FLIGHT DECK SOFT

ADVANCED AVIONICS SUITE

JET45

HANDBOOK AND USER GUIDE

TABLE OF CONTENT   SECTION-PAGE

UPDATES-REVISIONS-NOTAMS

The U-R-N page is an advisory for users of JET45 AAS to advise of any Software Updates, list out User Manual Revisions, and other import Notices To Airmen.

SOFTWARE UPDATES-

(Effective June 01 2012)

RMU UPDATES

Implemented TCAS altitude band and manual/auto display mode with sync between both RMUs of altitude band mode, range, and auto/manual mode and its operation with the MFD

Single ADF now per aircraft

Implemented COM/NAV memory storage per manual

Fixed truncation causing freezing of decimal digits during tuning

Implemented "cross side" sync between transponder squawk codes

Fixed transponder tuning

Added user display positioning and zoom while in bezel-less mode:

 • Remove Bezel (right click)

 • Move graphics (A,D,W,X) while in bezel-less mode

 • Scale graphics (Q,E) while in bezel-less mode

RMU Dimming implemented

Integrated transponder with Squawkbox software

PFD UPDATES

Added offset for RA/BARO button.

Low Speed Awareness mode implemented on PFD Airspeed Scale

Low Speed Trend vector implemented

Overspeed Warning Modes corrected and enhanced- Now shows Overspeed Warning for both KIAS and Mach at Vmo and Mmo.

Overspeed Warning Trend added.

Airspeed Trend vector disabled on ground per P1000 System

Automatic swap over from Mach to KIAS when airspeed drops below 238 KIAS

V-Speeds show only when displaying KIAS

CDI Auto tune when in FMS nav mode implemented

Corrected displaying of FMS source to show as "FMS" vs. "FMS1"

Altitude Tape now shows scale beyond FL500

Radar Altimeter now shows corrected AGL height of "0" feet when on ground

Improved window frame toggle handling

THIS SPACE INTENTIONALLY LEFT BLANK

MFD UPDATES

Added TCAS altitude display mode to TCAS display

TCAS Manual/Auto Mode Added

Fixed altitude mode reporting

MFD will convert all plan names to uppercase and limit length of displayed name.

Proper Display of up to 8 Airports and Navaid Limits per real P1000 System- up to four of each type (Airport, VOR, NDB)

SAT now shows correct temperature

Implementation of a new scrolling function for Flight Plan names

 User can now display up to 50 plans from the target folder

Engine Shutdown/Collector Messages Updated

MCR Logic Updated to allow acknowledgment of messages

DU 2/3 Reversion performance fixed

Voltage/Amperage Display Updated

Entry Door CAS Added

MFD "CHECK EICAS" message when generated

"FMS" added to MFD when nav source set to FMS in addition to waypoint Distance and Time Remaining

Spoiler indication Fix to indicate deflection for both L and R sides

THIS SPACE INTENTIONALLY LEFT BLANK

USER MANUAL REVISIONS-

Updated new features for the entire JET45 suite

NOTAMs-

EACH TIME MSFS IS STARTED, IT IS HIGHLY RECCOMMENDED TO LOAD THE DEFAULT LJ45 FIRST IF YOU ARE USING THE FRIENDLY PANELS LJ45 PANEL SET.

THIS SPACE INTENTIONALLY LEFT BLANK

I.

CONDITIONS OF USE AND END USER AGREEMENT

THE USE OF THIS SOFTWARE PACKAGE (**JET45** AVIONICS SUITE) IS CONTINGENT UPON THE FOLLOWING CONDITIONS OF USE:

THE USER SHALL NOT USE THIS SOFTWARE OR MANUAL AS A REFERENCE TO REAL-WORLD AVIATION OR CERTIFICATION PURPOSES. THE USER AGREES TO THE END USER LICENCE AGREEMENT CONTAINED WITHIN THE SOFTWARE PACKAGE. THE USER UNDERSTANDS THAT THE PACKAGE MAY BE UPDATED OR ALTERED AT ANY TIME. THE USER UNDERSTANDS THAT NO GUARANTEE IS GIVEN AS TO THE ACCURACY OR COMPLETION OF THE PACKAGE IN REGARDS TO THE SOFTWARE AND SYSTEMS THAT IT SIMULATES. THE USER UNDERSTANDS THAT ANY REFERENCE MADE TO 'AIRCRAFT' IN THIS USER GUIDE/MANUAL IMPLIES 'SIMULATION OR SIMULATED' AIRCRAFT UNLESS OTHERWISE NOTED AS A REFERENCE TO THE REAL-WORLD AIRCRAFT.

END USER AGREEMENT AND DISCLOSURE

THIS SOFTWARE USE AGREEMENT ("AGREEMENT") GOVERNS YOUR DOWNLOAD, INSTALLATION, AND USE OF THE SOFTWARE PROGRAM KNOWN AS JET45 ADVANCED AVIONICS SOFTWARE. THE JET45 ADVANCED AVIONICS SOFTWARE IS PRODUCED BY FLIGHTDECKSOFT.COM.

PLEASE READ THIS AGREEMENT CAREFULLY AND MAKE SURE THAT YOU FULLY UNDERSTAND IT. YOU WILL HAVE THE OPPORTUNITY TO ACCEPT OR REJECT THE TERMS OF THIS AGREEMENT DURING THE INSTALLATION PROCESS. YOU MAY NOT DOWNLOAD, INSTALL OR USE THE JET45 ADVANCED AVIONICS SOFTWARE UNLESS YOU AGREE TO THE TERMS OF THIS AGREEMENT DURING THE INSTALLATION PROCESS.

IF YOU ACCEPT THE TERMS OF THIS AGREEMENT AND DOWNLOAD AND INSTALL THE JET45 ADVANCED AVIONICS SOFTWARE, YOU WILL ALWAYS HAVE THE OPTION TO UNINSTALL THE JET45 ADVANCED AVIONICS SOFTWARE AT ANY TIME BY USING THE STANDARD "ADD/REMOVE PROGRAMS" FUNCTION PROVIDED IN THE WINDOWS OPERATING SYSTEM.

THIS AGREEMENT MAY BE MODIFIED FROM TIME TO TIME BY FLIGHTDECKSOFT.COM, IN ITS SOLE DISCRETION. UPON ANY SUCH MODIFICATION, THE MODIFIED AGREEMENT MAY BE POSTED AT THE WEB SITE LOCATED AT WWW.FLIGHTDECKSOFT.COM FOR YOUR REVIEW. UPON ANY MODIFICATION TO THE AGREEMENT, YOUR CONTINUED USE OF THE JET45 ADVANCED AVIONICS SOFTWARE WILL BE GOVERNED BY THE MODIFIED AGREEMENT AND WILL BE DEEMED TO BE AN ACCEPTANCE OF THE MODIFIED AGREEMENT, WHICH FOR ALL PURPOSES SET FORTH HEREIN SHALL BE DEEMED THE AGREEMENT. IF, FOR ANY REASON, YOU DO NOT AGREE TO BE BOUND BY ANY OF THE MODIFICATIONS, YOU MAY NOT CONTINUE TO USE THE JET45 ADVANCED AVIONICS SOFTWARE. THE JET45 ADVANCED AVIONICS SOFTWARE MAY ALSO BE MODIFIED, UPDATED, ENHANCED OR UPGRADED FROM TIME TO TIME AT FLIGHTDECKSOFT.COM'S DISCRETION. FOR PURPOSES OF THIS AGREEMENT, ANY SUCH MODIFIED, UPDATED, ENHANCED OR UPGRADED JET45 ADVANCED AVIONICS SOFTWARE SHALL ALSO BE REFERRED TO AS THE JET45 ADVANCED AVIONICS SOFTWARE.

If you have any questions or comments regarding this Agreement or the JET45 ADVANCED AVIONICS Software, please email us at info@flightdecksoft.com.

1. Authorized Users.
The Jet45 Advanced Avionics Suite Software may only be installed or used by (i) the owner of the computer where the Jet45 Advanced Avionics Suite Software is installed (the "Authorized Computer"), and (ii) any persons authorized by the owner of the Authorized Computer to use the Authorized Computer and to install the Jet45 Advanced Avionics Suite Software in accordance with the terms of this Agreement, provided that the individuals referred to in (i) and (ii)

above have read this Agreement and agree to abide by it (x) before any such installation and (y) at all times while using the Jet45 Advanced Avionics Suite Software (collectively, the "Authorized Users," and each an "Authorized User"). Any references to the pronouns "you" and "your" anywhere in this Agreement are intended to refer to any one or to all Authorized Users of the Jet45 Advanced Avionics Suite Software.

2. Ownership; Limited License Grant.
As between you and Jet45 Advanced Avionics Suite, the following are and shall remain the sole property of Jet45 Advanced Avionics Suite: (a) all right, title and interest in and to the Jet45 Advanced Avionics Suite Software, (b) any intellectual property rights (including, without limitation, any copyrights, patents, trademarks, trade secrets and other rights) in and to the Jet45 Advanced Avionics Suite Software, (c) any Flighdecksoft.com content or services delivered via the Jet45 Advanced Avionics Suite Software, and (d) any intellectual property rights (including, without limitation, any copyrights, patents, trademarks, trade secrets and other rights) in and to such Flightdecksoft.com content or services. Flightdecksoft.com agrees to grant and hereby grants to you a limited, nonexclusive, nontransferable, royalty-free license to download and install the Jet45 Advanced Avionics Suite Software solely for your personal use and subject to the terms and conditions of this Agreement. You may not assign, sublicense or otherwise convey or transfer the rights granted to you under this Agreement to any other person, organization, or entity. Any rights not expressly granted to you hereunder are reserved by Flightdecksoft.com. The limited right granted to you to download, install and use the Jet45 Advanced Avionics Suite Software is a limited license and does not constitute the sale of a software program. You are expressly prohibited from doing the following with or to the Jet45 Advanced Avionics Suite Software: (v) decompiling, reverse engineering, or disassembling it, (w) tampering or interfering with its functionality, delivery or operation while using or installing it, (x) selling, renting, transferring, reselling, or distributing it, (y) duplicating, reproducing, copying, modifying, or otherwise creating derivative works of it, or (z) exporting or re-exporting it, directly or indirectly, into any country prohibited by the United States Export Administration Act or any regulations promulgated thereunder.

3. Privacy.
The information that Flightdecksoft.com collects from you through technical means in connection with your download, installation or use of the Jet45 Advanced Avionics Suite Software will be collected, stored, used and shared by Flightdecksoft.com in accordance with its Software Use Privacy Policy, available at http://flightdecksoft.com. The Jet45 Advanced Avionics Suite Software Use Privacy Policy, as may be modified from time to time in Flighdecksoft.com's sole discretion, is expressly incorporated herein by this reference and made part of this Agreement.

4. Modifications to the Jet45 Advanced Avionics Suite Software or to the Flightdecksoft.com Site; Termination.
Configuration updates to the Jet45 Advanced Avionics Suite Software, which may include text files and/or graphic files only, may be delivered to users automatically. Subject to the other provisions of this Section 5, Flightdecksoft.com shall have the right at any time to disable, enable, modify, or discontinue, temporarily or permanently, the Flightdecksoft.com Site and/or the Jet45 Advanced Avionics Suite Software (or any part thereof), with or without notice, obligation or liability to you or to any third party.

5. Uninstallation.
The Jet45 Advanced Avionics Suite Software may be uninstalled by simply deleting the files and folders containing the Jet45 executables.

6. SUPPORT.
FLIGHTDECKSOFT.COM HAS NO OBLIGATION TO PROVIDE YOU WITH SUPPORT, MAINTENANCE, UPGRADES, MODIFICATIONS, OR NEW RELEASES WITH RESPECT TO THE JET45 ADVANCED AVIONICS SUITE SOFTWARE.

7. DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITY.
BY INSTALLING, DOWNLOADING OR USING THE JET45 ADVANCED AVIONICS SUITE SOFTWARE, YOU HEREBY AND FOREVER WAIVE ANY AND ALL CLAIMS YOU HAVE NOW OR MAY HAVE IN THE FUTURE AGAINST FLIGHTDECKSOFT.COM OR ITS LICENSORS RELATING TO YOUR DOWNLOAD, INSTALLATION OR USE OF THE JET45 ADVANCED AVIONICS SUITE SOFTWARE. YOU HEREBY WAIVE ANY CLAIM THAT THE FOREGOING LIMITATION OF LIABILITY DEPRIVES YOU OF AN ADEQUATE REMEDY. YOUR SOLE REMEDY FOR DISSATISFACTION WITH THE JET45 ADVANCED AVIONICS SUITE SOFTWARE IS TO STOP USING THE JET45 ADVANCED AVIONICS SUITE SOFTWARE. YOU SPECIFICALLY AGREE THAT NEITHER FLIGHDECKSOFT.COM, NOR ITS LICENSORS, SHALL BE LIABLE FOR LOSSES OR LIABILITIES ARISING IN CONNECTION WITH YOUR DOWNLOAD, INSTALLATION OR USE OF THE JET45 ADVANCED AVIONICS SUITE

SOFTWARE, INCLUDING, BUT NOT LIMITED TO, LOSS OR LIABILITY RESULTING OR ARISING FROM OR IN CONNECTION WITH: (A) SOFTWARE CONFLICTS RELATED TO THE JET45 ADVANCED AVIONICS SUITE SOFTWARE; (B) DATA NON-DELIVERY, DATA MIS-DELIVERY OR UNAUTHORIZED ACCESS TO TRANSMISSIONS OF DATA; (C) YOUR INFRINGEMENT OF A THIRD PARTY'S RIGHT; (D) DEFECTS OR VIRUSES IN, OR DISTRIBUTED WITH, THE JET45 ADVANCED AVIONICS SUITE SOFTWARE; OR (E) YOUR OWN USE OR MISUSE OF YOUR PERSONAL COMPUTER OR THE SOFTWARE APPLICATIONS CONTAINED ON YOUR PERSONAL COMPUTER. WITHOUT LIMITING THE FOREGOING, FLIGHTDECKSOFT.COM SHALL NOT BE LIABLE TO YOU FOR ANY ACTUAL, DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, OR PUNITIVE DAMAGES OR LOST OR IMPUTED PROFITS OR ROYALTIES ARISING OUT OF OR RELATING IN ANY WAY TO THE JET45 ADVANCED AVIONICS SUITE SOFTWARE OR THIS AGREEMENT, IRRESPECTIVE OF WHETHER FLIGHTDECKSOFT.COM WAS ADVISED, KNEW OR SHOULD HAVE KNOWN OF THE POSSIBILITY OF ANY SUCH LOSS OR DAMAGE. THE JET45 ADVANCED AVIONICS SUITE SOFTWARE IS PROVIDED "AS IS" AND "AS AVAILABLE" WITH NO TECHNICAL SUPPORT OR REPRESENTATIONS OR WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, BY STATUTE OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, SYSTEM INTEGRATION, TITLE, AND NON-INFRINGEMENT AND ANY WARRANTIES THAT MAY ARISE OUT OF COURSE OF PERFORMANCE, COURSE OF DEALING OR USAGE OF TRADE.

8. Indemnification.
You hereby agree to release, indemnify, defend and hold harmless Flightdecksoft.com, its parents, shareholders, subsidiaries, affiliates, officers, directors, employees, agents and advisors, from and against any and all losses, liabilities, claims (including claims without legal merit or brought in bad faith), demands, damages, costs or expenses, causes of action, suits, proceedings, judgments, awards, executions and liens, including reasonable attorneys' fees and costs (whether brought by third parties or otherwise) relating to or arising from your use, installation or download of the Jet45 Advanced Avionics Suite Software or your breach of this Agreement. Flightdecksoft.com reserves the right, at its own expense, to assume the exclusive defense and control of any matter otherwise subject to indemnification by you hereunder, and in such event, you shall have no further obligation to provide indemnification for such matter.

9. Notice to End Users.
The users of Jet45 Advanced Avionics Suite agree that the Jet45 Advanced Avionics Suite shall not be used as a reference or analog for training in connection with real world aviation or certification purposes. The user also agrees that at no time shall Jet45 Advanced Avionics Suite be used for commercial purposes without the expressed written consent and proper licensing by Flightdecksoft.com. The user agrees that no guarantee is given as to the accuracy or completion of the package in regards to Jet45 Advanced Avionics Suite. The user understands that any reference to "AIRCRAFT" in the software or user manual implies "SIMULATION OR SIMULATED" aircraft unless otherwise noted as reference to the real-world aircraft.

10. General Provisions.
This Agreement shall be governed exclusively by, and construed in accordance with United States federal laws and the laws of the State of California, without reference to any conflict of laws principles. This Agreement will not be governed by the United Nations Convention on Contracts for the International Sale of Goods, the application of which is hereby expressly excluded. The exclusive forum for any disputes arising out of or relating to this Agreement shall be an appropriate federal or state court in San Diego County, California and the parties hereby expressly waive all venue, jurisdiction and choice of law challenges or defenses. If any part of this Agreement is determined by a court of competent jurisdiction to be invalid or unenforceable, including, but not limited to, any of the warranty disclaimers or liability limitations set forth above, then the invalid or unenforceable provision will be deemed superseded by a valid, enforceable provision that most closely matches the intent of the original provision and the remainder of the Agreement shall continue in full force and effect. If no enforceable provision can be substituted for any such invalid or unenforceable provision, then that provision shall be deemed severable from the Agreement and shall not affect the validity and enforceability of any remaining provisions in this Agreement. This Agreement will be binding upon and will inure to the benefit of Flightdecksoft.com and its successors and assigns.

BY AGREEING TO THE TERMS OF THIS AGREEMENT, YOU ACKNOWLEDGE THAT (1) YOU HAVE READ AND REVIEWED THIS AGREEMENT IN ITS ENTIRETY, (2) YOU AGREE TO BE BOUND BY THE TERMS OF THIS AGREEMENT, AND (3) YOUR OBLIGATIONS UNDER THIS AGREEMENT ARE BINDING AND ENFORCEABLE.

COMMERCIAL USE IS PROHIBITED UNLESS A COMMERCIAL LICENSE OR PERMISSION HAS BEEN GRANTED BY THE AUTHOR.

INTRODUCTION

Welcome to the Flight Deck Soft **JET45** Advanced Avionics Suite. This software is intended for use with Microsoft FS2004, FSX as well as Lockheed Martin's PREPARED software and provides the user with a comprehensive avionics solution for those building aircraft that use the style of avionics suite that is used in the Learjet 45. While the software does not claim to be a complete representation of the real-world counterpart of the avionics it is modeled after, it gives the user the ability to operate their simulation in a very realistic manner by way of an authentic appearance and a deep level of system modeling. Throughout the manual the user will find helpful information that goes beyond the use of **JET45** AAS but that also guides the user in the use of the software alongside the operation of the aircraft. However, it should also be noted that this package would make a great substitute avionics suite for other similarly-equipped aircraft as well.

While not a must, the user may find that having real-world handbooks and checklists of the aircraft used with this software a handy companion to guide the user through the proper operation techniques. Development of the **JET45** suite is on-going and the user should note that while there may be mention of certain components of the package mentioned here, that not all of the components have been development for release at this time nor is there any guarantee that the package will ever be 100% 'completed' compared to the real-world counterpart.

It is recommended that the user pay close attention to the guidelines and notes outlined in this User Guide in order to get the best performance out of the package.

•Items that are of utmost importance will be noted in **RED**.

•Items that are considered helpful the user will be noted in **GREEN**.

•Items that are considered for development but not yet available are in **PURPLE**.

INSTALLATION REQUIREMENTS AND SETUP

It is possible for this software package to be run on the local machine that runs FS or to be run over a network of multiple PCs. However please note that the testing of this software reveals that to get optimum performance out of the package you should run the components over a network. **The user should run the software first before purchasing to determine if it will perform satisfactorily.**

It is recommended that the user install this package on a client machine with the following minimum specifications:

Pentium IV or AMD based CPU of 1.8 GHz+/ 512 MB+ RAM/ 256 MB+ Video Memory. It should be noted that the best performance for this software will be gained by having the best video card available on the machine you run the software from, as the software is GPU performance based rather than CPU-based.

1) FSUIPC is required to be installed on the Server machine and **Wide Client** is to be installed and running on each Client machine that is to run any software component in this package. Without Wide Client installed and configured properly, this software will not work on a client.

2) Microsoft **.NET 3.5 Framework** is required for this package to run. You can download and install this free package from Microsoft.

3) Setup *Folder Sharing* on your MSFS flight plan folder on each client machine that needs to have the ability to depict your flight plan, such as the MFD. You may have to have Administrator Privileges in order to set up folder sharing. To enable Folder Sharing from the Server:

> Navigate to the **Flight Simulator Files** located in My Documents
>
> Right-click on the folder and select **Properties**
>
> Check the box that says '**Sharing**' and enable the file to be shared across your network.

INSTALLATION REQUIREMENTS AND SETUP cont.

4) Microsoft **Flight Simulator 2004 (FS9), FSX** or Lockheed Martin's **PREPAR3D** is required for this package to run in its entirety. You can run this package using either simulator, however you must create two separate installations of this package in order for it work properly with both simulators due to file sharing required for flight plan route depiction on the MFD/NAV display and the PFD's HSI while in arc mode.

5) Once the software is purchased through the Flight1 Software wrapper, the wrapper will then copy the zip file to a directory of your choosing. Once copied, the folder may be unzipped to a location of your choosing and the software will then be ready for use. If installing on multiple PCs, DO NOT copy the unzipped folders to other PCs as this can corrupt the licensing scheme and lead to undesirable results including prevention of the running of the software. It is strongly suggested that you use the original Flight1 Software wrapped version to install on multiple PCs, This preserves the licensing scheme and will result in a more robust installation. Please note that there is no limit on the number of times or PCs that the software can be installed.

6) To install the **JET45** Avionics Suite, simply unzip the zip file to the destination of your choice on your PC or Client PC. Depending on which component you are installing, make sure that you set the .INI files to the preferences that meet your requirements. Each component has different .INI files that may be required to be set differently depending on your application of the software so be sure to read the Component-Specific installation instructions that are included in the section belonging to that component (PFD, MFD, etc.). Once you have installed and configured your software and .INI file, the software can be run at any time but will not show any activity until FS is detected across the network.

FONTS: Please notice the font file that is included within the zip file. Simply place the font file within the Windows' Fonts folder (typically located at **C:\WINDOWS\Fonts**). Starting the software without the font installed will cause each component to shutdown.

Additional .INI Configuration Details

Follow the example below to have a better understanding of the .ini file structure and settings.

[X_SIZE,Y_SIZE]
460,643
[X_POSITION,Y_POSISTION]
121,22
[FRAMELESS_WINDOW(0-1)]
0
[DISPLAY_BEZEL(0-1)]
1
[I_AM_DU2(0-1)]
1
[PLAN_PATH]
"\\FSServer\FSplans
[PATH_TO_DU2]
"C:\Jet45\Jet45 MFD\"
[PATH_TO_DU3]
"\\Client2\Jet45\Jet45 MFD\"

[X_SIZE,Y_SIZE]
460,643
[X_POSITION,Y_POSISTION]
121,22

The two areas above should be left alone. This is set each time you close your component window. If you resize the component, it will then stay the same size and position you left it in.

[FRAMELESS_WINDOW(0-1)]
0

This takes away the Windows border. 0 means 'not frameless' and 1 means 'frameless'. You can also hit the F key while the software is running to remove the window frame. This is recorded in the ini file so that when restarted the window frame will be off.

[DISPLAY_BEZEL(0-1)]
1

This turns the bezel artwork off and on. 0 means off, 1 means on.

INSTALLATION REQUIREMENTS AND SETUP cont.

[I_AM_DU2(0-1)]
1

If set to 0, this designates this component as the MFD which is DU3.
If set to 1, this designates this component as the EICAS which is DU2.

[PLAN_PATH]
"\\FSServer\FSplans"

This tells the MFD where FS stores the flight plans. Change to suit your configuration. In this case, \\FSServer\FSPlans is a shared drive on the FS PC.

[PATH_TO_DU2]
"C:\Jet45\Jet45 MFD\"

This tells the MFD where DU2 is running. In this case it is on the same PC that this ini file is in. If [I_AM_DU2(0-1)] is set to 1, that means this ini file belongs to DU2 and this path should be the same as the path to this ini file.

