

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

May 13, 2022

Attachment 8 – AirNet II Training PowerPoint [Excerpts]

OPERATIONAL FACTORS

CEN22FA096



CRM AND SRM – MODULE 401

REFERENCE:AC NO: 120-51C

WHY RESOURCE MANAGEMENT?



At AirNet II you will be operating both as a Learjet crew member and a single pilot in the Baron, which both require effective use of resource management



This module will further inform AirNet II pilots on how to optimize the human/machine factor while operating all company aircraft

CRM training has been conceived to prevent aviation accidents by improving crew performance through better crew coordination.



Outside of the pilot(s), resource management training has now extended to include flight operations personnel, maintenance personnel, and other outlets to create a large support system for the pilot(s)



COMMUNICATION

- Good communication is the cornerstone of safe commercial crew operations
- Adherence to company SOP's ensures proper content and timing of crew communication
- Many barriers to communication may exist depending on the specific situation and crew
- Clear and concise communication is key in a constantly changing environment such as a flight deck



CREW COMMUNICATION



Standardized crew callouts

Pre departure and pre arrival briefings

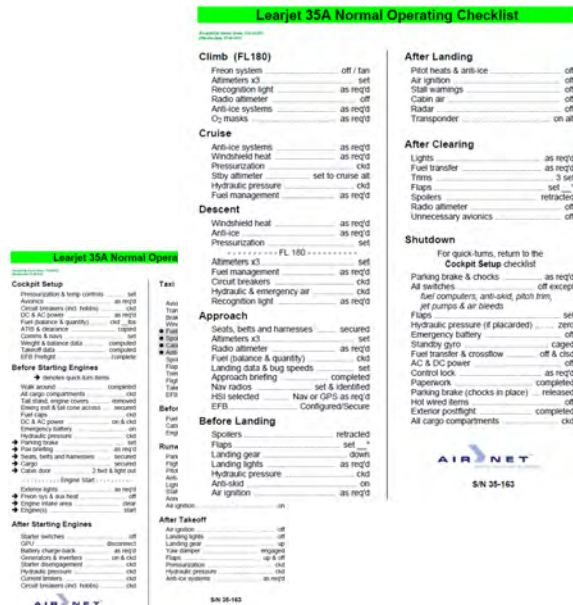
- Normal every day items include initial headings, altitudes, takeoff speeds
- Include any special procedural concerns (special terrain considerations, increased possibility of missed approach)

Clear assignment of pilot duties

- Pilot monitoring vs Pilot flying
- Who is flying? Running checklists? Making radio calls?

Proper use of Checklists

- PM ensuring a response is given for each challenge on a given checklist
- Proper timing of checklists



Note: AirNet II Learjet crew communication SOP's can be located in the Learjet Training Guide on company iPad

BARRIERS TO COMMUNICATION

Internal Barriers

- Speaking skills (nervous speech or language barriers)
- Decision making skills
- Listening skills
- Lack of assertiveness and advocacy

External Barriers

- Rank
- Age
- Gender
- Inadequate company SOP's
- Loud aircraft noise in the Baron, excessive radio chatter on 121.5

OVERCOMING BARRIERS TO COMMUNICATION

- Crew members need to understand the importance of advocacy and inquiry
 - Advocacy – questioning designed to increase someone else's SA
 - Inquiry – questioning designed to increase your own SA
- Crew members need to be assertive
 - Captain can create an environment that encourages assertiveness and input from other crew members
 - Speak up when you see an operational or safety concern (your certificate and life is on the line too)
- Conflict Resolution is key
 - Unless personal conflicts are resolved prior to departure, crew communication will suffer
 - Situation generally occurs with larger companies with larger pilot employment

SINGLE PILOT RESOURCE MANAGEMENT

- In many operations with AirNet II you will operate single pilot PIC in company Baron's
- Operating single pilot IFR is a challenging task especially in adverse conditions
- Single-pilot resource management (SRM) is the art of managing all onboard and outside resources available to a pilot before and during a flight to help ensure a safe and successful outcome
- We will approach SRM practically using 5 factors each pilot should consider for any operation





