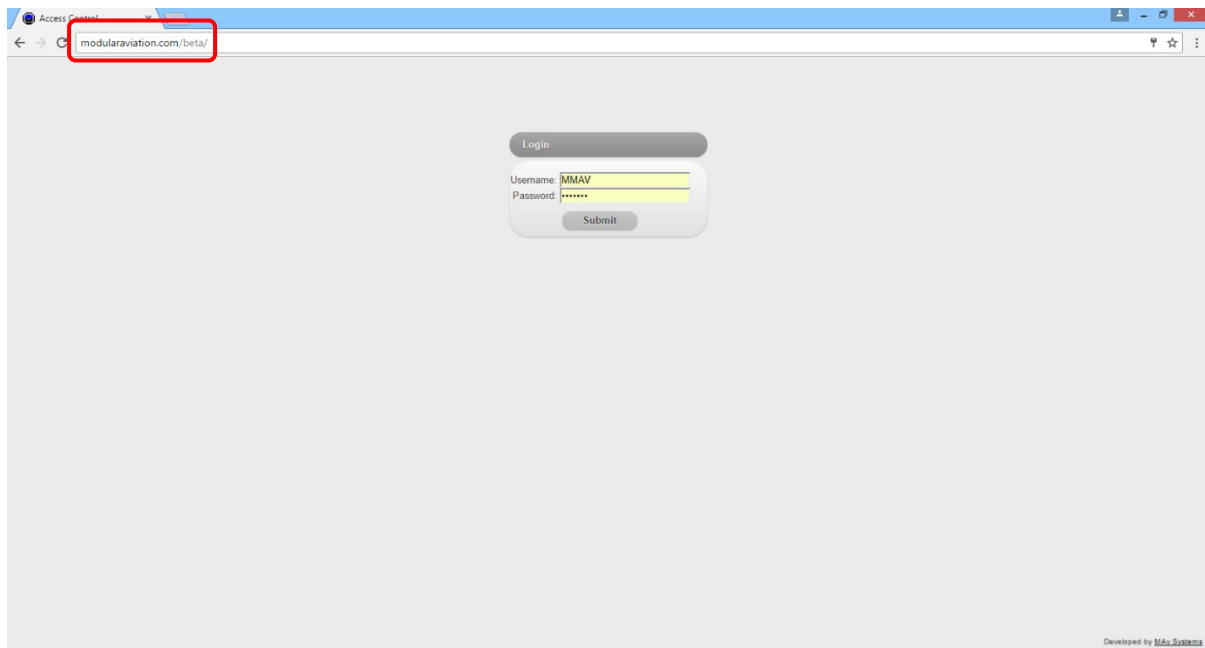
An additional feature to ECAS is EIMS, the Electronic Inventory Management System. EIMS is an add-on, the “Warehouse” function, which can provide full store control capabilities including generation of Purchase Orders.

EIMS keeps track of all Purchase Orders and communicates with the Electronic Continuing Airworthiness System for traceability of parts. The part is traced until it is finally removed from the A/C as unserviceable and returned to the repair shop accompanied by an auto generated Unserviceable Tag.

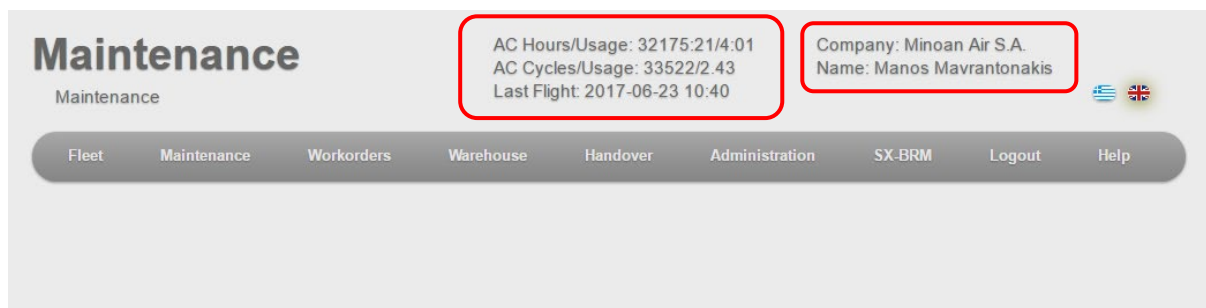
Additional features, such as reliability analysis, maintenance costing, barcode reading, manhour statistics etc., can be added to ECAS to accommodate the customers’ needs.

The Interface

- Online access from any internet device using the predetermined url and a web browser:



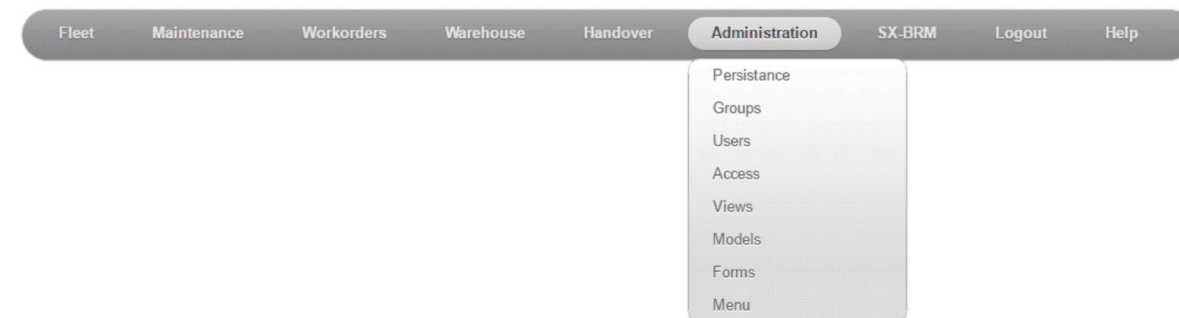
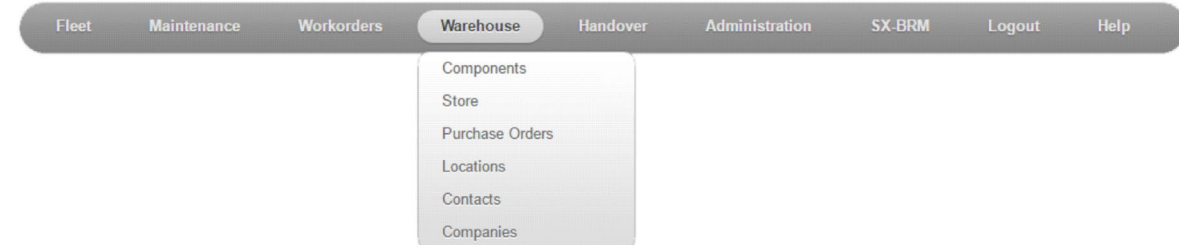
- Aircraft usage and user details are shown on the top of each page:



- Aircraft to be displayed can be chosen from the drop down list:



- User friendly, drop down menu has been accomodated for ease of use:



Fleet

Fleet
Maintenance
Workorders
Warehouse
Handover
Administration
SX-BRM
Logout
Help

Logbook

Fokker Fleet

The Fleet menu provides access to the Aircraft Technical Log Book and is linked with the aircraft online documentation manual (if available).

Logbook:

The log book feature provides a facility for storing Aircraft Log Pages, specifically minute-resolution times and landings. Log pages can then be used by work orders for referencing and in maintenance for estimating average flight time and cycles.

- Entry by user for each ATL:
 - 1) Takeoff Date & Time
 - 2) Landing Date & Time
 - 3) Cycles
 - 4) Remarks (PIREP, Work performed etc.)

Log Page
#1522
Close

Takeoff:
2017-06-23 10:40

Landing:
2017-06-23 15:35

Submit

Landings:
1

Remarks:

- System calculates duration of flight and total Flight Hours & Cycles of the aircraft and displays the remarks entered for each ATL.

Logbook

AC Hours/Usage: 32175:21/4:01

AC Cycles/Usage: 33522/2.43

Last Flight: 2017-06-23 10:40

Company: Minoan Air S.A.

Name: Manos Mavrantonakis

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Logpage
Descending
Sort

Create

Logpage	Takeoff	Landing	Duration	Landings	Hours	Cycles	Remarks
1407	2013-07-15 16:55	2013-07-15 17:15	0:20	1	32095.31	33430	
1406	2013-07-15 15:50	2013-07-15 16:10	0:20	1	32095.11	33429	
1405	2013-07-15 14:40	2013-07-15 15:25	0:45	1	32094.51	33428	
1404	2013-07-15 13:15	2013-07-15 14:00	0:45	1	32094.06	33427	
1403	2013-07-15 11:35	2013-07-15 12:35	1:00	1	32093.21	33426	
1402	2013-07-15 09:45	2013-07-15 10:50	1:05	1	32092.21	33425	
1401	2013-07-15 00:00	2013-07-15 00:00	0:00	0	32091.16	33424	
1400	2013-07-15 00:00	2013-07-15 00:00	0:00	0	32091.16	33424	Check of the pressure and return filter magnetic indicators c/o law MVO/BRMS/2943. Check the pressure on the gauges of the portable passenger oxygen cylinders checked law MVO/BRMS/2930. Inspection of the position of the mechanical pop-out of the scavenge oil filter c/o law MVO/BRMS/2948. 3day inspection carried out law MVO/BRMS/2987. Inspection of the reservoir hydraulic fluid level c/o law MVO/BRMS/2944.
1399	2013-07-15 00:00	2013-07-15 00:00	0:00	0	32091.16	33424	Inspection of the magnetic indicators of the chip detectors of the reduction gearbox and the main tank c/o law MVO/BRMS/2945. Inspection of the magnetic indicators of the chip detectors of the reduction gearbox and the main tank c/o law MVO/BRMS/2946. LH engine oil level checked law MVO/BRMS/2941. RH engine oil level checked law MVO/BRMS/2942.
1398	2013-07-15 07:00	2013-07-15 07:20	0:20	1	32091.16	33424	RH engine oil indicator inspected law MVO/BRMS/2938. LH engine oil indicator inspected law MVO/BRMS/2937. LH engine oil level checked law MVO/BRMS/2935. RH engine oil level checked law MVO/BRMS/2940.
1397	2013-07-15 06:05	2013-07-15 06:25	0:20	1	32090.56	33423	
1396	2013-07-13 22:25	2013-07-13 22:45	0:20	1	32090.36	33422	
1395	2013-07-13 21:40	2013-07-13 22:05	0:25	1	32090.16	33421	
1394	2013-07-13 15:30	2013-07-13 16:15	0:45	1	32089.51	33420	
1393	2013-07-13 14:00	2013-07-13 14:50	0:50	1	32089.06	33419	
1392	2013-07-13 12:35	2013-07-13 13:15	0:40	1	32088.16	33418	
1391	2013-07-13 11:20	2013-07-13 12:00	0:40	1	32087.36	33417	
1390	2013-07-13 07:45	2013-07-13 08:05	0:20	1	32086.56	33416	
1389	2013-07-13 06:55	2013-07-13 07:15	0:20	1	32086.36	33415	
1388	2013-07-12 17:00	2013-07-12 17:30	0:30	1	32086.16	33414	

As an Option, fuel consumption can be stored in order to calculate emission statistics and efficiency.