[PATH_TO_DU3]
"\\Client2\Jet45\Jet45 MFD\"

This tells the MFD where the other MFD is installed. In this case it is on a PC named Client2 in a shared folder called Jet45 MFD.

Pay very close attention here to where your path is for the components. As you are likely (and recommended) to run all of these on your network.

You MUST insure that the path in EACH and EVERY .ini file is corrected to your own installation.
Also be certain to leave the " " marks as they are required.

INSTALLATION REQUIREMENTS AND SETUP cont.

Notice that in your install file, you will get 4 folders named JET45 EFIS, PFD, MFD, RMU.

As pointed out above, the MFD is the EICAS depending on which option is set in your .ini file. Simply make two installations of the MFD and designate in the .ini file which mode you want that component to run as. Once you set it to 0 or 1, then save the file and open the component. Size the component to where you want it ran and then when you reopen it later it will be in the same location.

Since you must have two installations of the MFD component, it may be helpful to name your EICAS folder either JET45 EICAS or DU2, and the MFD/ND folder MFD or DU3 to help yourself keep it straight.

The exact same thing is required of the RMU since you have RMU1 and RMU2. Simply copy the RMU folder and place it in another location and rename them RMU1 and RMU2. Then go into the .ini file of each RMU component and set the option for whichever RMU it is.

All of this is necessary to provide the most realistic Learjet style avionics package available today, most notably the DU reversion feature between DU2 and DU3.

7) The **JET45** Avionics Suite demo is geographically limited to a 60NM radius from Wichita KICT airport. When the user flies outside of this range, the software will alert the user that it is in demo mode and shut down. The user will have to remain within the 60 NM range for the software to continue working.

8) The **JET45** displays will be actively showing (demo mode) until WideFS sends the signal that MSFS is running unless your default flight is setup with the Battery ON.

9) The **JET45** graphics may appear blocky until you adjust your video card to a high quality setting for anti aliasing.

NOTE: .INI File options are typically values of "0" for **OFF** or **NO** and "1" for **ON** or **YES**

NOTE: .INI File options must be closely paid attention to or the software will not sync up with itself or with FS9/FSX. See each specific .ini file example under each component section.

NOTE: Zero Values are shown in some illustrations due to no FS running during screen capture.

COMPONENT OVERVIEW

| PFD/DU1 | EICAS/DU2 | EFIS 1 | EFIS 2 | MFD/DU3 | PFD/DU4 |

RMU1   RMU2

PRIMARY FLIGHT DISPLAYS

The Flight Deck Soft **JET45** Advanced Avionics Suite provides a realistic representation of the Primary Flight Displays (PFD) found in the LJ40/45. The Primary Flight Displays typically are displayed on the outboard Display Units 1 and 4. See the Main Instrument Panel illustration in Appendix A.

Main Features:

- Primary flight data information

- Comprehensive EFIS integration with bearing source selectors as well as navigation source annunciation.

- Flight Guidance Modes currently selected (Autopilot Modes) NAV/FMS/APP/LOC

- Flight Director status tied to FGC

- Selectable Arc or Compass HSI Modes via EFIS Display Controller with FP Route mapping in Arc Mode.

- Low speed and Over-speed Trending/Awareness on Speed Tape

- Flap Schedule Limits on Speed Tape

- Attractive Display Unit bezel artwork for users without dedicated hardware

THIS SPACE INTENTIONALLY LEFT BLANK

Configuration of the .INI file

To navigate to the PFD .INI simply use Windows Explorer to find the .INI file that is embedded in the Component folder and click on it to open in Note pad. Make sure that Word Wrap is ON in Note pad.

The .INI file offers the user the option to display the bitmap bezel or to turn it off.

NOTE: .INI File options are typically values of "0" for **OFF** or **No** and "1" for **ON** or **YES**

NOTE: Be sure to set [PFD1=0,PFD2=1] to the proper value for the desired side of operation. The Pilot side uses a value of **0** and the Copilot side uses a value of **1**.

NOTE: Pay special attention to:

[PATH_TO_DU2]

"H:\Software\FDS.com**JET45_**MFD"

[PATH_TO_DU3]

"H:\Software\FDS.com**JET45_**MFD"

Both MUST point to the location of that component's installation paths. Simply replace the above path with your own installation path.

THIS SPACE INTENTIONALLY LEFT BLANK

PRIMARY FLIGHT DISPLAYS cont.

PFD DESCRIPTION

The PFD is used to provide Attitude, Altitude, Airspeed, Navigational, and other air data information as well such as Autopilot/FD Modes. The PFD is located on DU 1 and DU4.

Display Frame

The PFD display frame is adjustable by grabbing a corner with your mouse and moving to the desired size. <u>After the software is closed and then restarted the software will remember the last location and size.</u>

Bezel Controllers


MINIMUMS Rotary Encoder-

The MINIMUMS rotary encoder adjusts the altitude alert for minimum altitude decent notification. The value is displayed in the lower right corner of the ADI and is also marked on the Altitude tape as a **D**-shaped bug. When the aircraft has descended to or below the pre-selected minimums **MIN** is displayed on the ADI.

MINIMUMS D-BUG ON ALTITUDE TAPE

MINIMUMS ADVISORY ON ADI
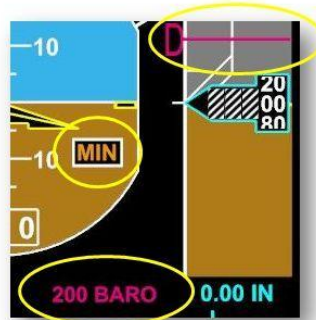
MINIMUMS NUMERICAL ANNUCIATION

MINIMUMS BEZEL CONTROLLER

PAGE 4-4

PRIMARY FLIGHT DISPLAYS cont.

RA/BARO-

Switches between Radar Altimeter and Barometric Pressure

STD-

Sets the altimeter to standard pressure, 29.92" (In) or 1013 millibars (hPa) depending on the setting selected via the EFIS display controller. DU1 and DU4 can display the altimeter setting separately. For the time being, simply use the default offset for setting the standard altimeter setting.

BARO Rotary Encoder-

Sets the altimeter to the required altimeter setting in inches (In) or millibars (hPa) depending on the setting selected via the EFIS display controller.

Display Area Data

ADI-

Attitude Direction Indicator. Provides the current attitude and Direction of the aircraft throughout the flight envelope.

HSI-

Horizontal Situation Indicator. Provides 360 degree compass mode or partial compass (Arc) mode. Arc mode also displays the flight plan route once loaded via the FP key on the MFD. Modes are selected via the EFIS display controller labeled HSI.

Bearing Pointers-

See section 9-1 *EFIS Display Controller* for detailed information on the Bearing Pointers displayed on the PFD.

ALTITUDE TAPE , WINDOW & BUG-

Displays the altitude scale in 100 foot increments. The altitude window shows the current altitude based off of MSL (Mean Sea Level). The altitude tape will show the aircraft's current selected Minimum Altitude if selected via the Minimums rotary selector. The **magenta** altitude select bug is set via the ALT select rotary encoder on the FGC.

AIRSPEED TAPE, WINDOW & BUG-

Displays the airspeed scale in 10 knot increments. The airspeed window shows the current airspeed as a digital readout as a rolling value with 1 knot increments. The minimum airspeed displayed is 40 KIAS (Knots Indicated Airspeed). At or below 40 KIAS the value will remain at 40. The airspeed will be displayed in KIAS until the aircraft reaches .41 mach at which point the window will display the airspeed as a mach value. When the airspeed window is replaced with mach the On-Ground speed zone below the airspeed tape automatically shows KIAS. The **magenta** airspeed select bug is set via the SPD rotary encoder on the FGC. See FGC for additional information regarding SPD Hold.

V Speeds

V Speeds can be manually calculated and entered via the **SPD** function key on the MFD and then transferred to be displayed on the speed tape on the PFD.
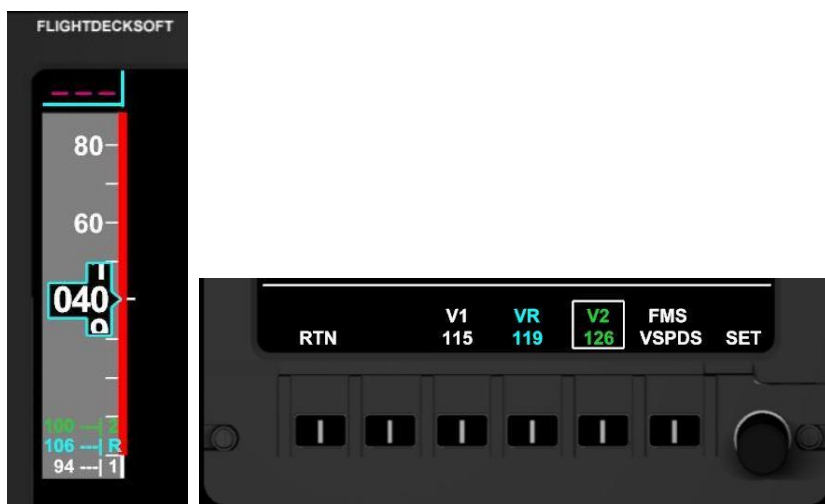
V Speeds will only be displayed when displaying airspeed in KIAS.

ON-Ground speed zone (User Optional via the .ini)-

Displays the current ground speed. Converts to mach values once in the air.

PAGE 4-6

VERTICAL SPEED TAPE , WINDOW & BUG-

Analogue arch displays the vertical speed scale 500 foot increments for both positive and negative rates of climb. Digital scale within the arch displays at 100 foot increments. The **magenta** vertical speed select bug is set via the SPF select rotary encoder on the FGC. See FGC for additional information regarding VS.

FLIGHT DIRECTOR (FD)-

The FD provides flight guidance cues to the crew and commands the autopilot including pitch and roll. Pressing the FD button on the Flight Guidance Controller (FGC) will cause the FD to be annunciated in the form of an **magenta** inverted V on the ADI. **JET45 AAS** models FD priority and is symbolized by a **green** arrow located in the center of the FGC modes annunciation area above the ADI. By default the left (pilot) FD is the active or *Master* FD. FD priority can be determined by the direction of the arrow. The direction of the arrow indicates the Master side and the opposite side indicates the Copy side. Pressing the XFR button on the FGC swaps the side that is Master to the opposite side. Once transferred, the FD priority then uses the navigation sources from the EFIS controller on the side that it is pointing to while in NAV Hold mode. See the FSUIPC offset listing for the custom XFR offset.

THIS SPACE INTENTIONALLY LEFT BLANK

PRIMARY FLIGHT DISPLAYS cont.

FD/FGC MODE ANNUNCIATION-

ALT/VS, APP/LOC, FMS/NAV/HDG, YD is displayed above the ADI. These annunciations change according to the mode selected via the Flight Guidance Controller.

Modes of Operation

FGC MODES-

Currently selected Flight Guidance Controller modes are annunciated above the ADI as well as Flight Director side status. Modes include **AP, APP, ALT, HDG, LOC, NAV, VS, YD**. **GS** is annunciated upon capture of an ILS signal and is displayed above the vertical deviation scale.

FGC Mode example: Autopilot is ON and the aircraft is holding at an altitude of 19,000' with ALT hold engaged. FMS is the navigation source selected via the EFIS display controller with NAV1 bearing selector pointing to the CRG waypoint in the preloaded flight plan route. NAV2 is tuned to the CRG VOR. The left pointing green arrow indicates that the captain's Flight Director is the Master side. Yaw Damper is engaged. Notice also that per the green arch on top of the ADI, the BANK LIMIT is on as well.

PAGE 4-8

PRIMARY FLIGHT DISPLAYS cont.

FGC MODES (contd.)

FGC Mode example: Autopilot is ON and the aircraft is in a climbing right turn passing 33,680' for a target altitude of 41,000'; notice that ALT is replaced by VS which indicates that the autopilot is currently in vertical speed mode. Although the navigation source for NAV1 is the FMS, the aircraft is currently in HDG mode. NAV2 is tuned to the SSI VOR and ADF1 tuned to JUK NDB. The left pointing green arrow indicates that the captain's Flight Director is the Master side. Yaw Damper is engaged. Notice also that per the green arch on top of the ADI, the BANK LIMIT is on as well.

PRIMARY FLIGHT DISPLAYS cont.

HSI MODES-

The PFD has two modes of display for the HSI; Compass and Arc.