SINGLE PILOT RESOURCE MANAGEMENT

- **Plan** – Look at the big picture. Consider adverse weather (low ceilings, thunderstorms, ice, etc.). Use ATC as a tool to help plan alternate routes/airports
- **Plane** – Pilot should closely monitor all aircraft systems and be extremely familiar with their operation
- **Pilot** – IMSAFE checklist becomes even more significant
- **Passengers** – Use other company riders (BE58 time builders) to help monitor aircraft and approaches.
- **Programming** – Pilots should be familiar and proficient with autopilot systems and avionics.



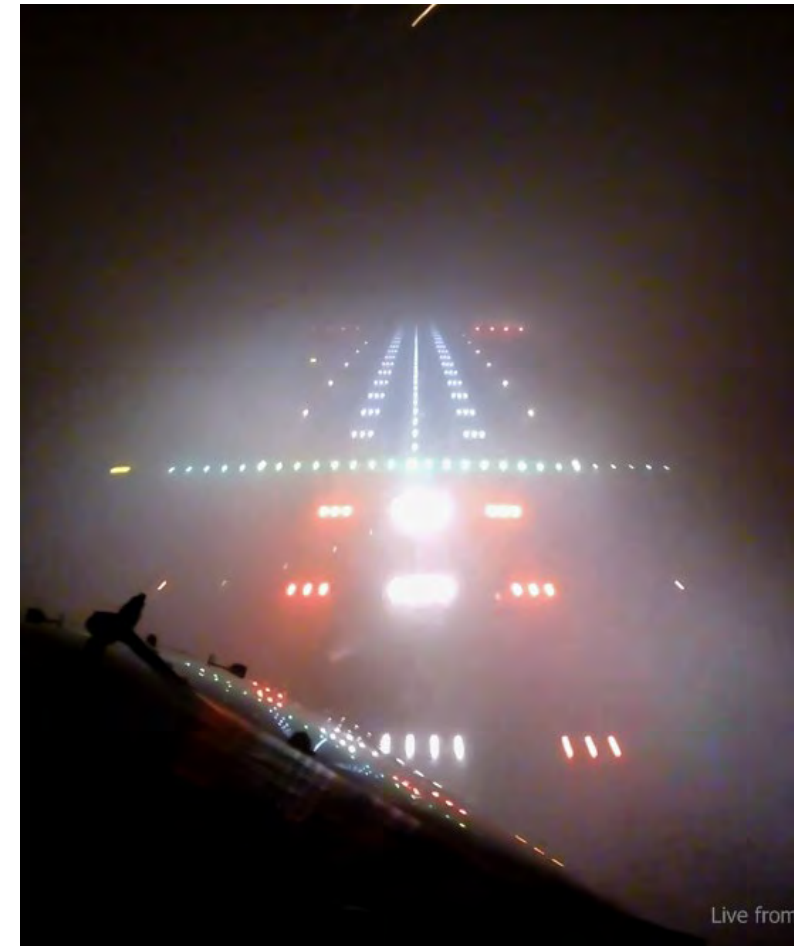
STRESS MANAGEMENT

- Stress is a natural part of any flight operation
- Task saturation, along with many other factors, can cause stress
- The three types of stress are physiological, physical, and psychological



TYPES OF STRESS

Physiological	Hunger/thirst Fatigue Motion Sickness
Physical	Turbulence Noise Hot or cold flight deck
Psychological	High cockpit workload due to weather or airport environment Company environment pressures Personal and emotional conflicts



