






<div><div><div>ПУЛКОВО</div><div><div></div><div>PULKOVO</div></div></div></div>		MINIMUM EQUIPMENT LIST			
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1. ITEM		2.Number installed			
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		4.Remarks or exceptions			
34. NAVIGATION					
1.Mach/Airspeed Indications					
1) Mach Indications	C	2	1	One may be inoperative provided one Mach/Airspeed warning and Mach trim system operates normally.	
a) (-500)	C	2	0	May be inoperative provided : a) Airplane remains at or below FL 230, and b) Airspeed remains at or below 320 KIAS.	
b) (-600/-700/-800/-900)				Not Applicable	
2) Airspeed Cursor (-500)	A	2	1	(O) One may be inoperative provided : a) Alternate procedures are established and used, and b) Repairs are made within three flight days.	
3) External Airspeed Markers (Bugs) (-500)	C	5	0	(O) May be inoperative or missing provided alternate procedures are established and used.	
4) Digital Airspeed Readout (-500)				Not Applicable	
5) Air data computer	A	2	1	(M) (O) One may be inoperative provided: a) Not required by FAR b) System is deactivated and secured	
		2	2	<u>For RVSM operations.</u>	
				<u>Alternate Procedures:</u> Flight crew must be aware of airplane configuration, altitude and flight path. Flight crew must use all airplane systems available (autopilot, autoland, ILS, FMCS) and review Minimum Enroute Altitudes (MEA's) and altitude call outs. Flight crew must be careful	


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				about airspeed limits, altitude limits, minimum safe altitudes.
2. Mach/Airspeed Warning Systems				
1) Maximum Operating Speed Indication	C	2	1	One may be inoperative provided the clacker warning system operates normally and is independent from the Mach Indicator.
2) Clacker				
a) (-100/-200)				Not applicable
b) (-500)	C	2	1	
	B	2	0	Systems may be inoperative provided: a) Both Mach indicators operate normally, b) 330 KIAS/.76 Mach airspeed limitations are observed, and c) If the overspeed warning occurs earlier than scheduled during flight, speed must remain below the point at which the warning occurs.
	B	2	0	Systems may be inoperative provided: a) Both Mach indicators operate normally, b) 330 KIAS/.76 Mach airspeed limitations are observed, and c) If the overspeed warning occurs below .76 Mach, the system must be deactivated by pulling the associated circuit breaker and observe speed limits.
3. Altimeter Vibrators				
1) Servo Pneumatic	C	2	1	One may be inoperative provided associated air data computer operates normally.
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2) Pneumatic					Not Applicable
3) Pneumatic (With Electric/Electronic Altimeter					Not Applicable
4) One Pneumatic and one Servo-Pneumatic					Not Applicable
5) Standby Altimeter Vibrator (With Electric / Electronic Altimeter)		C	1	0	May be inoperative provided VMC exist at departure and arrival airports.
4. Static Air Temperature Indication					Not Applicable
5. Total Air Temperature Indication		C	1	0	May be inoperative provided an alternate air temperature indication (e.g. PDCS, FMCS, RAT, SAT) operates normally.
6. Attitude Director Indicators (ADI)					Deleted prior to MMEL Rev, 27.
7. Standby Horizon Indicator					
1) Standby Attitude Indicator		B	1	0	May be inoperative provided: a) Operations are conducted in Day VMC only, and b) Operations are not conducted into known or forecast Over-The-Top conditions.
2) ILS Indication		D	1	0	
8. Angle of Attack Indications					Not Applicable


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9. Turn and Bank Indicators					
1) Rate of Turn Indicators	C	2	1		
	C	2	0		May be inoperative provided Standby Horizon indicator operates normally.
10. Directional Gyro Compass System					Deleted prior to MMEL Rev.27.
11. Non-Stabilized Magnetic Compass	B	1	0		(O) May be inoperative provided any combination of three gyro or INS (IRU) stabilized compass systems are operative.
	B	1	0		(O) May be inoperative provided : a) Any combination of two gyro or INS (IRU) stabilized compass systems are operative, and b) Airplane is operated with dual independent navigation capability, and under positive radar control by ATC on the enroute portion of the flight.
	C	1	0		(O) May be inoperative for flights that are entirely within areas of magnetic unreliability provided two stabilized directional gyro systems are installed, operative, and used in conjunction with free gyro navigation techniques.
12. Flight Director Systems	C	2	0		May be inoperative provided approach minimums do not require its use.
13. Distance Measuring Equipment Systems		2	2		Both must be operative where navigation is based only on DME signals.