See HSI Display Data for more information on these two modes.

HSI in ARC Mode

HSI in Compass Mode

THIS SPACE INTENTIONALLY LEFT BLANK

PAGE 4-10

CDI Modes-

The Course Deviation Indicator operates in two modes: NAV and FMS

• NAV   When tracking a VOR or ILS, NAV mode is selected via the EFIS Display Controller and a green CDI is generated atop the compass. Deviation from the localizer or VOR is displayed as movement to the left or right until aligned.

• FMS   When tracking a flight plan, FMS mode is selected via the EFIS Display Controller and a yellow CDI is generated atop the compass. Deviation from the depicted route is displayed as a yellow bar located to the left or right of center and will align when the aircraft is positioned over the route. Once the aircraft passes a waypoint in the route, the CDI will "auto tune" to the next waypoint in the flight plan by indicating the Desired Track (DTK) to the next waypoint in the route.

THIS SPACE INTENTIONALLY LEFT BLANK

PAGE 4-11

PRIMARY FLIGHT DISPLAYS cont.

Startup- Cold and Dark Avionics

Upon startup the PFD displays should be dark until Battery Master is applied. Once power is applied the display shows data areas and several **X**'s are shown to remind the crew that the avionics are in a failed state. Locations with **- - -** represent where the Air Data Computer (ADC) provides air data to the display once the Avionics Master switch is on. See Illustration 4-a for an example of the screen without Avionics Master applied.

Illustration 4-a

PAGE 4-12

PFD CREW ALERT SYSTEMS

Excessive Pitch Attitude Advisory

The ADI contains **red** warning chevrons to bring attention to excessive pitch attitudes that guide the crew to lower the nose in an effort to avoid an aerodynamic stall situation.

Low Speed Awareness

The Airspeed Tape features a **red** Low Speed Awareness line that is drawn from the bottom of the airspeed scale up to the stall warning stick shaker speed. If the airspeed trend calculator determines that the aircraft is trending into the Low Speed area, the airspeed digits will turn **amber**. Once the aircraft enters the Low Speed area the airspeed digits will turn **red**.

Overspeed Indicator

The Airspeed Tape features a **red** overspeed awareness line that is drawn from the top of the airspeed scale to the overspeed value. If the airspeed trend calculator determines that the aircraft is trending into the overspeed area, the airspeed digits will turn **amber**. Once the aircraft enters the overspeed area the airspeed digits will turn **red**. The overspeed awareness is also displayed in accordance to the flap limit schedule

Overspeed Trend   Overspeed Awareness

ENGINE INDICATING AND CREW ALERT SYSTEM (EICAS)

The Flight Deck Soft **JET45** Avionics Suite provides a realistic representation of the EICAS found in the LJ40/45. The EICAS is typically displayed on the Display Unit 2 However, the user may elect to swap it with the Multifunction Display and operate it on DU3. DU Reversion has been implemented to allow switching position with DU2.

Main Features:

- All primary Engine, Hydraulic, Electrical and Environmental information

- Control Surface Trim and Current positions (Ailerons, Elevators, Rudder, and Speed Brake/Spoiler)

- Crew Alert System (CAS) Messages displayed per real-world LJ45 parameters.

- Integrated Master Caution/Master Warning offset available for new CAS messages.

- Engine Start/ Reverser Status

- Basic **D**igital **E**lectronic **E**ngine **C**ontrol (DEEC) values for TO thrust setting based on real-world LJ45 performance data. MANUAL Mode option to remove DEEC values.

- DU2 and DU3 Reversion (Display swapping)
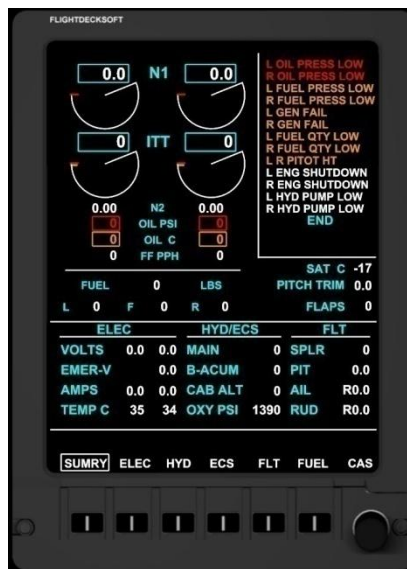
Configuration of the .INI file

To navigate to the EICAS .INI simply use Windows Explorer to find the .INI file that is embedded in the Component folder and click on it to open in Note pad. Make sure that Word Wrap is ON in Note pad.

The .INI file offers the user the option to display the bitmap bezel or to turn it off.

NOTE: .INI File options are typically values of "0" for **OFF** or **No** and "1" for **ON** or **YES**

NOTE: The EICAS is actually an extension of the MFD component of this package. In order to have the MFD function as the EICAS be sure to set [I_AM_DU2(0-1)] to a value of **1** in the MFD .ini file. This holds true even if you intend to use DU Reversion later as the .ini file will store the state of the last used configuration to prevent hardware misalignment.

NOTE: Pay special attention to:

[PLAN_PATH]

"\\FLIGHTDECK\Flight Simulator Files"

[PATH_TO_DU2]

"H:\Software\FDS.com**JET45** PFD"

[PATH_TO_DU3]

"H:\Software\FDS.com**JET45** PFD"

Both MUST point to the location of that component's installation paths. Simply replace the above path with your own installation path. Note that the **[PLAN_PATH]** must be the path back to your Flight Simulator Flight Plan folder location. See section *INSTALLATION REQUIREMENTS AND SETUP* for information on how to run this package with both FS9 and FSX.

PAGE 5-2

<u>Fundamental Engine Indications</u>

N1-

Fan Speed shown as percentage from 0% up to 100.00%

ITT-

Internal Turbine Temperature shown in 1 degree increments from 0 to 1014 degrees.

N2-

Turbine Speed shown as percentage from 0% up to 115%.

OIL PSI-

Oil Pressure shown as degrees Celsius up to 150.

OIL C-

Oil Temperature shown as degrees Celsius up to 175.

FUEL FLOW PPH-

Fuel Flow in Pounds Per-Hour

FUEL QUANTITY-

Fuel Quantity on board in pounds. If the fuel quantity level is at or lower than 330 pounds in the Left or Right wing tanks, amber boxes will surround the **amber** digital value of fuel remaining as a advisory to the crew.

ENGINE INDICATING AND CREW ALERT SYSTEM (EICAS) contd.

Control Surface Trim Values and Positions

Contained within the FLT page is the current Pitch, Ailerons, Spoilers and Flaps positions.

Pitch-

Shows the current position of the pitch trim both graphically and digitally.

Ailerons-

Shows the current position of the aileron trim both graphically and digitally.

Spoilers-

Shows the current position of the spoiler both graphically and digitally. Maximum spoiler value is 60 and due to the spoilers being used as spoilerons it is common to see a spoiler value depicted when turning the yoke to the left or right.

Per real world LJ45 publications, SPOILER AND FLAPS SHOULD NOT BE EXTENDED AT THE SAME TIME.

Flaps-   Shows the current position of the flaps graphically.
                              Flap positions are 0 (UP), 8, 20, and 40 (DOWN).

Flaps Limit Schedule-

8 DEGREES:	250 KIAS
20 DEGREES:	200 KIAS
40 DEGREES:	150 KIAS

THIS SPACE INTENTIONALLY LEFT BLANK

ENGINE INDICATING AND CREW ALERT SYSTEM (EICAS) contd.

Crew Alert System (CAS)

Located in the right-hand side of the EICAS screen is the CAS section that provides the crew various messages that are generated under certain conditions.

CAS Messaging is in 3 colors:

Advisory messages advise the crew of notable events on board the aircraft.

Caution messages advise the crew of items that need attention in a timely manner.

Warning messages advise the crew of items that need attention immediately.

END is displayed at the bottom of the CAS section to signify no other messages.

NOTE: Both **Caution** and **Warning** messages are integrated with the Master Caution/Master Warning system via a dedicated offset. Each time a Caution or Warning message is generated the offset will make available notification that can be used in conjunction with your Interface hardware's output section to force the Master Caution/Master Warning panel to illuminate. It is up to the individual's hardware settings to force their panel to flash as this software will send a continuous signal via the offset. See the FSUIPC offset listing for the custom Master Caution/Master Warning offset.

PAGE 5-5

ENGINE INDICATING AND CREW ALERT SYSTEM (EICAS) contd.

Engine Status

Engine performance monitoring is made simple by observing the N1, ITT, N2, Oil PSI and Oil temperature values presented on the EICAS screen. Any time a parameter's caution or warning value is exceeded; the value becomes boxed and turns **amber** (CAUTION) or **red** (WARNING). Please see the *Known Issues* section for more information regarding Engine Status values.

Thrust Reverse

Above the N1 display on each engine is a thrust reverse status annunciation. When reverse thrust is initially applied **REV** is displayed as the reversers transition from locked to unlocked into idle reverse thrust.

DEP is displayed when the reverse levers are moved to apply any reverse thrust aside from Idle reverse thrust.

DEEC Implementation

Digital **E**lectronic **E**ngine **C**ontrol has been modeled for Takeoff Thrust (TO) in this package. The TO Mode provides a N1 limit value in **magenta** that is located just under the current N1 value as well as a **magenta delta-shaped pointer** that shows the position of where the N1 setting should remain according to the DEEC calculation. DEEC TO Mode data will be displayed anytime the aircraft is on the ground or has flaps set at 8 or greater while in the air. The crew should set takeoff thrust no higher than the value presented in order to gain the best engine performance without exceeding the published engine parameters. The DEEC TO Mode display can be removed by pressing the Manual Fuel Mode button (MAN) on the Engine Start panel if the user has implemented the included MAN Mode offset. See the FSUIPC offset listing for the custom DEEC/MANUAL Mode offset.
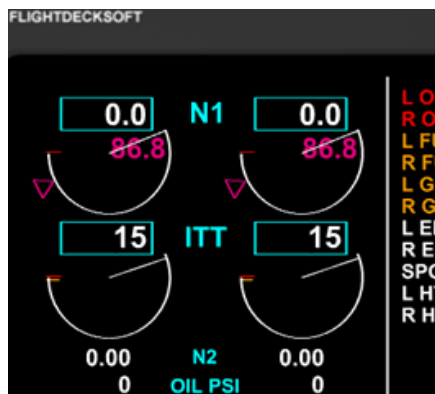
ENGINE INDICATING AND CREW ALERT SYSTEM (EICAS) contd.

N1 Sync

Following the real aircraft, the L and R Engines can have their N1 values synchronized to each other via the N1 Sync function. See the JET45AAS Offset Listing for controlling this feature. Note that just as the real aircraft, the N1 Sync gangs both engine controls to the left throttle lever. Whenever N1 Sync is engaged and landing gear are down, the annunciation is amber, as per the aircraft manual this function is prohibited during ground operations as well as for landing. Normal N1 Sync is used after takeoff through the approach phase before extending the landing gear. The N1 SYNC is annunciated between the Left and Right Engine N1 label.

DU Reversion

For convenience the crew can employ Display Unit Reversion between DU2 and DU3. This is helpful for those who may allow prefer the MFD/NAV Display to be placed on DU2 rather than DU3. DU Reversion is handled by pressing the momentary EICAS REVERSION selector which is located on both ends of the glare shield where the Master Caution/Master Warning panels are located. See the FSUIPC offset listing for the custom DU Reversion offset.

