SUBJECT: AVIONIC DATA RECOVERY ON ENGINE START

REASON: Explain the procedures to recover avionics system data after engine start

AVIONIC DATA RECOVERY ON ENGINE START:

1. ON GROUND ENGINE START

During the on ground engine start, in the procedures it is recommended to set Avionics System Master Switches to OFF position.

The systems non-affected by the Avionics Master Switches, on the worst case, can be lost during engine start, except equipments connected to Back-Up Battery.

After the engine start, when the Avionics Master Switches are set to ON position, the system recovery will be produced. The system recovery state will be displayed on the following table. The procedure for recovering the system configuration before engine start is also shown on the table.

NOTE: The amount of lost systems and the duration of the lost, depends on operational margins of each equipment, batteries charge, start duration, whether there is an operative engine and its speed. On the most critical situation, all systems can be momentarily lost, except equipments connected to Back-Up Battery.

SYSTEM	AFTER RECOVERY STATE	RECOVERY PROCEDURE
EFIS	Wait until displays and IOPs PBIT finish. Displays parameters by default: • **DH** –1ft (non-displayed) • **Speed bugs** 49 kts (non-displayed) • **Barocorrection** Last selection • **Selected Altitude** 0 ft • **Selected Heading** 0º (North) • **Selected Course** FMS DTK (Pilot) VOR/LOC 0º (North) (Co-pilot) • **Navigation System** FMS1 (Pilot), VOR/LOC2 (Co-pilot) • **Bearing Pointer-1** ADF1 (Pilot) VOR1 (Co-pilot) • **Bearing Pointer-2** VOR2 (Pilot) TACAN o ADF2 o ADF1 (Co-pilot) (depending on the installed equipment) • **Navigation Display:** Rose, Heading-up, WX OFF, MAP OFF, TCAS AUTO.	If any parameter had been changed before engine start, desired values must be selected again.

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SYSTEM	AFTER RECOVERY STATE	RECOVERY PROCEDURE
FMS	Wait until FMS2 and MCDUs PBIT finish. MCDU1 starts at FMS1 active page. MCDU2 starts at FMS2 initialization page. If FMS1 has been prepared with initial position, weight, performances, flight plan, etc., the data transfer procedure is started automatically. It synchronize FMS2 with FMS1. The duration of this procedure is over 60 seconds and it is announced on MCDU with a CROSSTALK INIT message in scratchpad line. After data transfer, FMS2 has the same parameters (flight plan, etc.) as FMS1 FMS1 displays several fail messages about sensor loss during engine start.	Reset all fail messages. If FMS1 has been prepared with initial position, weight, performances, flight plan, etc., no action must be performed.
IRS/GPS	If IRS/GPS has been aligned, this alignment will be lost.	IRS/GPS new alignment must be done. If, before engine start, the alignment have to be done and IRS/GPS are set OFF, and do not move the aircraft, a Stored Heading Alignment can be performed.
COMMUNICATIONS	Wait until IOP and MCDUs PBIT finish. MCDU1 starts at FMS1 active page. MCDU2 starts at FMS2 initialization page. By pushing RMS key, RMS will be initialized on RCOM page. Previous parameters, frequencies, channels and selections remain. IFF is the only exception. It starts by default with IFF1 in STANDBY mode to avoid the transmission of undesired codes or modes. Previous modes and codes remain.	Select the desired IFF. If new IFF codes and modes are necessary, IFF must be set to NORM, TA or TARA mode.
NAVIGATION	Wait until IOP and MCDUs PBIT finish. MCDU1 starts at FMS1 active page. MCDU2 starts at FMS2 initialization page. By pushing RMS key, RMS will be initialized on RCOM page. Previous parameters, frequencies, channels and selections remain.	

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SYSTEM	AFTER RECOVERY STATE	RECOVERY PROCEDURE
AFCS	Wait until AFCS PBIT finishes. Automatic pilot is disengaged. No Flight Director Mode is selected. HSI selector is in Pilot side selection.	Select desired Flight Director modes and engage Automatic Pilot (if desired).

2. IN-FLIGHT ENGINE START

During in-flight engine starts with cross start, operative engine generator normally maintains the bars over avionic system equipments operative voltage. For that reason avionic systems are not affected.

During in-flight engine starts with battery, the voltage can fall so that, on the most critical situation, all systems can be momentarily lost, except equipments connected to Back-Up Battery.

After the engine start, the system recovery will be produced. The system recovery state will be displayed on the following table. The procedure for recovering the system configuration before engine start is also shown on the table.

NOTE: The amount of lost systems and the duration of the lost, depends on operational margins of each equipment, batteries charge, start duration, whether there is an operative engine and its speed. On the most critical situation, all systems can be momentarily lost, except equipments connected to Back-Up Battery.

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SYSTEM	AFTER RECOVERY STATE	RECOVERY PROCEDURE
EFIS	Wait until IOP PBIT finishes. Lost displays (Pilot ND, co-pilot PFD and co-pilot ND) will not pass PBIT. Pilot PFD primary parameters of Attitude, Heading, Altitude and speed remain, but other preselected parameters will be lost (except FMS1 Navigation). Displays parameters by default: • **DH** –1ft (non-displayed) • **Speed bugs** 49 kts (non-displayed) • **Barocorrection** Last selection • **Selected Altitude** 0 ft • **Selected Heading** 0º (North) • **Selected Course** FMS DTK (Pilot) VOR/LOC 0º (North) (Co-pilot) • **Navigation System** FMS1 (Pilot), VOR/LOC2 (Co-pilot) • **Bearing Pointer-1** ADF1 (Pilot) VOR1 (Co-pilot) • **Bearing Pointer-2** VOR2 (Pilot) TACAN o ADF2 o ADF1 (Co-pilot) (depending on the installed equipment) • **Navigation Display:** Rose, Heading-up, WX OFF, MAP, TCAS AUTO.	Desired values must be selected again
IRS/GPS	IRS/GPS1 maintain the navigation mode. IRS/GPS2 initiates automatically a flight alignment procedure. When completed (10-15 minutes), inertial data is available on FMS2. GPS2 is normally recovered after the new satellites acquisition.	
COMUNICATIONS	Wait until IOP and MCDUs PBIT finish. MCDU1 starts at FMS1 active page.. MCDU2 starts at FMS2 initialization page. By pushing RMS key, RMS will be initialized on RCOM page. Previous parameters, frequencies, channels and selections remain. IFF is the only exception. It starts by default with IFF1 in STANDBY mode to avoid the transmission of undesired codes or modes. Previous modes and codes remain.	Select the desired IFF. If new IFF codes and modes are necessary, IFF must be set to NORM, TA or TARA mode.

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SYSTEM	AFTER RECOVERY STATE	RECOVERY PROCEDURE
NAVIGATION	Wait until IOP and MCDUs PBIT finish. MCDU1 starts at FMS1 active page. MCDU2 starts at FMS2 initialization page. By pushing RMS key, RMS will be initialized on RCOM page. Previous parameters, frequencies, channels and selections remain.	
AFCS	Wait until AFCS PBIT finishes. Automatic pilot is disengaged. No Flight Director Mode is selected. HSI selector is in Pilot side selection.	Select desired Flight Director modes and engage Automatic Pilot (if desired).

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