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	D	2	1	One may be inoperative provided that; - One VOR Receiving System AND - One ADF System AND - One Marker Beacon Receiving System is fully operative.	
14. Marker Beacon Receiver System	C	1	0	May be inoperative provided approach minimums do not require its use.	
15. Weather Radar		1	1		
	D	1	0	May be inoperative; if the airplane is not being operated at night or in instrument meteorological conditions in areas where thunderstorms or other potentially hazardous weather conditions, regarded as detectable with airborne weather radar, may be expected to exist along the route.	
1) Windshear Detection and Avoidance System				Not applicable	
2) Autotilt Function (STC ST01843AT, STC ST01470LA-D)				Not applicable	
				<u>Alternate Procedures:</u> Flight crew must be aware of airplane configuration, altitude and flight path. Flight crew must use all airplane systems available (autopilot, autoland, ILS, FMCS) and review Minimum Enroute Altitudes (MEA's) and altitude call outs. Flight crew must be careful about airspeed limits, altitude limits, minimum safe altitudes.	
16. Radio Compass Systems (ADF)		2	2	Both must be operative for routes where navigation is based only on NDB signals.	
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	D	2	1 One may be inoperative provided that; - One VOR Receiving System AND - One DME System AND - One Marker Beacon Receiving System is fully operative.
	D	2	0 If navigation is <u>not</u> based only on NDB signals, both may be inoperative provided that; -Both VOR Receiving System AND -Both DME System AND -One Marker Beacon Receiving System is fully operative.
17. VHF Navigation Systems (VOR/ILS)			
1) (-500)		2	2 Both must be operative for routes where navigation is based only on VOR signals.
	D	2	1 Otherwise, one may be inoperative, provided that; - Approach minimums do not require its use AND - One ADF System AND - One DME System AND - One Marker Beacon Receiving System is fully operative.
		2	2 <u>For CAT II operations</u> <u>Note:</u> Displayed on both CRTs.
2) (-500) (GNLU-920 MMR,			Not applicable
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STC ST00998LA-D)				
3) (-600/-700/-800/-900)				Not applicable
18. ATC Transponders and Automatic Altitude Reporting Systems	B	2	0	May be inoperative provided: a) Enroute operations do not require its use, and b) Prior to flight, approval is obtained from ATC facilities having jurisdiction over the planned route of flight.
	D	2	1	<u>For RVSM operations.</u>
19. Instrument Comparator or Warning System				Not applicable
20. Radio Altimeter Systems				
1) Receiver /Transmitters		2	2	<u>For CAT II and CAT IIIa operations.</u> Displayed on both DU's.
				Not applicable
a) (-100/-200)				
b) (-500)	C	2	1	(M)(O) One may be inoperative deactivated provided: a) approach minimums or operating procedures do not require its use, and b) GPWS operates normally.
	A	2	1	(M)(O) One may be inoperative deactivated provided: a) approach minimums or operating procedures do not require its use, and b) Repairs are made within two flight days.
c) (-600/-700/-800/-900)				Not applicable


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2) Indications	C	2	0	(M) (O) May be inoperative provided: a) Associated receiver/transmitter is verified to operate normally, and b) Approach minimums or operating procedures do not require its use.	
21. Air Data System (Non Electric Airspeed Indicators)				Not applicable	
22. Alternate Static System (-100/-200)				Not Applicable	
23. True Airspeed Indication	C	2	0		
24. Airspeed Indicators (-500)	C	2	1	One may be inoperative provided: a) EFIS Speed Tape displays are installed and operate normally, and b) One Mach/Airspeed warning operates normally.	
25. Altitude Alerting System	A	1	0	(O) May be inoperative provided : a) Autopilot with altitude hold is operative, b) Enroute operations do not require its use, and b) Repairs are made within three flight days.	
		1	1	<u>For RVSM operations.</u>	
26. Ground Proximity Warning System (GPWS)	A	1	0	(O) May be inoperative provided: a) Alternate procedures are established and used, and b) Repairs are made within two flight days.	
1) Modes 1 Thru 4	A	1	0	(O) May be inoperative provided: a) Alternate procedures are established and used, and b) Repairs are made within two flight days.	

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2) Test Mode		A	1	0	(O) May be inoperative provided: a) GPWS is considered inoperative, and b) Repairs are made within two flight days.
3) Glideslope Deviation (Mode 5)		B	2	0	
4) Advisory Callouts		C	1	0	(O) May be inoperative provided alternate procedures are established and used.
			1	1	<u>For CAT IIIa operations</u>
5) Windshear Warning and Flight Guidance System (Windshear Mode)		C	1	0	(O) May be inoperative provided: a) Alternate procedures are established and used, and b) Windshear Detection and Avoidance System operates normally
6) TAWS		C	1	0	
			1	1	<u>For CAT IIIa operations.</u> Alternate Procedures: Flight crew must be aware of airplane configuration, altitude and flight path. Flight crew must use all airplane systems available(autopilot, autoland, ILS,FMCS) and review Minimum Enroute Altitudes (MEA's) and altitude call outs. Flight crew must be careful about airspeed limits, altitude limits, minimum safe altitudes.
27. Long Range Navigation Systems (INS, Loran, Omega)					Not applicable
28. Performance Data Computer System (PDCS)					Not applicable
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29. Speed Command (Fast-Slow) Indicators (-500)			Not applicable	
30. ADI Test (-400)			Not applicable	
31. Speed Cursor Remote Drive			Not applicable	
32. Instrument Transfer Switching System	C	1 0	(O) May be inoperative provided: a) Associated instruments operate normally from isolated sources, and b) Inoperative switches are not moved during flight.	
33. Vertical Gyro System			Not applicable	
34. Standby Altimeter Vibrator			Moved to Item 34-3 prior to MMEL Rev.30.	
35. Inertial Reference System(s) (IRS)			(O) One may be inoperative provided : a) Remaining IRS operates normally and is used for both Attitude Indications and both HSIs, b) Flight is restricted to day VMC, c) Standby Magnetic Compass operates normally. d) Standby Horizon Indicator operates normally, e) Both Vertical Speed indications are switched to remaining IRS, if required, and f) Autopilots (any mode) are not used.	
1) IRS Data Display (Aft Overhead Panel)	C	1 0	May be inoperative provided one FMCS CDU operates normally.	