THIS SPACE INTENTIONALLY LEFT BLANK

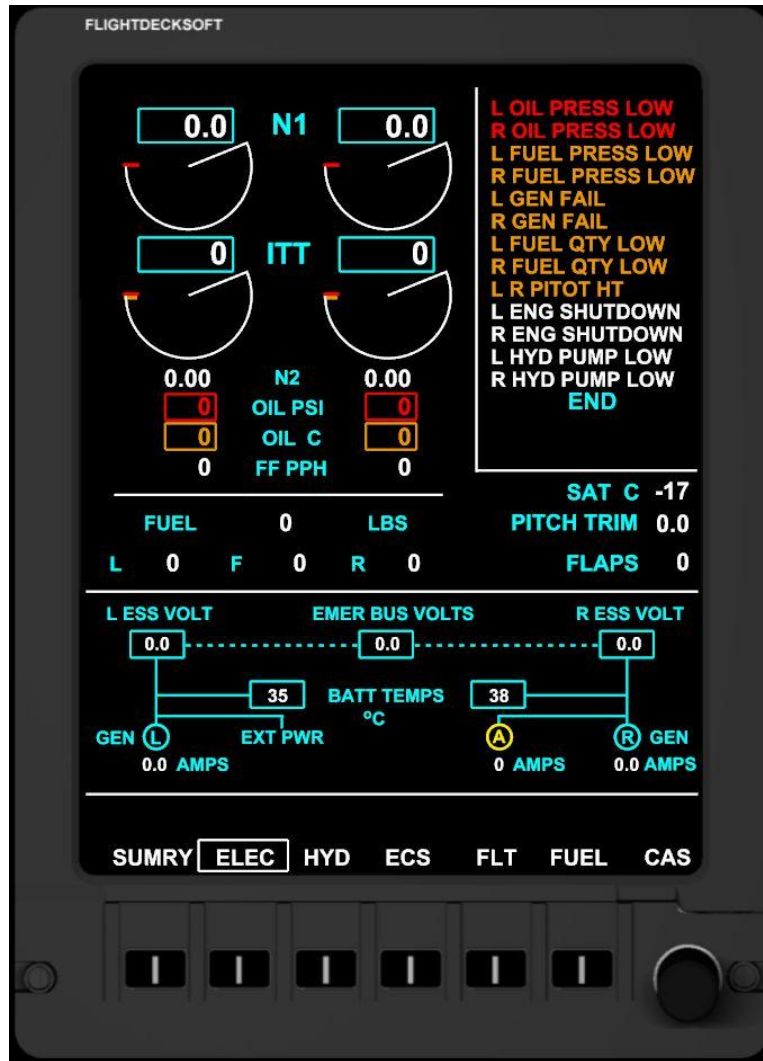# ENGINE INDICATING AND CREW ALERT SYSTEM (EICAS) contd.

EICAS PAGES

SUMRY- Summary Page. Shows an overview of the Electrical, Hydraulic/ECS, and Flight data in addition to the current engine status display.
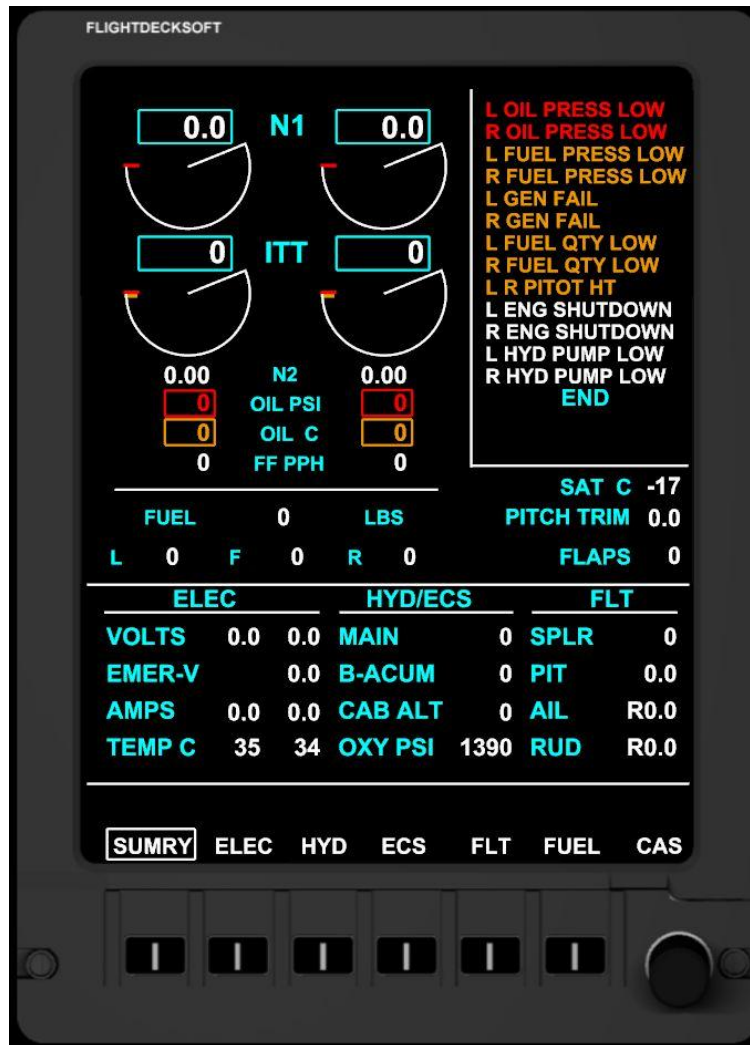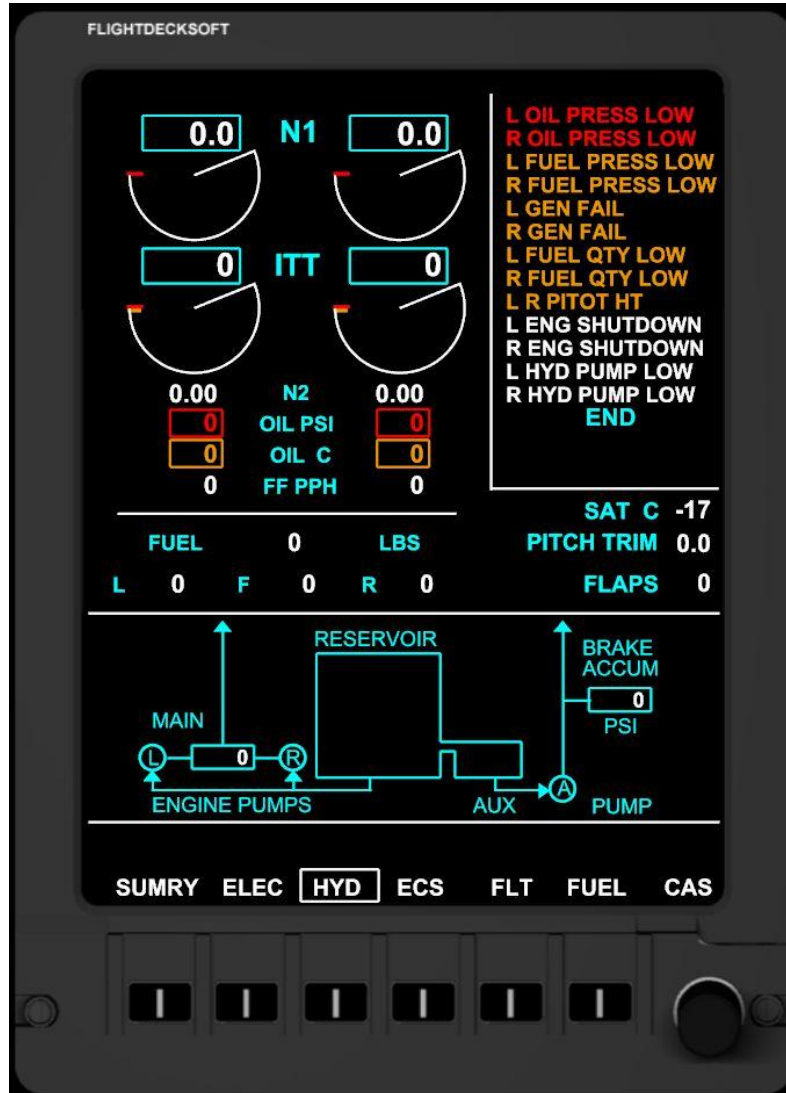
ELEC- Electrical Page. Shows detailed electrical system information in addition to the current engine status display.

Electrical loading activity can be observed while adjusting flaps and other activities.

HYD-   Hydraulic System Page. Shows detailed electrical system information in addition to the current engine status display.

ECS-   Environmental Control System Page. Shows detailed ECS information in addition to the current engine status display.
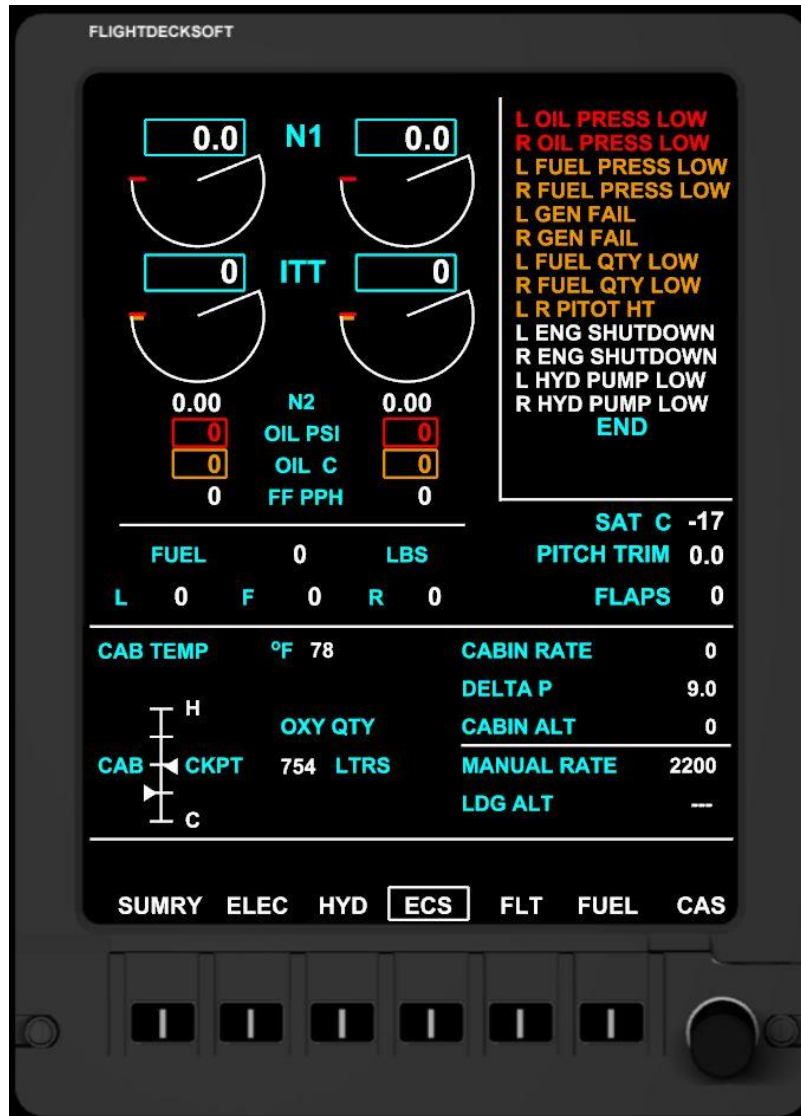
CABIN ALT is dynamic and based on pressure modeling. All other values are typically static within this package.

