PHOTOS BY **NED DAWSON & EUROCOPTER**

Through the Looking GLASS

PART 2

The three most important things pilots can do before flight are: preparation, preparation and preparation. GLEN WHITE suggests that good preparation begins by understanding the menus and commands behind those fancy new “glass” faces in the cockpit.

In our homes, in our cars, while at work and on the go, technology is entering every facet of our lives. Gone are the days when the most difficult technical interface was programming our VCRs. In today's world, we can set our DVRs to record from thousands of miles away using our cell phones.

A computer display screen seems to be present in many of today's basic activities. Grocery stores have self-checkout LCDs. Airlines have self check-in LCDs. Cars have touch screen radios with hard drives. Our phones are mini computers that are connected to everything from the web, to email and applications. Computers are showing up in most of our everyday activities. Our lives are getting more and more enveloped within the technological world and this is only going to increase.

The cockpits of our aircraft are no exception to this phenomenon.

The problem is that we have been accustomed to memorizing the operation of the components in our aircraft. We can study an aircraft's fuel system and memorize that when a transfer pump light illuminates we turn off the pump. But it can be far more difficult to remember how to get into the Configure Page of our cockpit display and change the fuel unit of measurement.

One of the tasks that we need to include in the learning of our airframe is "doing". We can sit in ground school or read this article and understand the information presented. But that information then needs to be taken into the cockpit during a non-flying situation and practiced. Until your hands are on the piece of equipment, pushing the buttons, you will not have a useful ability to operate the displays. An important part of study on these displays is plugging in an

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external power source and exploring their features.

In Part 1 of *"Through the Looking Glass"* (Issue 65), we used Eurocopter's VEMD as an example of the basic knowledge that needs to be obtained and absorbed to use an LCD display unit in flight safely. In Part 2, we are going to discuss the knowledge base needed on the unit before start and after shutdown.

As we discussed in Part 1, the VEMD is a very good example for this discussion because of its widespread use and basic design. It is a good example of a cockpit display unit that is somewhat basic (in today's technological world), but without proper training on the device it can be confusing and many of its features can go unused. As with any display system, it was designed to reduce flight crew workload and improve safety. But if the device is not operating properly or has

a failure within it, the distraction can cause an unsafe situation within the cockpit.

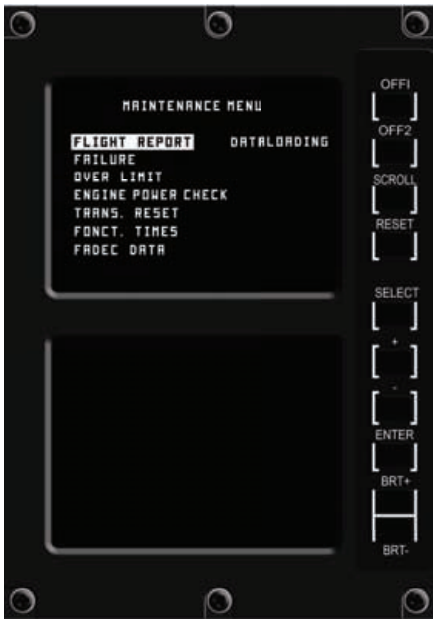
The display functions utilized while the helicopter is shut down can appear to be non-critical to the safe operation of the airframe, but referencing these items can make the difference as to whether a flight occurs or not. The tendency for many pilots is to have the attitude "since it isn't anything I have to worry about in flight, I will figure it out if I need it." The problem is that "figuring it out" can take a very long time and could be the difference between canceling a flight or showing up on time.

There are small differences between the displays used in the Eurocopter models, but as a whole they are very similar (see *HeliOps* Issue 65 for more information). We will use the set-up utilized in the AS350B3/EC130B4 models for this discussion.

The features of the VEMD that we need to have a thorough knowledge of before a flight and after shut down are the Configure Page and the Maintenance Pages. Do not let the names fool you – these are VEMD functions that the pilot in command is required to have a complete knowledge of.

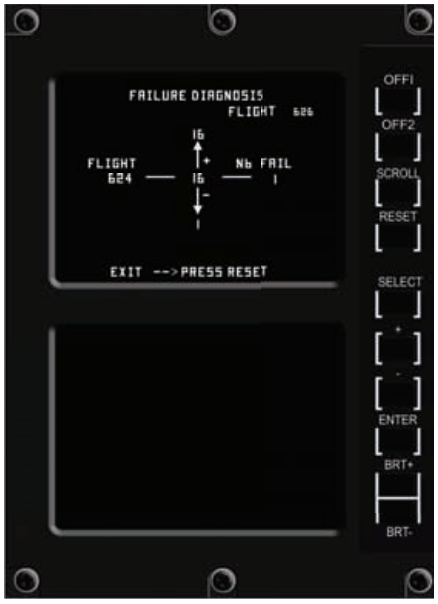
The Configure Page allows the user a method of changing the unit systems displayed on the screens. The Maintenance Pages (limited to

VEMD Configure Page.