Maintenance



The Maintenance menu provides access to the aircraft Inventory (all current components installed on the aircraft as well as the history of each component) and the Maintenance of the aircraft.

Maintenance:

- Maintenance has two main functions:
 - 1) Setup – Initial tasks that are added to the system.
 - 2) Maintenance – Due maintenance based on Last Carried Out and completed Work Orders.

1) Maintenance – Setup

Maintenance

Maintenance

AC Hours/Usage: 32175:21/4:01
AC Cycles/Usage: 33522/2.43
Last Flight: 2017-06-23 10:40

Company: Minoan Air S.A.
Name: Manos Mavrantanakis

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Reference Descending Sort Create Copy Effective From: Set All Effective

Search:

Reference	Properties	Documentation	Components	Description	Threshold	Interval
MRB: 531000-00-36	Program: Structural Maintenance ATA: FUSELAGE MANN STRUCTURE Counter: Airframe Task: Unverified Category: Unverified	AMM 32-21-00-210-816	Positions: - [EFF]	FUSELAGE Detailed inspection of the nose landing gear bracket plate lgr.	50000 Cycles	50000 Cycles
MRB: 531000-00-35	Program: Structural Maintenance ATA: FUSELAGE MANN STRUCTURE Counter: Airframe Task: Unverified Category: Unverified	AMM 53-11-00-210-826	Positions: - [EFF]	FORWARD FUSELAGE Detailed inspection of the front fuselage skin and strips just forward of window post no. 1	25000 Cycles	25000 Cycles
MRB: 531000-00-33	Program: Structural Maintenance ATA: FUSELAGE MANN STRUCTURE Counter: Airframe Task: Unverified Category: Unverified		Positions: - [EFF]	FUSELAGE (EXT) General visual inspection of the fuselage skin above the cut-out for the external power supply access panel	70000 Cycles	10700 Cycles
MRB: 531000-00-26	Program: Serviceability Limitations Item ATA: FUSELAGE MANN STRUCTURE Counter: Airframe Task: Unverified Category: Unverified	NDT MANUAL	Positions: - [EFF]	FUSELAGE Special detailed inspection of the skin lap joints at stringer 192 and 153, between sta 3100 and 8675	82400 Cycles	8700 Cycles
MRB: 531000-00-25	Program: Serviceability Limitations Item ATA: FUSELAGE MANN STRUCTURE Counter: Airframe Task: Unverified Category: Unverified	NDT PART 6: 53-10-01	Positions: - [EFF]	FUSELAGE Special detailed inspection of the skin lap joints at stringer 20 and 32, between sta 3100 and the partial pressure bulkhead	42400 Cycles	5100 Cycles
MRB: 531000-00-24	Program: Serviceability Limitations Item ATA: FUSELAGE MANN STRUCTURE Counter: Airframe Task: Unverified Category: Unverified	NDT PART 6: 53-10-02	Positions: - [EFF]	FUSELAGE Special detailed inspection of the skin lap joints at stringer 117 and 141, between sta 8225 and 8675	58400 Cycles	7200 Cycles
MRB: 531000-00-23	Program: Serviceability Limitations Item ATA: FUSELAGE MANN STRUCTURE Counter: Airframe Task: Unverified Category: Unverified	NDT MANUAL	Positions: - [EFF]	FUSELAGE Special detailed inspection of the skin lap joints at stringer 117 and 141, between sta 4550 and 8225	72800 Cycles	2000 Cycles
MRB: 531000-00-22	Program: Structural Maintenance ATA: FUSELAGE MANN STRUCTURE Counter: Airframe Task: Unverified Category: Unverified	AMM 53-12-00-210-856	Positions: - [EFF]	FUSELAGE Detailed inspection of the fuselage skin at the connection to the sliding window frame at the lower side	52000 Cycles	18000 Cycles
MRB: 531000-00-11	Program: Safe Life Item ATA: FUSELAGE MANN STRUCTURE Counter: Airframe	AMM 53-10	Positions:	FUSELAGE		75000 Cycles

During the initial setup of the system the tasks are inserted using a specific excel layout that is uploaded to the system and can be used for all aircraft that share the same MP. Applicability for each aircraft can be determined in the same excel file. After initial setup, new tasks can be added by using the Create button:

Submit Close

Type:

Reference:

Parent:

Other:

Program:

Counter:

Task:

Category:

Hours: Threshold Interval

Cycles:

Calendar:

Event:

Group:

ATA Chapter:

Title:

Description:

Documentation:

Notes:

Part Numbers:

Positions:

Remarks:

2) Maintenance

Maintenance

AC Hours/Usage: 32175:21/4.01

AC Cycles/Usage: 33522/2.43

Last Flight: 2017-06-23 10:40

Company: Minoan Air S.A.

Name: Manos Mavrantanakis

Fleet Maintenance Workorders Warehouse Handover Administration SX-BRM Logout Help

Prediction Descending Sort

Search:

Reference	Description	Position	Component	Life	Limit	Carried Out	Remaining	Prediction
MRB 256400-00-01	UNV LIFE VESTS Restoration check of the life vests.	-	FOKKER 27 MK050 20207	2017-12-03	5Y	(A) 2012-10-31	-1M -2D	-1M -3D (D)
MRB 324400-00-10	UNV BRAKE CONTROL Operational check of alternate brake system.	-	FOKKER 27 MK050 20207	2017-12-03	6M	(A) 2017-05-30	-3D	-3D (D)
MRB 243000-01-03	UNV BATTERY RESTORATION OF THE BATTERIES	RH LH	4078-8 R01944 4078-8 S04852	1655 50H 2017-12-03 4768 51H 2017-12-03	1000 00H 6M 1000 00H 6M	(A) 1639 05H 2017-05-30 (A) 4752 06H 2017-05-30	963 15H -3D 983 15H -3D	-3D (D) -3D (D)
MRB 781200-02-02	UNV AUTO FLT/IDLE STOP OPERATIONAL CHECK OF THE AUTOMATIC FLIGHT/IDLE STOP MECHANISM (SOLENOIDS) ON THE ENGINES.	-	FOKKER 27 MK050 20207	32175:21H	9 00H	(A) 32164:31H	-1:50H	Today (H)
MRB 721001-00-02	UNV ENGINE DETAILED INSPECTION OF THE MAGNETIC INDICATORS OF THE CHIP DETECTORS OF THE REDUCTION GEARBOX AND THE MAIN OIL TANK.	LH RH	3035600 125063 3035600 125081	19098 10H 19189 45H	65 00H 65 00H	(A) 19081:25H 19173 00H	48:15H 48:15H	11D (H) 11D (H)
MRB 241000-00-02	UNV IDG OIL SYSTEM DETAILED INSPECTION OF THE INTEGRATED DRIVE GENERATOR OIL LEVEL	LH RH	3035600 125063 3035600 125081	19098 10H 19189 45H	65 00H 65 00H	(A) 19087:20H (A) 19178 55H	54:10H 54:10H	13D (H) 13D (H)
MRB 241000-00-03	UNV IDG OIL SYSTEM DETAILED INSPECTION OF THE DIFFERENTIAL PRESSURE INDICATOR.	LH RH	3035600 125063 3035600 125081	19098 10H 19189 45H	65 00H 65 00H	(A) 19087:20H (A) 19178 55H	54:10H 54:10H	13D (H) 13D (H)
MRB 291000-00-06	UNV HYDRAULIC SYSTEM DETAILED INSPECTION OF THE RESERVOIR HYDRAULIC FLUID LEVEL	-	FOKKER 27 MK050 20207	32175:21H	120:00H	32158:36H	103:15H	25D (H)
MRB 261100-00-02	OPC ENG FIRE DETECTION Operational check of both engines fire detection and warning system.	-	FOKKER 27 MK050 20207	32175:21H	125:00H	32158:36H	108:15H	26D (H)
MRB 282300-00-02	UNV FUEL CROSSPEED SYS Operational check of the crossfeed system.	-	FOKKER 27 MK050 20207	32175:21H	1500:00H	30900:02H	224:41H	1M 25D (H)
AD: 2013-02 CF	UNV First Stage Power Turbine Blade Failure Within 60 months from the effective date of this AD or any time when the affected engine is disassembled and accessed perform a one time	-	FOKKER 27 MK050 20207	2017-12-03	5Y	(A) 2013-01-31	1M 28D	1M 28D (D)

Maintenance is a colour coded view of all due maintenance based on the component last carried out and interval of each task. The user can decide when each workorder should be raised in order for the Part-145 organisation to be able to access such workorders. This is done by selecting a task, choosing the Part-145 organisation that will perform the task and pressing the Issue Workorder button.

Task Type: Audit			Delete Audit	Submit	Close
Task Information		Issue Information		Last Carried Out	
Task Reference: 256400-00-01		Performed By: ▼		Workorder Reference: ATP/2253	
Component: FOKKER 27 MK050 20207		Due Hours: []	Due Cycles: []	Hours: []	
Status: []		Due Date: 2017-10-31	Issue Date*: []	Cycles: []	
		* only if different from today		Date: 2012-10-31 00:00	
		Critical Item: <input type="checkbox"/>			
		Issue Workorder		Issue Task Audit	

Inventory:

Using the stored log pages and the work orders that were signed to install or remove each component, the system automatically generates individual component log pages. This includes propeller and engine log pages. This information is further used to generate a component history and by maintenance to generate tasks relating to life limited parts and overhaul or HIS. Since Inventory and Maintenance are not independent, removing a component automatically changes the forecast information but also informs of any error as it knows how many of each component need to be in the aircraft at any given time.

Maintenance Optional Features:

Forecast: A maintenance forecast works by estimating when tasks need to happen with the highest degree of accuracy. ECAS uses live data coupled with a season modifier to calculate how many hours and cycles an aircraft does. While other systems treat maintenance and the inventory separately, ECAS treats tasks as component-centric. Using the stored log pages and work orders, as well as the approved Maintenance Program, intelligent forecasts can be generated that take the actual usage of the aircraft in to consideration. The efficient algorithm used to calculate the forecast needs very little feedback other than the normal activities of the maintenance team. Just by clicking the “sign” button on a work order, the forecast is updated in real time with the information about the task that was completed – needing no further action by CAMO, reducing work load significantly. On top of giving you the aircraft downtime, a forecast can display the maintenance cost and required parts for each future task.

Reliability: Using additional work orders and unexpected maintenance events, the system provides reports for the reliability of each aircraft in the fleet. This can indicate repeated problems with certain manufacturers or components and can save money when coupled with an accounting module, as it will provide accurate budgets per aircraft.

Reports: Custom reports are provided on every part of the system including inventory, forecasts and reliability. It includes a form designer which creates report and form files that can be used in the system. Add graphics, pictures and any data you need for your company. Third parties can have access to view certain restricted reports, for example the Civil Aviation Authority. Each component has its own log book, history of tasks, documentation and forms. These can be exported when auditing or selling a component.

Workorders



The Workorders menu provides access to the Work orders issued by the CAMO, the additional Work orders raised by the Par-145 Organisation, Opened Deferred Defects of the aircraft and all completed work orders.