FLT- Flight Controls page. Shows detailed Aileron/Elevator/Rudder trim values. Shows Flaps, and Spoiler control surface information in addition to the current engine status display.
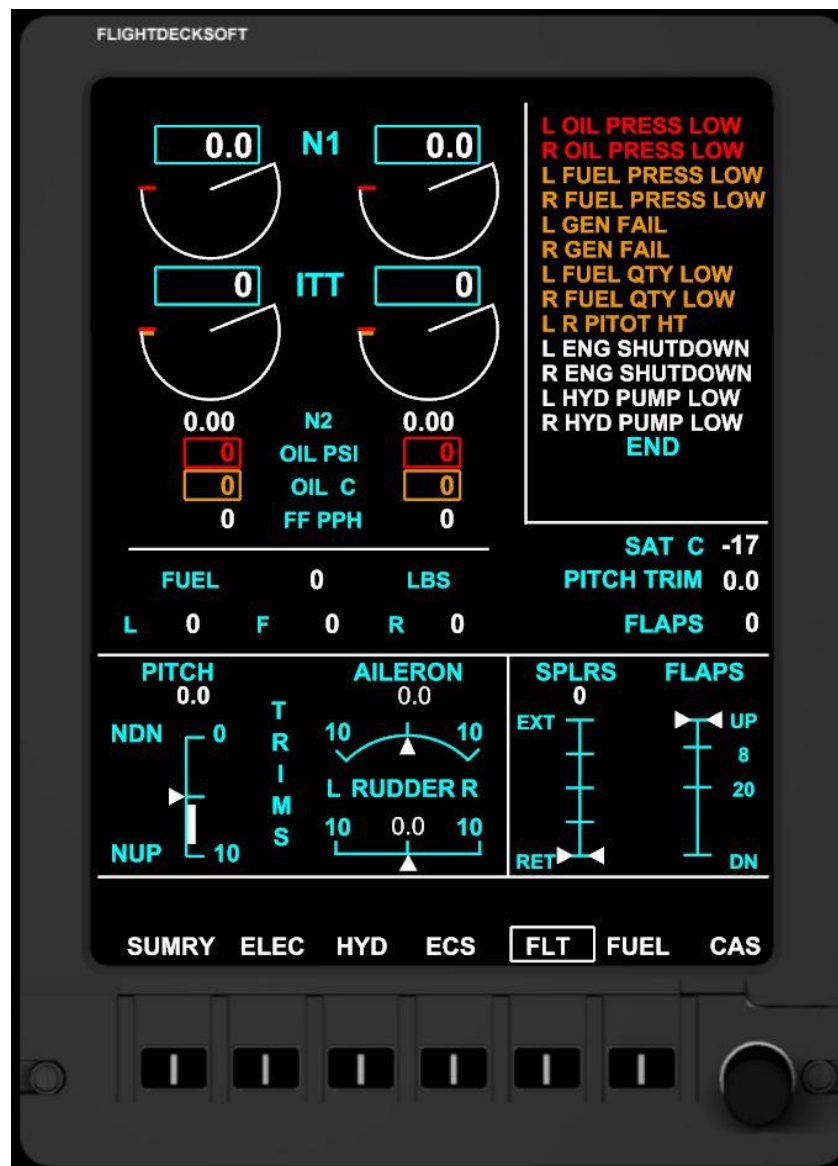
Notice the **white** band on the PITCH trim scale. Pitch trim is typically set within the band for takeoff within FS. Per the LJ45 handbook, it must be set in the band.

FUEL-   Fuel Status Page. Shows detailed Fuel Status information in addition to the current engine status display.
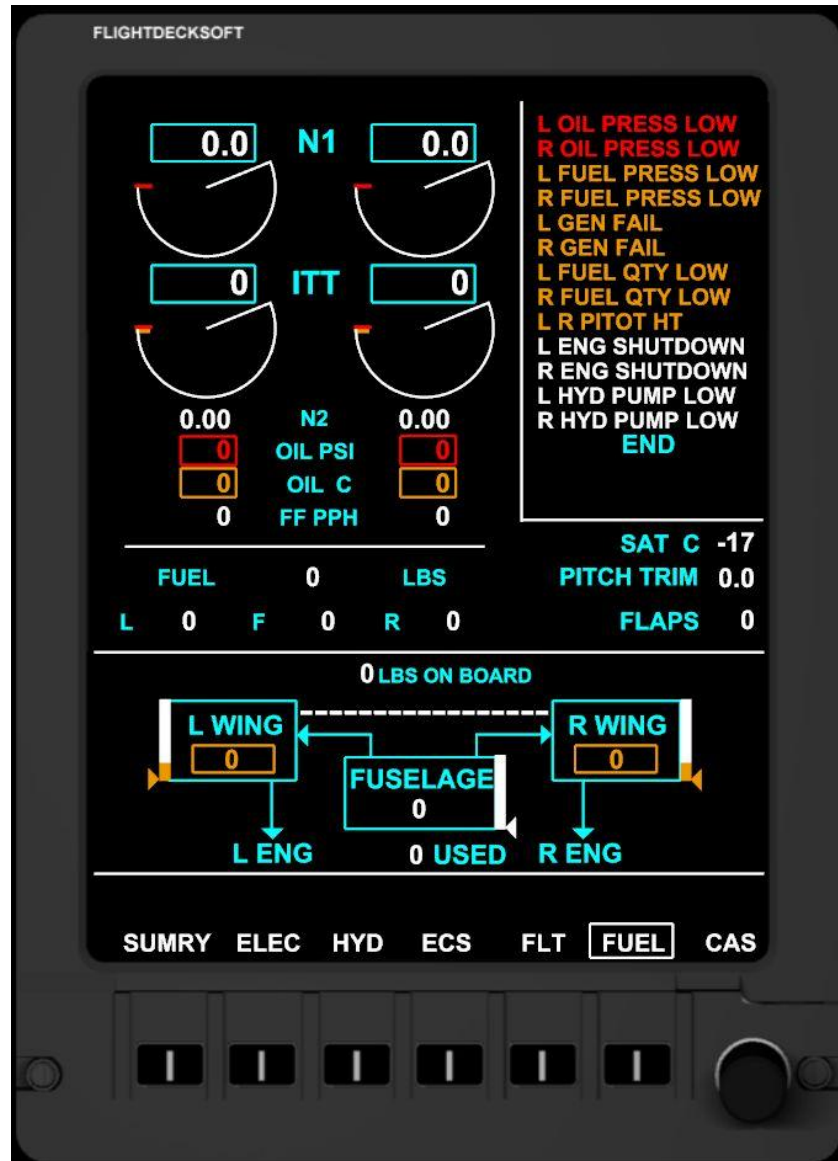
Notice the **amber** boxes shown for the L & R wing tank fuel level. This occurs at 330 lbs and less.

Master Caution/Warning System and Reset

JET45 features a Master Caution/Warning System that alerts the crew to conditions that are considered important for attention based on real-world data. Each time a new Caution or Warning message is displayed in the message center of the Crew Alert System portion of the EICAS screen, the message will flash and an aural alert will be generated•. **Caution** and **Warning** messages will flash until the condition that caused them has been attended to or until the Master Caution Reset (MCR) button is pressed (via offset). Once the MCR is pressed, the flashing message is displayed as a constant text until the condition is resolved. **Advisory** messages (white) will flash for 5 seconds and then be displayed as a steady white message until the condition is resolved.

• The PC running the EICAS software must have speakers turned on to hear the aural alert.

THIS SPACE INTENTIONALLY LEFT BLANK

MULTI FUNCTION DISPLAYS (MFD)

The Flight Deck Soft **JET45** Advanced Avionics Suite provides a realistic representation of the Multi Function Displays (PFD) found in the LJ40/45. The MFDs typically are displayed on DU 3, but the user may elect to display it on DU2 using DU Reversion.

Main Features:

•	 Flight Plan Route depiction with waypoints and navaids in MAP Mode.

•	Route depiction with de-clutter coding to allow easy viewing of navaids depending on Range Scale

•	6 Select Keys to access several pages of information regarding Flight Plans, navaid depiction, system summary, etc.

•	Support for Rotary Encoder to adjust Map Range and to select Flight Plans.

•	Flight Plan selection (up to 50 in the list available at any one time).

•	Flight Plans can be switched and depicted on the fly

•	TCAS detection and display with adjustable display range of 6NM+

•	Attractive Display Unit bezel artwork for users without dedicated hardware

<u>**THIS SPACE INTENTIONALLY LEFT BLANK**</u>

MULTI FUNCTION DISPLAYS (MFD) contd.

Configuration of the .INI file

To navigate to the PFD .INI simply use Windows Explorer to find the .INI file that is embedded in the Component folder and click on it to open in Note pad. Make sure that Word Wrap is ON in Note pad.

The .INI file offers the user the option to:

Display the bitmap bezel or to turn it off.

Limit Airport Depiction based on length of Runway-(useful for preventing clutter)

Set the Flight Plan path from FS over the network. The flight plan path must be set to the very same location on the server if used over a network.

NOTE: .INI File options are typically values of "0" for **OFF** or **No** and "1" for **ON** or **YES**

NOTE: The MFD is actually a base component of the EICAS component of this package. In order to have the MFD function as the MFD be sure to set [I_AM_DU2(0-1)] to a value of **0** in the MFD .ini file. This holds true even if you intend to use DU Reversion later as the .ini file will store the state of the last used configuration to prevent hardware misalignment.

MFD DESCRIPTION

The MFD is typically used to display the Flight Plan (FP) Route, TAS, SAT, GS, TCAS, and various critical aircraft system data. The MFD is mainly comprised of a large compass arc that shows a degree indicator line every 5 degrees and a **magenta** heading bug with bug direction arrow pointing to the closest side the bug is located when the bug is off scale. The compass arc is capable of displaying different ranges to increase or decrease the amount of FP Route displayed in **2.5, 5, 12.5, 25, 50, 100, 150, 250**, and **500** nm ranges. The compass line represents **2x** the distance indicated by the range ring value. The simulator's Air Data Computer (ADC) calculates the current wind speed and direction and then displays it on the center left side of the compass arc.

MULTI FUNCTION DISPLAYS (MFD) **contd.**

OPERATION OF THE MFD

<u>Flight Plan Selection and Loading</u>

The MFD can display the last 50 flight plans that are pulled from the MSFS flight plan location on your FS Server.

IMPORTANT NOTE: The MFD can read standard MSFS .pln Flight Plan text files that are generated via the default MSFS flight planner, FS Build, Simroutes.com, and any other flight planner that uses the .pln format. –HOWEVER- Be sure to only allow your Flight Plan folder on the server to hold no more than 50 Flight Plans at any one time to prevent the MFD from crashing.

Once you are given a choice of Flight Plans to load, scroll through the list by clicking on the Rotary Selector labeled **M/P RNG** on the right of the DU Bezel. A selection box will appear over the plan that will be loaded upon pressing the **LOAD FPLN** button once again. The chosen FP should appear now with the aircraft symbol at the starting point of the FP. Press **RTN** to Return to the main menu.

<u>Displaying Navaids, Waypoints, and Route Information</u>

Up to 8 total VORs, NDBs and Airports (up to 4 of each type) can be displayed on the MFD by selecting NAV and APT. Route waypoints (including intersections) are displayed when a route is loaded by the user.

Route progress is depicted by having "next waypoints" remain magenta until "passed". A passed waypoint will turn white.

MULTI FUNCTION DISPLAYS (MFD) contd.

USER GUIDE: Be mindful that while you may load a new Flight Plan into the MFD the aircraft will not track the new Flight Plan while in NAV Mode due to the plan not being loaded in FS until you go into the FS menu and select/load the new Flight Plan desired. This will hopefully be addressed once a CDU/FMS is considered.

Aircraft Systems

Aircraft Systems may be reviewed by pressing the **SYS** option on the DU Bezel. From there various choices can be selected and information reviewed. **SUMRY** shows a snapshot of three critical Aircraft Systems- *Electrical, Hydraulic and Flight Surface Trim indications*. Pressing **ELEC, HYD, ECS, FLT, and FUEL** displays a more in-depth depiction of the system of that page. Pressing **RTN** will return to the main MFD screen menu. Pressing **SUMRY** returns the Summary Page and pressing **RTN** returns to the main MFD page. Note that some systems still show "0" values and may be completed with the release of the JET45 SYSTEMS Software Module.

THIS SPACE INTENTIONALLY LEFT BLANK

ELEC (Electrical Page)

The Electrical Page contains electrical system information and a basic schematic of the system.

Illustration 6-A

PAGE 6-5

MULTI FUNCTION DISPLAYS (MFD) contd.

HYD (Hydraulic Page)

The Hydraulic Page contains information on hydraulic quantities and schematics.

Illustration 6-B

PAGE 6-6

ECS (Environmental Control System Page)

The ECS Page displays cabin/cockpit temperatures as well as oxygen quantity.

Illustration 6-C

CABIN ALT is dynamic and based on pressure modeling. All other values are typically static within this package.

PAGE 6-7

FLT (Flight Page)

The FLT Page displays the elevator, aileron, and rudder trim positions as well as the positions of both the flaps and speed brake/spoiler.

Illustration 6-D

PAGE 6-8

FUEL (Fuel Page)

The Fuel Page contains the amount of fuel in the Left, Center, and Right fuel tanks. When the fuel level in the Left or Right wing tank reaches 350 lbs or less, a yellow box encompasses the fuel remaining as a caution of the low fuel levels.

Illustration 6-E

Notice the **amber** boxes shown for the L & R wing tank fuel level. This occurs at 330 lbs and less.

PAGE 6-9

MULTI FUNCTION DISPLAYS (MFD) contd.

Traffic Collision & Avoidance System (TCAS)

The **JET45** AAS features TCAS that detects AI aircraft and displays their position relative to the aircraft. At this time live traffic from online sessions is not displayed on the TCAS screen.