Live from

DEALING WITH STRESS

Recognize

Know when you and/or your crewmember are becoming overwhelmed

You are more prone to fixation on a stressor which can divert from other duties

Manage

Slow down the aircraft

Use checklists

Use proper preflight preparation

Cope

Train and condition yourself to deal with high stress situations



KFC-200 AUTOPILOT

- THE AUTOPILOT ALLOWS THE AIRCRAFT TO BE CONTROLLED IN BOTH LATERAL AND VERTICAL MODES WITH A COMPLETE TWO AXIS (PITCH AND ROLL WITH ALTITUDE HOLD) CONTROL SYSTEM
- THE KFC 200 AUTOPILOT INCLUDES TWO PANELS
 1. THE CONTROL PANEL BELOW THE PILOT'S INSTRUMENTS
 2. THE ANNUNCIATOR PANEL DIRECTLY ABOVE THE PILOT'S INSTRUMENTS



KFC-200 AUTOPILOT MODES

1. FLIGHT DIRECTOR MODE

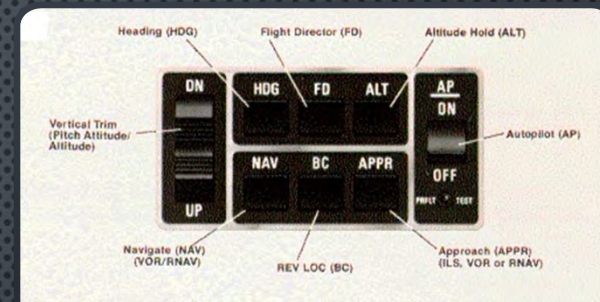
- ADDS COMMAND BARS TO THE ATTITUDE INDICATOR AND CAN BE COUPLED IN AUTOPILOT MODE OR AIRCRAFT CAN BE HAND FLOWN WITH THE COMMAND BARS ONLY

2. AUTOPILOT MODE

- ENGAGES SERVOS AND ENABLES CONTROL SURFACES TO RESPOND TO ALL SELECTED FLIGHT DIRECTOR MODES

KFC-200 FLIGHT DIRECTOR COMMONLY USED MODES

- HDG
 - AIRCRAFT WILL FLY HEADING SELECTED WITH HEADING BUG ON PILOT'S HSI
- NAV
 - AIRCRAFT WILL COUPLE WITH SELECTED NAV1 CDI SOURCE (LOC/VOR/GPS) AND TRACK A COURSE
- APPR
 - WILL COUPLE WITH NAV1 CDI FOR APPROACHES FOR BOTH LATERAL AND VERTICAL GUIDANCE (IF APPLICABLE)
- ALT
 - WILL HOLD ALTITUDE THAT IT WAS ENGAGED AT
 - THE DN/UP SWITCH ON THE FAR LEFT OF THE CONTROL PANEL ALLOWS FOR ALTITUDE ADJUSTMENTS WITHOUT DISABLING THE ALT MODE ON THE AP





KFC200 ENGAGEMENT/DISENGAGEMENT

- TO ENGAGE THE AUTOPILOT, SIMPLY SELECT THE DESIRED VERTICAL AND LATERAL MODES THEN FLIP THE AUTOPILOT SWITCH TO THE ON POSITION
- THE AP CAN BE MANUALLY DISENGAGED IN ONE OF THE FOLLOWING WAYS
 - DEPRESSING THE CONTROL WHEEL MASTER SWITCH
 - SWITCHING THE AUTOPILOT CONTROL SWITCH TO THE OFF POSITION
 - TRIMMING THE AIRPLANE ELECTRICALLY USING THE YOKE TRIM SWITCH



GARMIN GFC600 AUTOPILOT



- JUST LIKE THE KFC200, THE GFC600 AUTOPILOT HAS A CONTROL PANEL AND ANNUNCIATOR PANEL
- THE GFC 600 INCLUDES ALL THE SAME FUNCTIONS AS THE KFC200 BUT WITH INCREASED ACCURACY
- THE GFC600 ALSO FEATURES ADDITIONAL FUNCTIONS SUCH AS VNAV, IAS, AND VS MODES