Work orders can be manually issued for any upcoming task, or scheduled to automatically be generated for some tasks i.e. the daily/weekly check. Work orders can be created, viewed, signed and printed by the maintenance team or even third party companies. They can contain anything from references to log pages, other work orders or aircraft manuals.

The line has its own view of upcoming tasks which come directly from the maintenance planner. Once a task has been performed and an electronic work order signed (via e-signature), the planner is updated straight away with the completion time, re-computing the forecast live for the planner to see.

Pending

AC Hours/Usage: 32175:21/4:01
 AC Cycles/Usage: 33522/2.43
 Last Flight: 2017-06-23 10:40

Company: Minoan Air S.A.
 Name: Manos Mavrantoukakis

Workorders

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Additional

Prediction	Due	Issued	Reference	Components	Description	Workgroup	Signatures
2D (H)	31861:45 Hours	2015-03-11	MWO.BRS/S4334 721001-00-01		ENGINE Check of the engine oil level.	Meliner s.r.l.	1: Manos Mavrantoukakis
1D (H)	31858:55 Hours	2015-03-11	MWO.BRS/S4331 241000-00-02		IDG OIL SYSTEM DETAILED INSPECTION OF THE INTEGRATED DRIVE GENERATOR OIL LEVEL	Meliner s.r.l.	1: Manos Mavrantoukakis
1D (H)	31859:30 Hours	2015-03-11	MWO.BRS/S4330 241000-00-02		IDG OIL SYSTEM DETAILED INSPECTION OF THE INTEGRATED DRIVE GENERATOR OIL LEVEL	Meliner s.r.l.	1: Manos Mavrantoukakis
2D (H)	31861:45 Hours	2015-03-11	MWO.BRS/S4332 721001-00-01		ENGINE Check of the engine oil level.	Meliner s.r.l.	1: Manos Mavrantoukakis
27D (H)	31949:45 Hours	2015-03-12	MWO.BRS/S4342 291000-00-06		HYDRAULIC SYSTEM DETAILED INSPECTION OF THE RESERVOIR HYDRAULIC FLUID LEVEL	Meliner s.r.l.	1: Manos Mavrantoukakis

A permission system makes sure only authorised workers can sign certain tasks. Different Part 145 users, depending on their permissions, can assign or sign work orders while providing a full work description that can be later reviewed and approved by the CAMO. Documentation directly from the manufacturer can also be printed with the work order.

Completed		AC Hours/Usage: 32175:21/4:01		Company: Minoan Air S.A.			
Workorders / Completed		AC Cycles/Usage: 33522/2.43		Name: Manos Mavrantonis			
		Last Flight: 2017-06-23 10:40					
<div style="display: flex; justify-content: space-between;"> Completed ▾ Descending ▾ Sort Search: <input type="text"/> </div>							
Completed	Due	Issued	Reference	Components	Description	Workgroup	Signatures
ATL 1441 2013-07-20	32123.16 Hours	2013-07-16	MWO/BRM/S/2999 721801-00-01		ENGINE Check of the engine oil level.	Minoan Air S.A.	I. Eki Kalafati A. Nikos Manoussogiorgakis M. Nikos Manoussogiorgakis S. Nikos Manoussogiorgakis
ATL 1417 2013-07-17	2013-07-23	2013-07-16	MWO/BRM/S/2995 353000-00-03		PORTABLE PAX OXYGEN Check the pressure on the gauges of the portable passenger oxygen cylinders.	Minoan Air S.A.	I. Eki Kalafati A. Nikos Manoussogiorgakis M. Nikos Manoussogiorgakis
ATL 1417 2013-07-17	2013-07-18	2013-07-16	MWO/BRM/S/2994 3D/F27/88-50		THREE DAY INSPECTION Three days inspection to be carried out.	Minoan Air S.A.	I. Eki Kalafati A. Nikos Manoussogiorgakis M. Nikos Manoussogiorgakis
ATL 1417 2013-07-17	2013-07-21	2013-07-11	MWO/BRM/S/2978 324800-00-19		BRAKE CONTROL Operational check of alternate brake system.	Minoan Air S.A.	I. Eki Kalafati A. Nikos Manoussogiorgakis M. Nikos Manoussogiorgakis
ATL 1417 2013-07-17	32115.08 Hours	2013-07-11	MWO/BRM/S/2983 612000-00-03		PROPELLER SYSTEM DETAILED INSPECTION OF THE MAGNETIC INDICATOR OF THE PROPELLER ELECTRONIC CONTROLLER.	Minoan Air S.A.	I. Eki Kalafati A. Nikos Manoussogiorgakis M. Nikos Manoussogiorgakis
ATL 1419 2013-07-17	32132.18 Hours	2013-07-16	MWO/BRM/S/2997 262400-00-02		BCF TYPE EXTING DETAILED INSPECTION OF THE BCF TYPE EXTINGUISHER IN THE FLIGHT COMPARTMENT.	Minoan Air S.A.	I. Eki Kalafati A. Nikos Manoussogiorgakis M. Nikos Manoussogiorgakis
ATL 1418 2013-07-17	32115.08 Hours	2013-07-11	MWO/BRM/S/2985 731102-00-01		ENGINE FUEL AND CTL DETAILED INSPECTION OF THE MAGNETIC INDICATOR OF THE FUEL HEATER FILTER BY-PASS.	Minoan Air S.A.	I. Eki Kalafati A. Nikos Manoussogiorgakis M. Nikos Manoussogiorgakis
ATL 1418 2013-07-17	32132.18 Hours	2013-07-16	MWO/BRM/S/2996 291000-00-05		HYDRAULIC SYSTEM Draining of the seal-drain and overflow tank.	Minoan Air S.A.	I. Eki Kalafati A. Nikos Manoussogiorgakis M. Nikos Manoussogiorgakis
ATL 1419 2013-07-17	32115.08 Hours	2013-07-11	MWO/BRM/S/2980 716200-00-01		ENGINE AIR INTAKE General visual inspection of the engine intake ducting.	Minoan Air S.A.	I. Eki Kalafati A. Nikos Manoussogiorgakis M. Nikos Manoussogiorgakis
ATL 1418 2013-07-17	32115.08 Hours	2013-07-11	MWO/BRM/S/2984 731102-00-01		ENGINE FUEL AND CTL DETAILED INSPECTION OF THE MAGNETIC INDICATOR OF THE FUEL HEATER FILTER BY-PASS.	Minoan Air S.A.	I. Eki Kalafati A. Nikos Manoussogiorgakis M. Nikos Manoussogiorgakis
ATL 1419 2013-07-17	2013-07-17	2013-07-17	MWO/BRM/S/3005 MWO/BRM/S/2994		During 3D insp. found LH LDG light US.	Minoan Air S.A.	I. Nikos Manoussogiorgakis A. Nikos Manoussogiorgakis M. Nikos Manoussogiorgakis
ATL 1419 2013-07-17	32115.08 Hours	2013-07-11	MWO/BRM/S/2981 716200-00-01		ENGINE AIR INTAKE General visual inspection of the engine intake ducting.	Minoan Air S.A.	I. Eki Kalafati A. Nikos Manoussogiorgakis M. Nikos Manoussogiorgakis
ATI 1418			MWO/BRM/S/2983		PROPELLER SYSTEM DETAILED INSPECTION OF		I. Eki Kalafati