Illustration 6-F

TCAS screen with no aircraft in the vicinity   TCAS screen with 3 aircraft in the vicinity

TCAS targets are shown as a colored diamond with a numerical value as well as a (+) or (-) sign next to them. The numerical value indicates the altitude difference between the aircraft and the target and the sign indicates whether the target is above or below the aircraft.

Proximity targets are **Cyan**

Caution/Traffic advisory targets are in **Amber**

Warning/Resolution advisory targets are **Red**.

TCAS Range is displayed as an adjustable nm value at the 3 o'clock position on the range line with a fixed range of 2 nm symbolized by the near-field 360 degree range ring. The range can be adjusted by the **–** and **+** key.

PAGE 6-10

TCAS Altitude Band

The TCAS Altitude Band is selected via LSK 5 on the RMU. Three different altitude bands, or modes, are selectable.

• NORMAL- Displays TCAS targets that are between 2,700' below the aircraft's current altitude and 2,700' above the aircraft's current altitude.

• ABOVE- Displays TCAS targets that are between 7,000' above to 2,700' below the current altitude.

• BELOW- Displays TCAS targets that are between 2,600' above to 7,000' below the current altitude.

The band selected annunciates in the TCAS window of the MFD as well as in the TCAS display window of the RMU as shown below.

RADIO MANAGEMENT UNITS (RMUs)

The Flight Deck Soft **JET45** Advanced Avionics Suite provides a realistic representation of the Radio Management Units found in the LJ40/45. The RMUs typically are displayed with NAV1/NAV2, COM1/COM2, ADF, AND XPONDER Information, but the user may elect to display the Backup Engine or Navigation functions on these units just like the real-world counterpart does in the event of DU Failure.

Main Features:

• NAV1/COM1 on RMU1 and NAV2/COM2 on RMU2 as well as ADF and ATC.

• Functional Line Select Keys for Transfer and Function Input

• Support for Dual Rotary Encoder for proper functionality

• Storage of NAV/COM frequencies for call up by the user via the Line Select Keys.

• Backup Navigation (ILS) Page

• Multiple Backup Engine Pages

• Transponder integrated with Squawk Box software

• Attractive RMU Bezel artwork for users without dedicated hardware

PAGE 7-1

RADIO MANAGEMENT UNITS (RMUs) _{contd.}

Configuration of the .INI file

To navigate to the RMU .INI simply use Windows Explorer to find the .INI file that is embedded in the Component folder and click on it to open in Note pad. Make sure that Word Wrap is ON in Note pad.

The .INI file offers the user the option to:

Display the bitmap bezel or to turn it off.

Designate if the software is operating as RMU1 or RMU2

NOTE: .INI File options are typically values of "0" for **OFF** or **No** and "1" for **ON** or **YES**

THIS SPACE INTENTIONALLY LEFT BLANK

RADIO MANAGEMENT UNITS (RMUs) contd.

RMU Window Sizing

The RMU can be resized and positioned while in non-bezel mode.

 • Remove Bezel (right click)

 • Move graphics (A,D,W,X Key press) while in bezel-less mode

 • Scale graphics (Q,E Key press) while in bezel-less mode

THIS SPACE INTENTIONALLY LEFT BLANK

RADIO MANAGEMENT UNITS (RMUs) contd.

Line Select Keys

RMU Line Select Key (LSK) Guide

Illustration 7-a

Interfacing Line Select Keys

The RMU Line Select Keys can be fully interfaced via dedicated offsets. See FSUIPC Offset Usage.

PAGE 7-4

RADIO MANAGEMENT UNITS (RMUs) contd.

Function Keys

PGE

The Page Menu is accessed via the PGE selection key located on the lower RMU bezel.

DIM

Press to enter the dimming mode for each RMU via the TUNE knobs. Turning the TUNE knobs will increase or decrease the RMU screen brightness if interfaced.

ID

Press to squawk "IDENT" for Squawkbox use.

STO

Press to store NAV/COM frequencies

RADIO MANAGEMENT UNITS (RMUs) <small>contd.</small>

RMU Pages

Radio Page-

Main RMU page to access NAV/COM/ADF/ATC

COM Memory-

COM frequency storage

NAV Memory-

Navigation frequency storage. Up to 10 frequencies may be stored by the user.

ATC/TCAS-

Aircraft identification and TCAS information.

TA DISPLAY- TCAS display modes are selected here. Modes are Automatic or Manual.

Automatic Mode removes the TCAS window from the MFD unless a Traffic Advisory (TA) is generated via TCAS. The TCAS window remains visible until the is resolved.

Manual Mode allows the TCAS window to remain open and visible at all times.

THIS SPACE INTENTIONALLY LEFT BLANK

PAGE 7-6

RADIO MANAGEMENT UNITS (RMUs) <small>contd.</small>

Return-

Returns to the Radio Page screen

Navigation-

Provides backup Navigation/ILS display information. CRS is adjustable via the rotary encoder after selecting LSK 6.

Engine Pg 1-

Analog L/R Engine scale. N1, ITT, Fuel

Engine Pg 2-

Digital L/R Engine scale. N1, ITT, Fuel

Maintenance-

NON FUNCTIONAL

<u>**THIS SPACE INTENTIONALLY LEFT BLANK**</u>

FLIGHT GUIDANCE CONTROLLER (FGC)

Flight Deck Soft **JET45** Avionics Suite **does not currently feature** a functional FLIGHT GUIDANCE CONTROLLER. The information below provides information on how to enjoy flights without the use of a software-driven FGC.

THIS SPACE INTENTIONALLY LEFT BLANK

PAGE 8-1

Using NAV hold to fly a preloaded flight plan

Anytime NAV hold on the Flight Guidance Controller is pressed and the autopilot is engaged the aircraft will fly to the source selected via the EFIS Display Controller. If a flight plan is loaded and **FMS** is selected, the aircraft should follow the loaded flight plan. If **NAV** is selected as the navigation source then the aircraft should turn and intercept the radial course bearing of the VOR that is tuned to NAV1.

NOTE: The aircraft will only follow a flight plan if it has been loaded into the simulator first.

NOTE: The green arrow above the EADI on the PFD indicates the FD that is currently sending the commands to the Autopilot. Use the XFR offset to switch sides if needed.

See additional notes on NAV usage in the **CDU/FLIGHT MANAGEMENT SYSTEM** Section 10.

SPD Hold & VS (Vertical Speed Mode)

The LJ45 uses a single rotary encoder to control both the Vertical Speed (**VS**) and forward speed (**SPD**) while in a climb or decent. It should be noted that **SPD** mode **DOES NOT** control the throttle nor forward speed while straight and level as the LJ45 has no auto throttle system.

Using the default LJ45 the crew has control over their VS via the vertical speed rotary encoder. Forward speed must be maintained by throttle position as the SPD hold function is not currently modeled in the **JET45 AAS**.

THIS SPACE INTENTIONALLY LEFT BLANK

EFIS DISPLAY CONTROLLER (EFIS)

The Flight Deck Soft **JET45** Advanced Avionics Suite contains an EFIS DISPLAY CONTROLLER. The EFIS Display Controller component gives both crew members control over what sources of navigation data is displayed on their respective Primary Flight Display.

Main Features:

• Bearing 1 & 2 Nav Data Select ability for both Pilot and Copilot Displays

• Functional push button assignments for In/hPa, HSI (Arc/Map Modes), FMS/NAV source selectors.

• Dedicated FSUIPC offsets for proper functionality with Rotary Selector Hardware

• Attractive EFIS Display Controller artwork for users without dedicated hardware

Illustration 9-a

Configuration of the .INI file

To navigate to the EFIS .INI simply use Windows Explorer to find the .INI file that is embedded in the Component folder where it was installed and click on it to open in Note Pad. Make sure that Word Wrap is ON in Note Pad. Make certain to elect if the component is for Captain (0) or Co-Pilot (1) usage. See the example below.

[CAP_EFIS=0,CO_EFIS=1] *1* OR *2* DEPENDING ON WHICH SIDE INSTALLED ON

EFIS DISPLAY CONTROLLER (EFIS)contd.

EFIS Functions

The seven momentary pushbuttons across the top of the EFIS panel are described below.

In/hPa- Switches between Inches of Pressure and hectoPascals (millibars)

CUE- Switches the Flight Director style from Inverted V to Cross Hair. Inverted V is the default and only mode available currently.

FPA- Flight Path Angle. Currently Unavailable.

WX- Weather Radar Display. Currently Unavailable.

HSI- Toggles between Map and Arc modes on the HSI compass. Map is the default setting.

FMS- Displays GPS/FMS information on the HSI. NAV source is from the GPS/FMS.

NAV- Displays VOR & Localizer information on the HSI. Pressing NAV once causes the CDI to show data received via NAV1; Pressing a second time causes the CDI to show data from NAV2. CDI Deviation is currently only available from NAV1.

The two rotary selector switches across the bottom of the EFIS panel are described below.

BRG O

FMS- The bearing points to the GPS/FMS waypoint loaded via the Flight Planner

ADF- The bearing points to the NDB waypoint tuned via ADF1

NAV- The bearing points to the VOR waypoint tuned via NAV1

OFF- Turns off the bearing pointer

BRG <>

FMS- The bearing points to the GPS/FMS waypoint loaded via the Flight Planner. FMS2 is not modeled at this time.

ADF- The bearing points to the NDB waypoint tuned via ADF2

NAV- The bearing points to the VOR waypoint tuned via NAV2

OFF- Turns off the bearing pointer

OUTBD DU/INBD DU DIM-   Provides Display Unit Dimming. See Offset Listing.

PUSH TO TEST-   Currently Unavailable.

Special Notice:

EFIS.exe- **Do not** run the JET45 EFIS.exe AND have your hardware interfaced/using the EFIS offset at the same time. The EFIS.exe is simply there for the users who have no hardware to handle EFIS functions and need something to click on. EFIS functions are still available even without the EFIS.exe running, but it's just a visual component and will cause offset issues if it's running while you are using hardware to control EFIS functions. Having both running essentially confuses the components because the hardware and the software are writing offsets on top of each other.

THIS SPACE INTENTIONALLY LEFT BLANK

Using the EFIS Display Controller in conjunction with the FGC

Anytime NAV hold on the Flight Guidance Controller is pressed and the autopilot is engaged the aircraft will fly to the source selected via the EFIS Display Controller. If a flight plan is loaded and **FMS** is selected, the aircraft should follow the loaded flight plan. If **NAV** is selected as the navigation source then the aircraft should turn and intercept the radial course bearing of the VOR that is tuned to NAV1.

NOTE: The aircraft will only follow a flight plan if it has been loaded into the simulator first.

THIS SPACE INTENTIONALLY LEFT BLANK

PAGE 9-4

CDU/FLIGHT MANAGEMENT SYSTEM (CDU/FMS)

The Flight Deck Soft **JET45** Avionics Suite **does not currently feature** a CDU/FMS component. Please keep in mind that if you see 'FMS' listed in this manual that it is actually referring to the GPS component of Flight Simulator which is acting as FMS until further notice.

However it should be noted that aside from automatic performance calculations and MFD/NAV Display Route updates on the fly, this package is perfectly suited for typical private/corporate aviation flying. In fact up until very recently the Learjet 45 had the CDU/FMS as an option to the customer because it is simply not a required component of the aircraft. As such, not using a CDU presents few limitations that can be easily overcome. Those limitations include:

• Manual performance calculations for V Speeds and some Engine Limits

• No changing of the Flight Plan Route depiction on the MFD/ND via addition or deleting of waypoints, etc. without a working CDU/FMS. (Flight Plans can be <u>changed</u> to a different route but **not** <u>modified</u> on the fly).

USING THIS PRODUCT WITHOUT A CDU/FMS PRODUCT

The Flight Deck Soft **JET45** Avionics Suite's combination of flight plan depiction within the MFD/ND page as well as a comprehensive EFIS Display Controller gives the user the ability to have the aircraft fly the pre-planned, pre-loaded flight plan via the NAV function within Flight Simulator. The user must follow the procedures below in order to have the aircraft fly the route automatically when using NAV:

• Create and Save your desired Flight Plan with any flight planning software that uses the default .pln format. Some planners tested include the default planner, *FS Build,* and *Sim Routes.* Be sure to save the route with a simple name to insure the route name displays properly in the list of available routes in the FP page on the MFD/ND. For example: **KICT-KATL, ICT-ATL**.

