open book exam 2010

AIRMAINTENANCE UPDATE is Transport Canada-approved for recurrent training. This is our eighth exam, published annually in our June/July anniversary issue, in accordance with our agreement with Transport Canada. The exam consists of questions based on articles appearing in all six issues from the past year: June/July 2009, August/September 2009, October/November 2009, December 2009/January 2010, February/March 2010, and April/May 2010. You will require all six issues in order to write the exam. If you are missing any issues, call us at (604) 214-9824, or email us at amu.magazine@telus.net, and we will mail them to you at a cost of $6.95 per magazine postpaid.

A 75% pass rate is required in order to qualify for your 16 hours towards RT. The questions in the exam are arranged in order of their appearance in AirMaintenance Update according to issue and individual article. The exam can also be accessed and printed from our web site: www.amumagazine.com. Answers should be printed in the spaces provided, and must be drawn directly from the text of the articles in order to be considered correct. All questions requiring a longer answer than the space allowed must be type-written on a separate sheet of paper. Completed exams should be submitted to: AIRMAINTENANCE UPDATE, Suite 2–203, 4360 Agar Drive, Richmond, BC, V7B 1A3. The exam must be postmarked no later than October 31, 2010. We will mark your test and return it along with documentation supporting your submission. We will keep a copy of your written test and results on file for future reference, and a copy will be forwarded to Transport Canada.

— Good luck again to all participants!

YOUR CONTACT INFORMATION

For a prompt and accurate response to your 2010 Exam answers, please fill in the following information (print clearly).

Name:.....

Address:.....

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June–July 2009 (Volume 8/Issue 1)

Troubleshooting Techniques Explained

1) What is the first step to take, if possible, in troubleshooting a flight-crew-reported defect?

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2) Which documents should be read carefully before commencing any work on an aircraft?

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3) What is critical for a technician to understand before commencing troubleshooting on a snagged system?

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4) What should be checked first when a snag is reported by a flight crew?

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5) Name five obvious things to check with a flight-crew-reported snag.

1. .....
2. .....
3. .....
4. .....
5. .....

6) Name two types of resources at the technician's disposal that can aid with troubleshooting.

1. .....
2. .....

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7) Name a costly and often ineffective approach to troubleshooting.

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8) What are the three principal tools needed to perform visual inspections of wiring?

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FADEC (Full Authority Digital Engine Control)

9) To what degree is ambient air compressed in the compressor section of an RR250 C30 engine?

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10) What is the basic function of the fuel management system?

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11) Name the three basic ways that fuel is managed in a turbine engine.

1. .....
2. .....
3. .....
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12) Name the three main features that FADEC gives.

1. .....
2. .....
3. .....
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13) Name four ways that a FADEC system reduces pilot workload.

1. .....
2. .....
3. .....
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4. .....

14) How does a FADEC system enhance safety of flight?

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15) Name two ways that a FADEC system simplifies maintenance troubleshooting.

1. .....
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2. .....
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16) Name the two major components of a FADEC system.

1. .....
2. .....

17) What is used as a backup system in case of electronic system malfunction?

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Turbine Component Repair and Recoat

18) Name two key processes needed to complete overhaul and repair of turbine components.

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19) What process is used in the stripping of turbine components?

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20) Name an advantage of vapor-coating a turbine component.

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21) What is the purpose of the coating on a turbine component?

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22) What is involved in the metallurgical evaluation of a set of turbine blades?

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23) Name four conditions that are monitored when the base metal of a turbine section is evaluated.

1. .....
2. .....
3. .....
4. .....

Safety Management Systems (SMS)

24) What is a Safety Management System?

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25) Does a strong safety culture in an organization effect profitability?

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26) Name seven items that need to be part of an effective SMS.

1. .....
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2. .....
3. .....
4. .....
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5. .....
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6. .....
7. .....

August–September 2009 (Volume 8/Issue 2)

FADEC Part 2

1) Name two sources of electrical power for the FADEC system.

1. .....
2. .....

2) State where the four FADEC grounding straps are located.

1. .....
2. .....
3. .....
4. .....

3) Name the three functions of an electronic control unit (ECU).

1. .....
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2. .....
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3. .....
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4) Where are the sensors positioned that report to the ECU?

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5) What do these sensors report to the ECU?

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6) To what component does the ECU transmit the electronic data that it calculates from the information provided by the sensors?

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7) What is the HMU's job?

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8) Through which component does the HMU dispense fuel?

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9) How is the operation of the HMU controlled?

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10) What is the primary reference the ECU uses to schedule fuel flow during starts?

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11) How long does the pilot have to engage the starter after setting the throttle to idle?

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12) When the PLA is moved from the idle to the fly position, how does the HMU enlarge the fuel metering opening?

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13) Name the five faults that will be indicated by instrument panel lights in a FADEC equipped helicopter.

1. .....
2. .....
3. .....
4. .....
5. .....

Any Given Friday

14) Name the three items noted in the release certificate for the borrowed shut-off valve in this article.

1. .....
2. .....
3. .....

Fly By Wire Explained

15) What is the concept behind fly-by-wire?

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16) Name an advantage of FBW technology in a large, transport category aircraft.

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17) How many primary and secondary flight control computers are there in an A330/340?

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18) How many of these computers are required to guide the aircraft safely?