The planner is able to Install/Remove components from specific Work Orders, ensuring that all components replaced on the aircraft have traceability.

The components are automatically updated in Maintenance and used in other functions of the system as well.

Workorder MWO/BRM/S/2999
Print Delete Close

Work Description:

JIC clout uplift 4 Qts.

Components:

Install Component

Remove Component

Delete Entry

Status: Completed

Logpage:

Date:

Warehouse



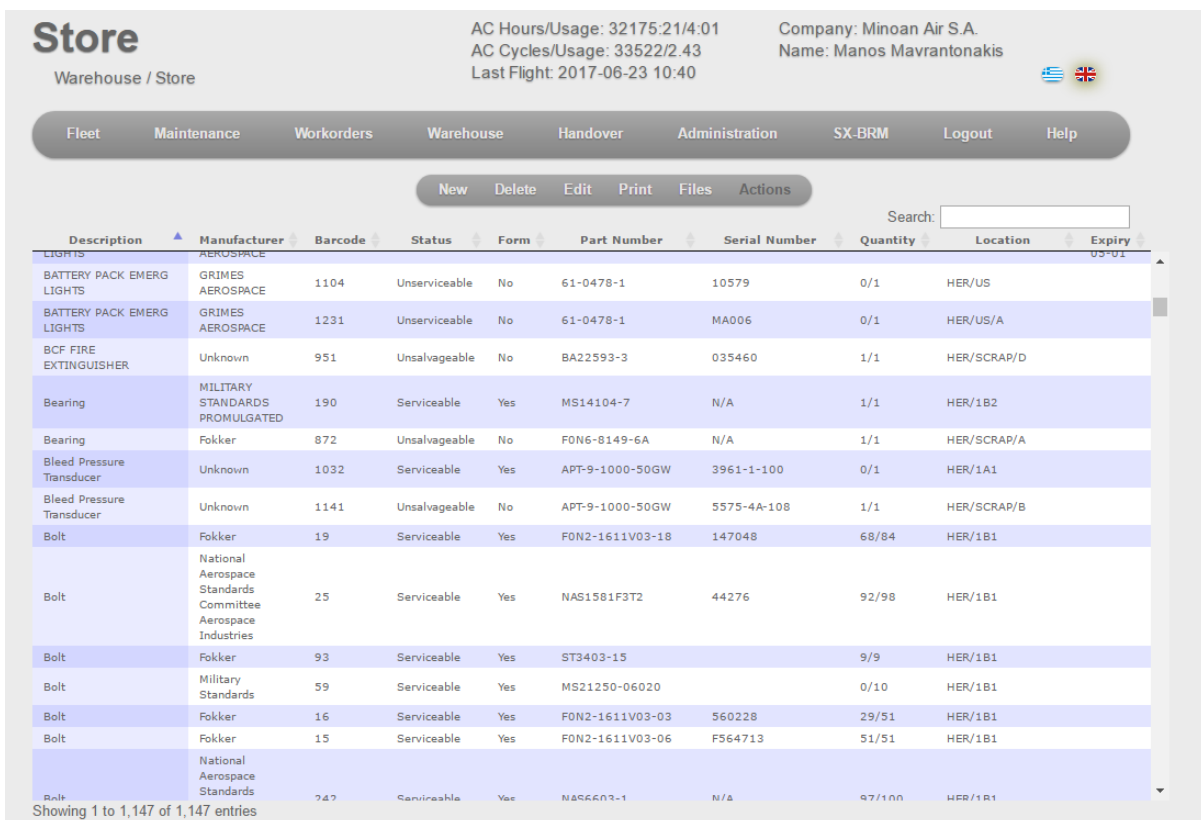
Fleet Maintenance Workorders **Warehouse** Handover Administration SX-BRM Logout Help

- Components
- Store
- Purchase Orders
- Locations
- Contacts
- Companies

The Warehouse menu provides access to EIMS, an add-on of ECAS that provides full store control capabilities including generation of Purchase Orders.