• Load the plan first into FS via the Load option under Flight Planner in FS9/FSX.

• To load a flight plan in the avionics suite click on the **MFD** button and then the **LOAD FPLN** button on the MFD DU Bezel. This can only be done once the AVIONICS are on.

• Select the proper source for navigation via the EFIS (FMS or NAV)

PAGE 10-1

CDU/FLIGHT MANAGEMENT SYSTEM (CDU/FMS) contd.

Using NAV hold to fly a preloaded flight plan

Anytime NAV hold on the Flight Guidance Controller is pressed and the autopilot is engaged the aircraft will fly to the source selected via the EFIS Display Controller. If a flight plan is loaded and **FMS** is selected, the aircraft should follow the loaded flight plan. If **NAV** is selected as the navigation source then the aircraft should turn and intercept the radial course bearing of the VOR that is tuned to NAV1.

NOTE: Currently the last pressed FMS/NAV source on the Pilot or Copilot EFIS panel will determine which side is the Master Side. The XFR switch is what actually determines the Master Side and is depicted by the direction the green arrow is pointing to on the top of the PFD. The XFR function is under development.

IMPORTANT NOTE: Having the desired flight plan loaded in the avionics suite via the MFD/ND will not result in flight plan route following. The user MUST load the flight plan into the sim or engaging the NAV button will only cause the aircraft to fly a due north route. As such, the aircraft will only fly the route that has been loaded into the sim via the Flight Planner regardless of what plan is depicted on the MFD/ND.

Friendly Panels LJ45 panel replacement

It is highly recommended that until a CDU component is created for the user to consider the Friendly Panels LJ45 (FPLJ45) panel replacement add-on. The FPLJ45 package will not allow the user to modify the existing flight plan that is filed with MSFS ATC nor will it update the flight plan route as depicted on the MFD/Nav Display, but the unit adds additional functionality to your simulator by offering several real-world functions of the CDU model it is based on. Some of those functions are:

• 	Automatic tuning of the closest navaids

• 	Facility data lookup for any airport including runway data, com and nav. frequency information

• 	Performance and Estimated Time En route calculations

RESERVED

THIS SPACE INTENTIONALLY LEFT BLANK

FSUIPC OFFSET USAGE

The Flight Deck Soft **JET45** Avionics Suite is able to interact with FS and the user via FSUIPC Offsets. It is important that the user be familiar with their Interfacing Hardware and Software to successfully access all of the various functions of the **JET45** software suite.

Main Features:

• All custom **JET45** functions are allocated dedicated FSUIPC offsets that should not conflict with other software packages.

• All the FSUIPC offsets are included in your download package in a printable spreadsheet format.

USER GUIDE:

• Be mindful to pay particular attention to what FSUIPC offset you are assigning to your hardware due to the numerous Offset/Bit/Function options.

THIS SPACE INTENTIONALLY LEFT BLANK

THIS SPACE INTENTIONALLY LEFT BLANK

KNOWN ISSUES

Date of Issue: <u>February 2, 2010</u>

Below is a list of known issues of this package where a resolution has not been implemented to date:

- DEEC Limits: DEEC settings will occasionally be displayed after flaps are raised until throttle position is adjusted or reduced from initial TO thrust setting. However, the DEEC limits are valid and can be used to set max thrust if displayed.

- MFD Off-Scale Arrow: Occasionally the Off-Scale Arrow will not properly indicate the shortest direction to the HDG Bug.

FS9 VS. FSX

Listed below is a list of known issues that differ between using FS9 and FSX with this package where a resolution has not been found to date. Note that these issues likely stem from the simulator itself and are simply replicated or displayed by the avionics software.

- EICAS shows abnormally high values for Oil Pressure/Temperature while using FS9.

- ITT Values typically run a bit high in FS9 and will cause a red box sooner than FSX. Currently the only solution is to ignore the high values as JET45 simply models the published data for engine limitations.

LEARJET 45 COMPONENT ILLUSTRATIONS

MAIN INSTRUMENT PANEL (MIP) LAYOUT

The major components of the LJ45 MIP are illustrated below.

LEARJET 45 MAIN INSTRUMENT PANEL LAYOUT
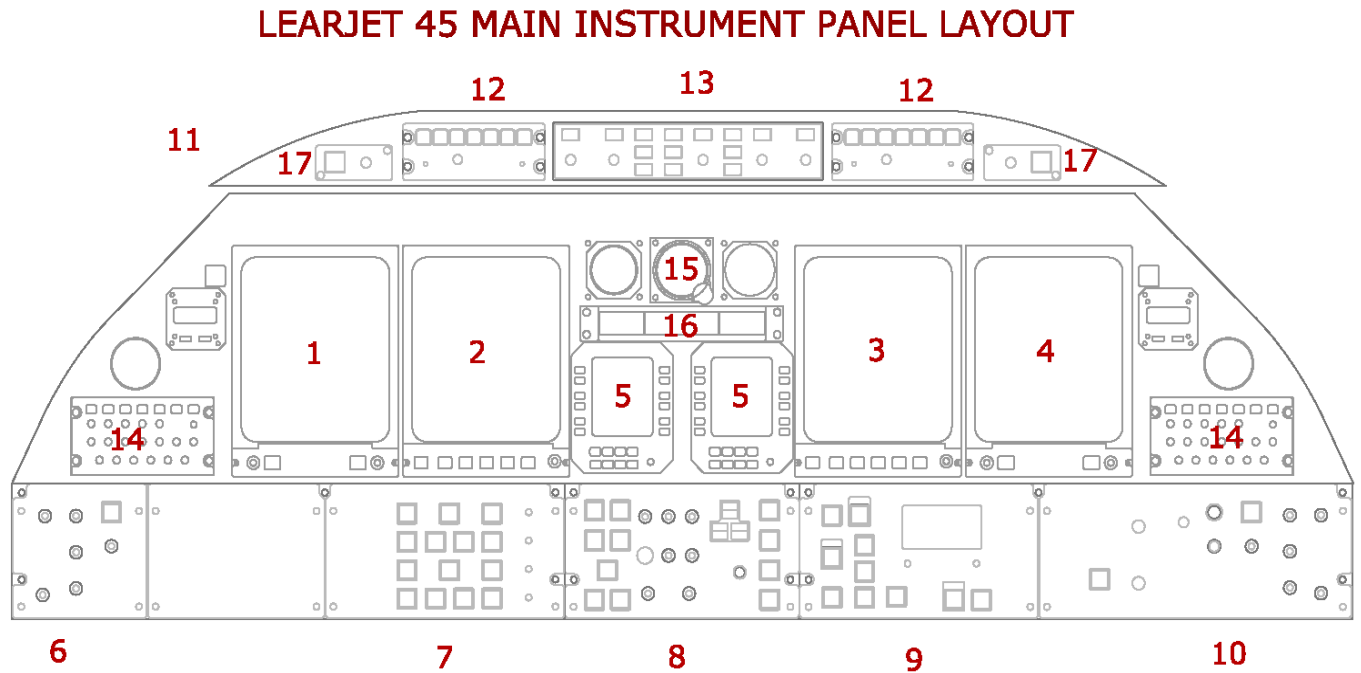
1   PILOTS PRIMARY FLIGHT DISPLAY (PFD/ DU1)
2   ENGINE INDICATIONS CREW ALERT SYSTEM DISPLAY (EICAS/ DU 2)
3   MULTIFUNCTION DISPLAY (MFD/ DU 3)
4   COPILOTS PRIMARY FLIGHT DISPLAY (PFD/ DU 4)
5   RADIO MANAGEMENT UNITS (RMUs 1 & 2)
6   PILOTS LIGHTING CONTROLS
7   ELECTRICAL PANEL (BATTERIES, AVIONICS, GENERATORS)
8   HYDRAULIC/EXTERIOR LIGHTING PANEL (LANDING GEAR, TAXI/LANDING LTS, STROBES/BEACON/NAV LTS, ANTI ICE)
9   PRESSURE CONTROL PANEL (NON FUNCTIONAL)
10 ENVIRONMENTAL/ COPILOTS LIGHTING CONTROLS
11 GLARE SHEILD (CONTAINS AUTO PILOT CONTROLS)
12 DISPLAY CONTROLLER/ EFIS
13 FLIGHT GUIDANCE CONTROLLER (AUTOPILOT PANEL- NAV, YD, HDG, CRS, ALT, APP, ETC.)

APENDIX A-1

LEARJET 45 OVERVIEW

The LEARJET 45 OVERVIEW is provided to give users supplemental information that will help get the most out of the avionics software as well as the operation of the simulator as well.

AIRCRAFT DESCRIPTION

General

Crew of 2 with 8 passengers

Performance

1960 NM range (XR Model)

330 KIAS or.81 Mach max operating speed

51,000' max certified operating ceiling

APENDIX B-1

OPERATIONAL TIPS

Auto Engine Startup-

Proper Procedure (If using with LJ45)

The LJ45 features a fully automated engine start sequence. After moving the throttle levers from the CUTOFF position to IDLE and upon pressing and releasing the desired momentary engine start switch, that engine should begin its start up from shut down to running at idle by pressing nothing more than the START switch itself. The EICAS will show **START** on the outboard side of the engine during the start process and briefly show **START** indicating that the starter is running with an N2 setting >51%. If the start switch is still sending the start command the EICAS will continually show **START** indicating that it should be set to OFF. The automatic start procedures also bring the aircraft's generators online for each respective engine without need for the crew to actually turn the generators on individually. Once online the **L GEN FAIL** and **R GEN FAIL** CAS messages will extinguish. If the start sequence fails to bring the generators online then the **L GEN FAIL** and **R GEN FAIL** CAS messages will continue to be displayed until brought online. The generators may be brought online manually if you have interfaced them separately via your interface hardware.

Interfacing

The level at which you are able to interface your start switches to perform an auto start greatly depends on the interface software that your hardware uses. Testing of this start up procedure reveals that FS9 and FSX behave differently from each other and some creativity may be required to get the desired result if using the default FSX Learjet 45. The reason for this is due to an attempt by MS to have the start sequence be a bit more automated in FSX than in FS9 but it actually creates a problem for some home simulator builders using the default LJ45. When pressing the START switch in FSX it treats the mouse click or setting of the proper FSUIPC offset as an latching/alternate switch instead of the momentary switch that it actually is. In effect, the START switch stays on until you click on it in the bitmap panel to turn it off.

The method used for creating an auto engine start sequence that works prototypically in FS9 is to have the interface software set up to give two commands upon the start switch being pressed: 1) START L or R Engine and 2) Turn ON L or R Generator.

APENDIX B-2

LEGAL DISCLAIMER

BRANDING AND TRADEMARKS

ANY AND ALL WORDING CONTAINING LEARJET, LEARJET 45, LJ45, L45 ETC. ALL BELONG TO BOMBARDIER. FLIGHTDECKSOFT MAKES NO CLAIM TO THESE BRANDS, MODELS, TRADEMARKS OR ANY OTHER COMMERCIAL INTERESTS. ANY OTHER BRAND NAMES OR TRADEMARKS USED WITHIN THIS DOCUMENTATION IS SIMPLY A REFERENCE TO OTHER PRODUCTS AND ARE IN NO WAY INTENDED TO REFLECT ANY RELATIONSHIP BETWEEN THEM AND FLIGHTDECKSOFT. JET45 AVANCED AVIONICS SYSTEM IS A BRANDNAME & TRADEMARK RESERVED EXCLUSIVLEY FOR FLIGHT DECK SOFT AND FLIGHTDECKSOFT.COM.

INTENDED USE

THE SOFTWARE THAT THIS MANUAL REFERS TO IS INTENDED FOR HOBBY USE ONLY. USE OF THIS SOFTWARE SIGNAFIES AN AGREEMENT TO HOLD FLIGHTDECKSOFT FREE FROM ANY AND ALL LIABEL, CONTRACT, OR GUARANTEE OF ANY FORM OR FASHION. USE OF THIS SOFTWARE IS AN AGREEMENT TO NOT USE IT IN ANY FORM OR FASHION RELATED TO REAL-WORLD AVIATION, NAVIGATION, OR TRAINING.

PAGE L-1

END USER MANUAL