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19) In an Airbus, can the pilot command a maneuver that will exceed the safe operational parameters of the aircraft?

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20) In an Boeing 777, can the pilot command a maneuver that will exceed the safe operational parameters of the aircraft?

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21) Which flight control surface can be mechanically actuated on both Boeing and Airbus aircraft?

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October–November 2009 (Volume 8/Issue 3)

Global Positioning Systems Explained

1) How many satellites does the NAVSTAR GPS system employ?

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2) How often do these satellites orbit the Earth?

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3) Name the three pieces of information transmitted by each satellite.

1. .....
2. .....
3. .....

4) Which of these pieces of information allows the GPS receiver to determine position?

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5) Name three factors that can affect the accuracy of a GPS.

1. .....
2. .....

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3. .....

6) Name another use of the GPS system apart from being a pilot navigation aid.

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7) Name two avionics components separate from the GPS system that make use of GPS information.

1. .....
2. .....

8) How many satellites must a GPS receiver be locked onto in order to get a three-dimensional position fix?

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To PMA Or Not To PMA

9) What does the acronym OEM stand for?

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10) What does the acronym PMA stand for?

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11) What is a PMA part?

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12) Name three types of bogus (suspected unapproved) parts.

1. .....

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2. .....

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3. .....

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Helicopter Composite Structures

13) Can the same methods of repair be used with composite structures as with aluminum structures?

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14) What does a normal composite structure repair consist of?

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15) Name two disadvantages of composite materials used in helicopter structures.

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16) Name two materials used to dissipate the heat caused by a lightening strike to a composite structure.

1. .....
2. .....

17) Is damage as easily seen in a composite or sandwich construction metal structure as in a solid metal structure?

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December 2009–January 2010 (Volume 8/Issue 4)

Weight, Balance, Attitude and Altitude

1) How will overloading affect the performance of a helicopter?

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2) What is affected by the centre of gravity of a helicopter?

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3) Name two places where a pilot can find the weight and balance limits of a helicopter.

1. .....
2. .....

4) Define "useful load".

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5) If a helicopter's fuel tank is located aft of the mast, in which direction will the CG move as fuel is consumed?

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VHF COM systems Explained

6) What is the approximate frequency of the alternating current that passes through a COM antenna when the microphone is keyed?

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7) What type of modulation does an aircraft VHF use?

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8) Name four elements of an airborne VHF COM system.

1. .....
2. .....
3. .....
4. .....

9) What is the purpose of the "Squelch" feature on a VHF COM radio?

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10) What is the ideal length for an antenna?

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11) What is the antenna length for most aircraft applications?

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12) If a quarter wavelength VHF antenna designed to operate at 121.30 MHZ is 24.30" long, how long would a quarter wave DME antenna designed to operate at 1213 MHZ be?

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Staying On Top of Things

13) What are the percentages of errors that happen during regular maintenance versus those that happen during troubleshooting according to Boeing research?

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14) Name four forms that update training can take.

1. .....
2. .....
3. .....
4. .....

February–March 2010 (Volume 8/Issue 5)

Weight, Balance, Attitude and Altitude Part 2

1) What are the two reference data for aircraft altitude?

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2) What is the standard barometric pressure?

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3) What is the standard outside air temperature?

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4) What is the difference between indicated altitude and pressure altitude?

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5) Describe density altitude.

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6) How does the altimeter measure the barometric pressure?

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7) How does the pilot assure that the altimeter only provides usable altitude information?

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8) When does the pilot adjust the Kollsmann window number to something other than reported sea level pressure?

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9) To what does the pilot set the Kollsman window number when flying at or above 18,000 feet?

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10) Name the four factors that affect density altitude.

1. .....
2. .....
3. .....
4. .....

11) When air becomes warmer does its density increase or decrease?

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12) Is humid air more or less dense than dry air?

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High Frequency Communications Systems Explained

13) Why do trans-oceanic flights and remote operations such as those in the Arctic rely on the HF com radio.

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14) What enables HF signals to "skip" off the ionosphere and return to Earth?

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15) What precaution should be taken before making any HF transmissions when the aircraft is on the ground?

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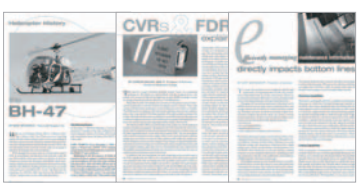
16) Name the three common types of aircraft HF antenna.

1. .....
2. .....
3. .....

17) Name the three different modes that an aircraft HF radio can typically be operated in.

1. .....
2. .....
3. .....

April–May 2010 (Volume 8/Issue 6)



CVRs and FDRs Explained

1) What is the function of the cockpit voice recorder?

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2) Where is the area microphone typically located?

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3) What additional areas, besides the area microphone, does the audio integrating system provide input from?

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4) State two shortcomings of the 30-minute, continuous loop type of CVR.

1. .....

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2. .....

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5) What components are tested with the "test" function on a CVR?

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6) How can the audio quality of a CVR be tested?

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7) When is it possible to use the bulk erase feature of a CVR?

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8) Name two ways that flight data recorders can be activated.

1. .....

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2. .....

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9) What are the five basic parameters that all flight data recorders must record?

1. .....
2. .....
3. .....
4. .....
5. .....■