Store:

On top of having an inventory of all components required to perform maintenance, the EIMS software allows you to store your entire warehouse. It tracks all components located in the Store as well as the components that leave the aircraft, where they go, and in what condition they are. You can specify location and upload Form-1s or other relevant documentation of a component. It supports serialised items as well as loose consumables. Tags are automatically generated based on the component condition. EIMS can produce reports on what items are needed based on maintenance forecasts and optionally it can automatically create purchase orders to be approved by a member of staff if the stock is low.



Store Warehouse / Store

AC Hours/Usage: 32175:21/4:01 Company: Minoan Air S.A.
 AC Cycles/Usage: 33522/2.43 Name: Manos Mavrantanakis
 Last Flight: 2017-06-23 10:40

Fleet Maintenance Workorders **Warehouse** Handover Administration SX-BRM Logout Help

New Delete Edit Print Files Actions

Search:

Description	Manufacturer	Barcode	Status	Form	Part Number	Serial Number	Quantity	Location	Expiry
BATTERY PACK EMERG LIGHTS	GRIMES AEROSPACE	1104	Unserviceable	No	61-0478-1	10579	0/1	HER/US	US*01
BATTERY PACK EMERG LIGHTS	GRIMES AEROSPACE	1231	Unserviceable	No	61-0478-1	MA006	0/1	HER/US/A	
BCF FIRE EXTINGUISHER	Unknown	951	Unsalvageable	No	BA22593-3	035460	1/1	HER/SCRAP/D	
Bearing	MILITARY STANDARDS PROMULGATED	190	Serviceable	Yes	MS14104-7	N/A	1/1	HER/1B2	
Bearing	Fokker	872	Unsalvageable	No	F0N6-8149-6A	N/A	1/1	HER/SCRAP/A	
Bleed Pressure Transducer	Unknown	1032	Serviceable	Yes	APT-9-1000-50GW	3961-1-100	0/1	HER/1A1	
Bleed Pressure Transducer	Unknown	1141	Unsalvageable	No	APT-9-1000-50GW	5575-4A-108	1/1	HER/SCRAP/B	
Bolt	Fokker	19	Serviceable	Yes	F0N2-1611V03-18	147048	68/84	HER/1B1	
Bolt	National Aerospace Standards Committee Aerospace Industries	25	Serviceable	Yes	NAS1581F3T2	44276	92/98	HER/1B1	
Bolt	Fokker	93	Serviceable	Yes	ST3403-15		9/9	HER/1B1	
Bolt	Military Standards	59	Serviceable	Yes	MS21250-06020		0/10	HER/1B1	
Bolt	Fokker	16	Serviceable	Yes	F0N2-1611V03-03	560228	29/51	HER/1B1	
Bolt	Fokker	15	Serviceable	Yes	F0N2-1611V03-06	F564713	51/51	HER/1B1	
Bolt	National Aerospace Standards	242	Serviceable	Yes	NAS6603-1	N/A	97/100	HER/1B1	

Showing 1 to 1,147 of 1,147 entries

Different stores for different locations can be created and accessed independently or all together, allowing the user to find a component even if it is located at a different line station.

Purchase Orders:

Fleet Maintenance Workorders Warehouse Handover Administration SX-BRM Logout Help

New Delete Edit Print Files **Actions**

- Cancel
- Authorise
- Receive
- Pay

Purchase Orders can be generated and printed in pdf format through EIMS.

Purchase Orders

Warehouse / Purchase Orders

AC Hours/Usage: 32175:214:01
 AC Cycles/Usage: 33522/2.43
 Last Flight: 2017-06-23 10:40

Company: Minoan Air S.A.
 Name: Manos Mavrantonakis

Fleet Maintenance Workorders Warehouse Handover Administration SX-BRM Logout Help

New Delete Edit Print Files Actions

Search:

Reference	Company	Date	Issuer	Type	Status
T PO/648	MSI Aircraft Maint. Services Intl GmbH	2016-01-11	Manos Mavrantonakis	Repair	Authorised / Unpaid
T PO/647	MSI Aircraft Maint. Services Intl GmbH	2015-12-11	Manos Mavrantonakis	Outright	Received / Paid
T PO/646	SAMCO Aircraft Maintenance B.V.	2015-09-28	Manos Mavrantonakis	Repair	Received / Paid
✗ PO/645	SAMCO Aircraft Maintenance B.V.	2015-09-28	Manos Mavrantonakis	Repair	Cancelled
T PO/644	Greek Air	2015-09-18	Manos Mavrantonakis	Outright	Received / Paid
T PO/643	Apella S.A.	2015-09-15	Manos Mavrantonakis	Outright	Received / Paid
T PO/642	ROEDER-PRAEZISION	2015-09-08	Manos Mavrantonakis	Repair	Received / Paid
T PO/641	TP AEROSPACE SOLUTIONS	2015-08-31	Manos Mavrantonakis	Outright	Received / Paid
✗ PO/640	TP AEROSPACE SOLUTIONS	2015-08-31	Manos Mavrantonakis	Outright	Cancelled
T PO/639	SAMCO Aircraft Maintenance B.V.	2015-08-24	Manos Mavrantonakis	Repair	Received / Paid
T PO/638	SAMCO Aircraft Maintenance B.V.	2015-08-24	Manos Mavrantonakis	Repair	Received / Paid
T PO/637	MSI Aircraft Maint. Services Intl GmbH	2015-08-13	Manos Mavrantonakis	Outright	Received / Paid
T PO/636	Vector Aerospace France	2015-08-11	Manos Mavrantonakis	Repair	Received / Paid
T PO/635	TP AEROSPACE SOLUTIONS	2015-08-11	Manos Mavrantonakis	Exchange	Received / Paid
✗ PO/624	TP AEROSPACE SOLUTIONS	2015-08-10	Manos Mavrantonakis	Exchange	Cancelled
T PO/633	Scandinavian Avionics	2015-07-30	Manos Mavrantonakis	Repair	Received / Paid
T PO/632	MSI Aircraft Maint. Services Intl GmbH	2015-07-13	Manos Mavrantonakis	Outright	Received / Paid
T PO/631	SAMCO Aircraft Maintenance B.V.	2015-07-10	Manos Mavrantonakis	Repair	Received / Paid
T PO/630	Amapola	2015-07-09	Manos Mavrantonakis	Exchange	Received / Paid
T PO/629	Fokker Services B.V.	2015-07-07	Manos Mavrantonakis	Exchange	Received / Paid
T PO/628	Greek Air	2015-07-06	Manos Mavrantonakis	Outright	Received / Paid
T PO/627	MSI Aircraft Maint. Services Intl GmbH	2015-06-29	Manos Mavrantonakis	Exchange	Received / Paid
T PO/626	Fokker Services B.V.	2015-06-09	Manos Mavrantonakis	Outright	Received / Paid
T PO/625	MSI Aircraft Maint. Services Intl GmbH	2015-06-09	Manos Mavrantonakis	Outright	Received / Paid
✗ PO/624	Fokker Services B.V.	2015-06-08	Manos Mavrantonakis	Outright	Cancelled