GFC600 DIFFERENCES



- TO ENGAGE THE AUTOPILOT, DEPRESS THE AP BUTTON ON THE LEFT SIDE OF THE CONTROL UNIT THEN SELECT DESIRED VERTICAL AND LATERAL SETTINGS
- DISENGAGEMENT OF THE AUTOPILOT IS THE SAME AS WITH THE KFC200
- THE SYSTEM ALSO INCLUDES A “LVL” KEY THAT LEVELS BOTH ROLL AND PITCH ATTITUDES WHEN DEPRESSED
- THE “NOSE Up/Dn” KEY ADJUSTS THE VERTICAL MODE REFERENCE IN PITCH HOLD, VERTICAL SPEED, AND ALTITUDE HOLD MODES
- THE AUTOPILOT ALSO GOES THROUGH A SELF TEST FEATURE UPON EVERY START UP TO ENSURE PROPER OPERATION

AUTOPILOT USE FAR 135.93

- TAKEOFF AND INITIAL CLIMB
 - NO PERSON MAY USE AN AUTOPILOT FOR TAKEOFF OR INITIAL CLIMB BELOW THE HIGHER OF 500 FEET OR AN ALTITUDE THAT IS NO LOWER THAN TWICE THE ALTITUDE LOSS SPECIFIED IN THE AIRPLANE FLIGHT MANUAL (AFM).
- ENROUTE
 - NO PERSON MAY USE AN AUTOPILOT ENROUTE, INCLUDING CLIMB AND DESCENT, BELOW 500 FEET OR AT AN ALTITUDE THAT IS NO LOWER THAN TWICE THE ALTITUDE LOSS SPECIFIED IN THE AFM FOR AN AUTOPILOT IN CRUISE CONDITION.
- APPROACH
 - NO PERSON MAY USE AN AUTOPILOT AT AN ALTITUDE LOWER THAN 50 FEET BELOW THE DA/H¹ OR MDA FOR THE INSTRUMENT PROCEDURE BEING FLOWN, EXCEPT AS FOLLOWS:
 - FOR AUTOPILOTS WITH AN AFM SPECIFIED ALTITUDE LOSS FOR APPROACH OPERATIONS, AN ALTITUDE NO LOWER THAN TWICE THE SPECIFIED ALTITUDE LOSS IF HIGHER THAN 50 FEET BELOW THE MDA OR DA/H¹.



ANII BE58 AUTOPILOT USE AFM SUPPLEMENTS

- KFC-200
 - AFM PRESCRIBES ALTITUDE LOSS FOR EACH AP SETTING TO BE USED IN CONJUNCTION WITH FAR135.93

F. Maximum Altitude losses due to autopilot malfunction:	
<u>Configuration</u>	<u>Alt Loss</u>
Cruise, Climb, Descent	400'
Maneuvering	100'
APPR	40'
SE APPR	40'

- GFC-600
 - AFM EXPLICITLY ASSIGNS ALTITUDES FOR AP USE

Autopilot maximum engagement speed is 213 KIAS (245 MPH).

Autopilot minimum engagement speed is 90 KIAS (104 MPH).

The autopilot must be disengaged below 200 feet AGL during approach operations and below 800 feet AGL during all other operations.

AUTOPILOT MALFUNCTIONS



- DURING AN UNSCHEDULED AUTOPILOT PITCH OR ROLL INPUT THERE ARE STEPS THAT NEED TO BE TAKEN TO DISCONNECT THE AUTOPILOT AND REGAIN AIRCRAFT CONTROL
 1. FIRMLY GRASP THE CONTROL WHEEL
 2. PRESS AND HOLD THE AUTOPILOT/TRIM DISCONNECT
 3. RETRIM THE AIRCRAFT AS NEEDED
 4. PULL THE AP AND TRIM CIRCUIT BREAKERS
 5. RELEASE THE AP/TRIM DISCONNECT

GARMIN GTR225 COMM/NAV RADIOS

- ALL AIRNET II BE58 AIRCRAFT ARE EQUIPPED WITH 1 OR 2 GTR225 NAV/COMM RADIOS DEPENDING ON THE TYPE OF GPS INSTALLED
- THIS ALLOWS FOR A DUAL COMM AND NAV SYSTEM IN EVERY AIRPLANE FOR REDUNDANCY AND EASE OF USE FOR PILOTS