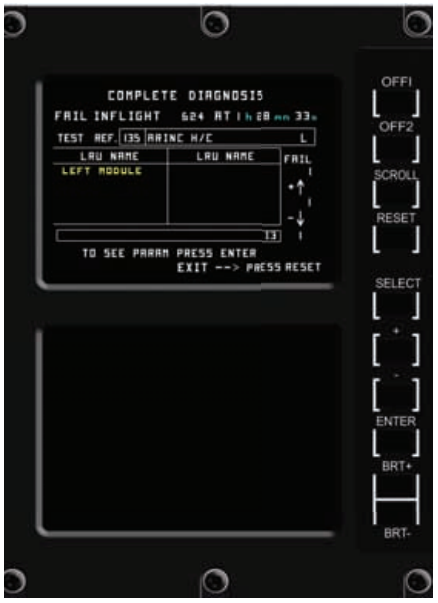


VEMD Maintenance Page.

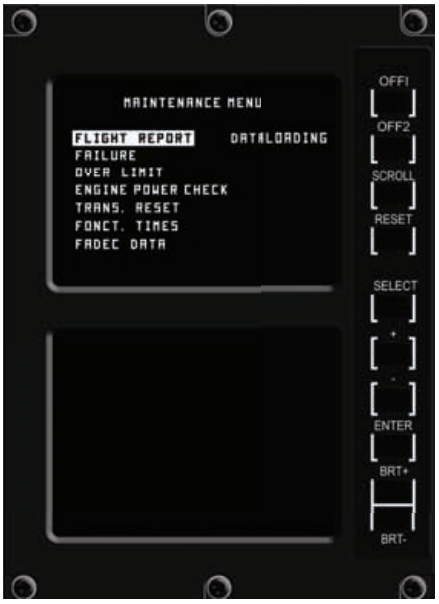
VEMD Flight Reports.



VEMD Failure Menu.



VEMD Failures for Each Flight.



Overlimits for Last 31 Flights.

the pages utilized by the pilot) allow the pilot to reference flight reports, failures, over-limits and power check results.

As I stated earlier, these pages can only be referenced when the engine is shut down. The first step in accessing these pages is to shut off both screens (OFF1 and OFF2 buttons). To access the Configure Page, both screens are turned back on (simultaneously) and then the SELECT and ENTER buttons are depressed and held until the screens display RELEASE KEY. An alternate method to access the page is to depress the SELECT and ENTER keys when turning on the BAT EPU pushbutton on the center console. A menu list of changeable items is then displayed.

A highlighted field (solid white box) is placed over the item that can be altered. Depressing the "+" or "-" buttons will change the item. Depressing the SELECT button will move the highlighted field to the next line.

The STARTER GENERATOR, FLOWMETER and GPS items would only be changed if maintenance were making a change to the airframe. However, if these items are changed, it is common for maintenance personnel to ask the pilot to change the parameter. The options are installed (I) or not installed (N/I).

The other items on the menu list are fields that are commonly changed if other pilots operating the helicopter prefer different forms or measurement.

The SLING field has two options – either installed (I) or not installed (N/I). If "installed" is chosen, a line will appear on the Performance Page that gives the pilot an area to enter a weight value of the load.

The UNIT SYSTEM field gives the pilot the ability to utilize either the metric (IS) or the imperial forms of measurement. For pilots in most of the world, this doesn't seem like a hard choice. But for pilots operating in the United States or who may spend part of their time flying in the US, this is