Showing 1 to 648 of 648 entries

New Item

Purchase Order Ref:
 Work Order Ref:
 When was it issued?:
 Currency:
 VAT:

Quote Reference:
 Type:
 Tracking Reference:
 Tracking Company:

Purchase Company:
 Purchase Contact:
 Delivery Company:
 Delivery Contact:

Remarks:

New Delete Edit

Item#	Description	Serial#	Part#	Qty	Unit	Price
No data available in table						

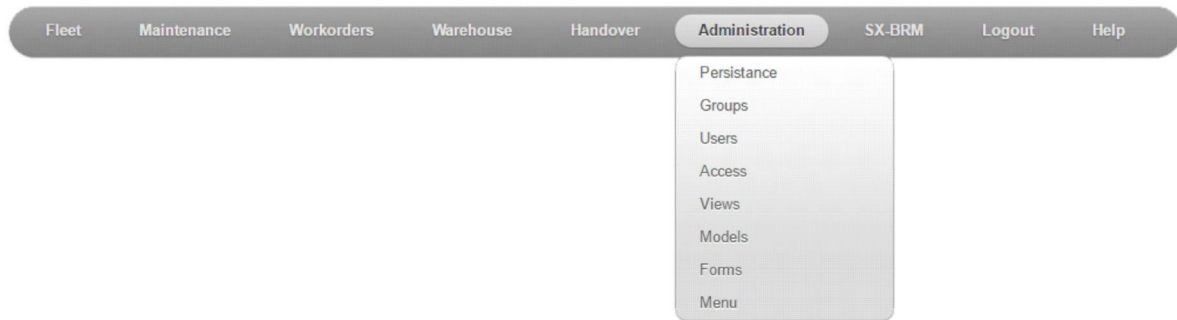
Submit Cancel

The parts ordered through EIMS are linked and track with the store.

A Specific purchase order is marked as received once all parts contained have been entered in the stores.

Purchase orders can also be requested by line staff, which then have to be authenticated and signed by an approved person before they are sent.

Administration



The Administration menu provides the administrator with access to determine the users required to work on the system and which functions each user can access.


System users can be granted permissions independently or in groups. The modular nature of the system means that every action, view and model has an independent permission on whether to allow read or write. This allows flexibility in allowing access to different staff types or even third parties.

Access

Administration / Access

AC Hours/Usage: 32175:21/4:01
AC Cycles/Usage: 33522/2.43
Last Flight: 2017-06-23 10:40

Company: Minoan Air S.A.
Name: Manos Mavrantoukakis



Fleet
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SX-BRM
Logout
Help

Submit

Menu Restrictions	Accounts	CAMO	Part 145	Stores	User
	Read	Read	Read	Read	Read
acas/components	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
acas/craft	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
acas/fleet	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
acas/fokkerfleet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
acas/handover	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
acas/help	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
acas/logbook	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
acas/maintenance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
acas/setup	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
acas/setup/airports	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
acas/setup/fleet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
acas/setup/inventory	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
acas/setup/maintenance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
acas/setup/manufacturers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
acas/setup/partnumbers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
acas/setup/taskgroups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
acas/warehouse	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
acas/warehouse/companies	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
acas/warehouse/components	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
acas/warehouse/contacts	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
acas/warehouse/locations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Persistence: The unique persistence system provides targeted regular backups in format neutral compressed files. Important parts of the system are backed up off-site almost every few minutes. The interface allows system admins to backup and restore within seconds, anywhere in the world.

Technical Implementation

The software solution is fully hosted and provided as a modern web interface based on Angular. A progressive web app also is in development to provide offline caching for mobile devices to store forecasts, work orders and other documentation. A lot of the functionalities are provided as a REST API for the user to extend and for easy integration with other systems. We can also support, if needed, bridging with other systems via XML or EDIFACT. The backend is written in C++14 and provides responses with very little latency. We use a PostgreSQL database for strong referential integrity, but provide a Couchbase caching layer for speed.

Future Development

We are looking into augmented reality devices that can interface directly with our software and provide line maintenance with a hands-free solution when performing tasks. We are planning to overlay specific information, steps and manufacturer documentation to augment the engineer, save time and ultimately money by optimizing the tasks. Engineers can also collaborate remotely and ask for live assistance from more experienced people in faraway locations.