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2) IRS Ground Crew Call Horn		C	1	0	
36. Flight Management Computer System (FMCS)					
1) (-200 STC ST01676AT)					Not applicable
2) (-500)					
a) FMC Alert Lights		C	2	1	One may be inoperative provided the FMC is not used for autopilot guidance during the approach.
		C	2	0	May be inoperative provided the FMC is not used for autopilot guidance.
b) Computer			1	1	<u>For MNPS and B-RNAV operations.</u>
1) (-500)		C	1	0	May be inoperative provided : a) IRS display unit (on aft overhead panel) operates normally, and b) EFIS speed tapes are not used as primary airspeed indicators.
2) (-600/-700/-800/-900)					Not applicable
c) CDU / MCDU		C	2	0	May be inoperative provided IRS data display unit (on aft overhead panel) operates normally.
		C	2	1	<u>For MNPS and B-RNAV operations.</u>
d) Alternate Navigation Control Display Unit					Not Applicable

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(ANCDU)					
e) Navigation Databases	C	-	-		(O) May be out of currency provided : a) Current Aeronautical Charts are used to Navigation Fixes prior to dispatch, b) Procedures are established and used to verify status and suitability of Navigation Facilities used to define route of flight, and c) Approach Navigation Radios are manually tuned and identified.
37. Windshear Warning and Flight Guidance System					Not Applicable
38. Pitch Limit Indication (PLI)	C	2	0		
39. EFIS Speed Tape (-500)	C	2	0		May be inoperative provided airspeed indicators are installed and operating normally at each pilot's station.
40. Traffic Collision and Avoidance System (TCAS)	B	1	0		(M) (O) May be inoperative provided: a) System is deactivated and secured, and b) Enroute or approach procedures do not require its use.
	C	1	0		(M) (O) May be inoperative provided: a) Not required by FAR b) System is deactivated and secured, and c) Enroute or approach procedures do not require its use.
1) TCAS computer		1	1		<u>For MNPS and B-RNAV operations.</u>
2) Combined Traffic Alert (TA) and Resolution Advisory (RA) Dual Display	C	2	1		May be inoperative on the non-flying pilot side provided : a) TA and RA visual display is operative on the flying pilot side, and

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2) Resolution Advisory (RA) Display System(s)	C	2	1	b) TA and RA audio function is operative on the flying pilot side.
	C	2	0	(O) May be inoperative provided : a) Traffic Alert (TA) visual display and audio functions are operative, b) TA only mode is selected by the crew, and c) Flight Operations Department must ensure that the enroute and/or approach procedures for that flight do not require its use.
	C	2	0	(O) May be inoperative provided : a) RA visual display and audio functions are operative, and b) Flight Operations Department must ensure that the enroute and/or approach procedures for that flight do not require its use.
41. Engine Pressure Ratio Limit System (EPRL)				Not Applicable
42. Radio Magnetic Indicators (RMI)				
1) (-500)	C	2	1	
2) (-600/-700/-800/-900)				Not Applicable
43. Radio Height Alert	D	2	0	
44. Head-Up Display System (HUD)				Not Applicable
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45. Global Positioning System (GPS)					Not Applicable
46. Microwave Landing System (MLS)					Not Applicable
47. ILS Beam Deviation Lights					Not Applicable
48. EFIS Control Panel Map Switches					
1) (-500)	C	2	1		
a) VOR/ADF	C	2	1		
b) NAV AID	C	2	1		
c) ARPT	C	2	1		
d) RTE DATA	C	2	1		
e) WPT	C	2	1		
2) (-600/-700/-800/-900)					Not Applicable
49. Right IRS DC Power Supply System	B	1	0		(O) May be inoperative provided: a) Remaining IRS Mode Selector Unit lights are not illuminated, and b) Autopilot dual channel mode is not used during approach.
50. ILS System (-600/-700/-800/-900)					Deleted in MMEL Rev. 37, relief incorporated into Item 34-56.

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51. Metric Altimeter	D	1	0	Not Applicable
52. Performance Management System (PMS) with Windshear Detection/Alerting System (STC SA2018NM)				Not Applicable
53. Automatic Dependent Surveillance-Broadcast (ADS-B) System				Not Applicable
54. Integrated Standby Flight Instrument (ISFD) System				Not Applicable
55. Vertical Situation Display (VSD) System				Not Applicable
56. Multi Mode Receiver (MMR)				Not Applicable