SIZE DOES MATTER

MX-20HD MX-15HDi MX-15Di M12-650 MX-10

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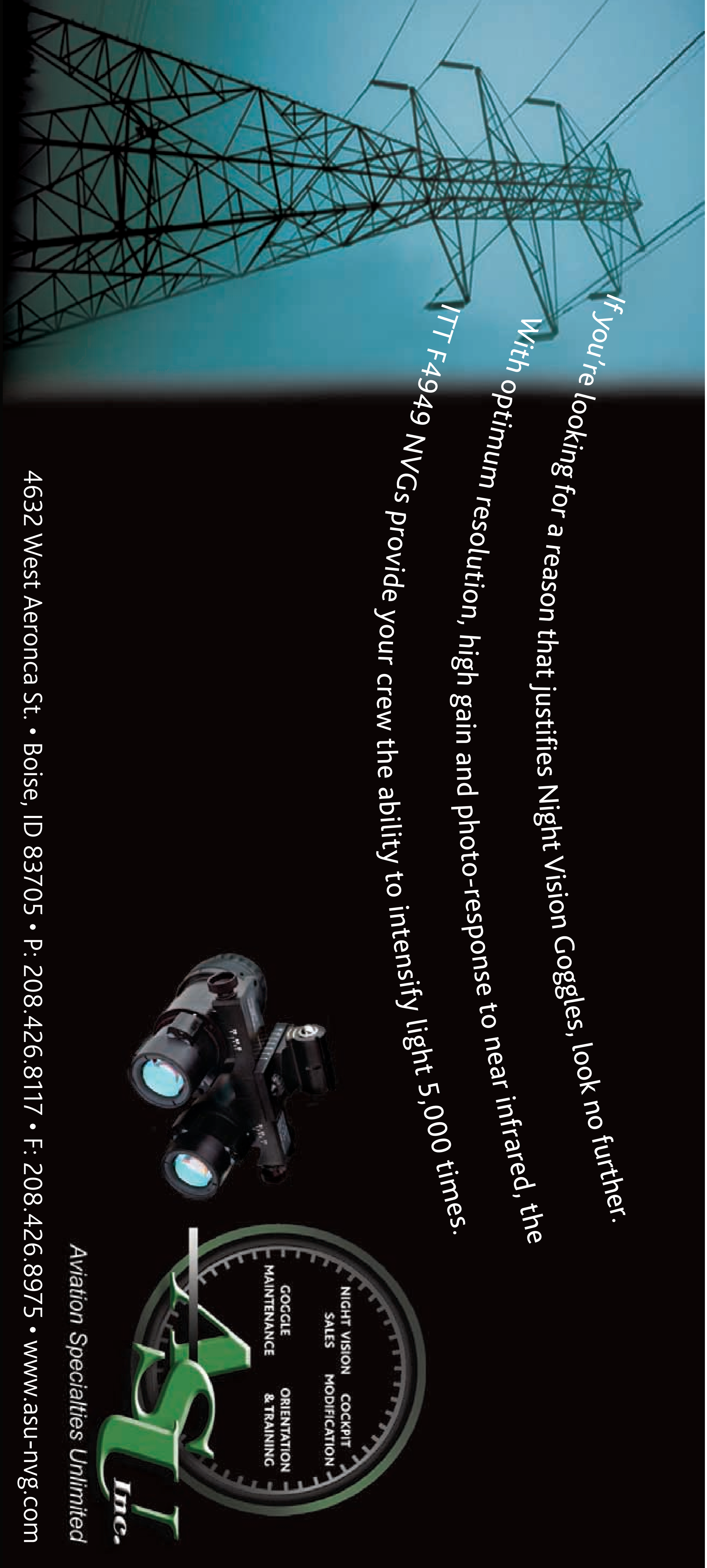
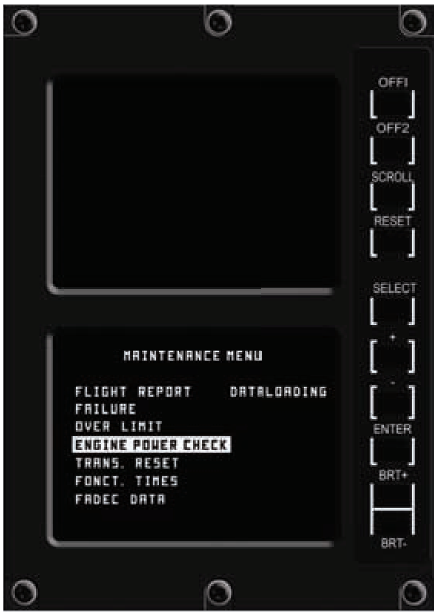
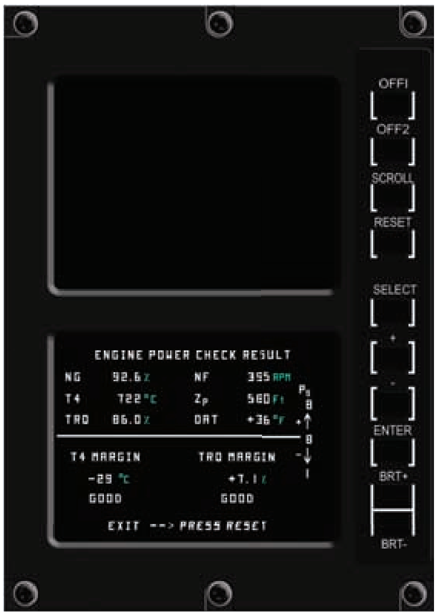




Maintenance Menu to Reference Engine Power Checks.



Engine Power Checks.

a field that often needs to be altered depending on the mission.

If the IMPERIAL unit of measurement is used, displayed OAT will be in Fahrenheit, the oil pressure gauge will be in psi and the performance page will be in pounds. This unit choice could also affect the fuel quantity and flow displays. If the metric (IS) unit of display is used, OAT will be displayed in Centigrade, the oil pressure gauge will be in bars and the performance page will be in kilograms.

The ALTITUDE UNIT field gives the pilot the ability to choose either Feet or Meters for the unit displays that reference altitude.

The FUEL UNIT is one of the most-altered display fields. Depending on personal preference, pilots either use a weight value or quantity value. This field will affect the quantity display and the fuel flow displays. The field allows the user to choose kilograms (if IS is used for the UNIT SYSTEM), pounds (if IMPERIAL is used for the UNIT SYSTEM), liters, US gallons or imperial gallons.

Once changes are made to the options, and the pilot wants to "save" these changes, the highlighted field is placed over VALID and the ENTER key is depressed. To exit the Configure Page the screens are turned off then back on (OFF1 and OFF2).

The Maintenance Pages are used to access the last or previous flight reports to complete flight logs or to ensure that previous flights did not experience any failures or over-limits. This is particularly useful if flying a helicopter for the first time. If a pilot were to exceed a limitation on the engine and did not report it, he or she might try to "get away with it" knowing that after 31 starts, the exceedence will be purged from the report. This can put subsequent pilots in an unsafe airframe.

To access the maintenance pages, both screens are turned off by depressing the OFF1 and OFF2 buttons. Both screens are then turned back on (simultaneously) and the SCROLL and RESET buttons are depressed and held until the screens display RELEASE KEY. An alternate method to access the pages is to depress the SCROLL and RESET keys when turning on the BAT EPU pushbutton on the center console. The maintenance menu is then displayed.

The line items that are used by pilots are FLIGHT REPORT, FAILURE, OVERLIMIT and ENGINE POWER CHECK. The highlighted field is shown over the menu item that can be accessed. To access the menu item, the ENTER button is depressed. To move the highlighted field to the next line, the SELECT button is depressed.

The FLIGHT REPORT pages display the last 31 flights. For each of the last 31 flights, the flight number, duration (time engine is running), engine cycles (including total cycles), notification of any failures that occurred during the flight and any over-limits that occurred during the flight are displayed. To return to the main maintenance menu page, the RESET button is depressed.

The FAILURE menu displays any faults that occurred on items that the VEMD is monitoring. The majority of the items are VEMD, FADEC or sensor components. The unit can record and display up to 256 failures. On the surface, the FAILURE pages can appear somewhat cryptic, but once understood they are very basic.

The first of the FAILURE pages gives the pilot the ability to choose the flight on which the failure occurred. On the example shown, the last flight that had a failure was flight 624. If you look in the upper right hand corner, 625 will be the next flight number. For this aircraft, there have been 16 flights with failures. The pilot can scroll through the 16 flights by depressing the "+" or "-" button. On flight 624, there was one failure (Nb FAIL) during the flight. To find out what the failure was and when in flight it occurred, the ENTER button is depressed. To return to the main maintenance menu page, the RESET button is depressed.

The OVERLIMIT pages will display any exceedences that occurred during the last 31 flights. Each of the last 31 flights can be scrolled through by depressing the "+" or "-" button. If no exceedences occurred during a flight, all displayed items will read "0". If an exceedence occurred, values will appear displaying the length in time and values achieved during the exceedence. To return to the main maintenance menu page, the RESET button is depressed.

The ENGINE POWER CHECK results page displays that last eight power checks. This gives the pilot the ability to perform the check in flight without having to write down the numbers while flying. Accessing the power check results page is different from the other maintenance page items. If the highlighted field is placed over the ENGINE POWER CHECK line item and ENTER is depressed, a message will appear stating "MODE NOT AVAILABLE CHECK LANE 2".

To access the engine power check results pages, starting from triple pack display, both lanes are turned off. Then, only lane 2 is turned back on, after which SCROLL and RESET are depressed and held until the RELEASE KEY message appears on the bottom display only. The maintenance menu is then displayed on only the lower screen. Only the ENGINE POWER CHECK line item is used when accessing the menu on the lower screen.

To place the highlighted field over the ENGINE POWER CHECK line item, the SELECT button is depressed three times. Once the highlighted field is over ENGINE POWER CHECK line item, the ENTER button is depressed and the last eight engine power check results are displayed. To exit the Maintenance Pages, both screens are turned off then back on.

Again, as I stated in the last issue, this brief discussion of the VEMD flight pages is a mere overview of the system and its operation. To utilize the display and have a thorough and useful knowledge of it as a tool in your aircraft requires a much more in-depth study. This information cannot be absorbed and retained by simply reading this text. To achieve a better understanding of the unit, take this issue and the last issue of *HeliOps* to your airframe. Plug in an external power source and start pushing buttons. You will be amazed at how quickly the veil of confusion will fade away as you explore the screens of the VEMD. ■