

**BY ORDER OF THE COMMANDER  
AIR FOR MATERIEL COMMAND**



**AIR FORCE INSTRUCTION 21-103**

**AIR FORCE MATERIEL COMMAND  
Supplement  
ADDENDUM\_K**

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**Maintenance**

**EQUIPMENT INVENTORY, STATUS AND  
UTILIZATION REPORTING SYSTEM/CH-  
130E/H/H2/H3 MINIMUM ESSENTIAL  
SUBSYSTEM LIST (MESL)**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This instruction implements AFD 21-1, *Air and Space Maintenance*, AFI 21-101, *Aircraft and Equipment Maintenance Management*, and AFI 21-103, *Equipment Inventory, Status and Utilization Reporting*. It establishes policy and assigns responsibility to provide AFMC Test Fleet aircraft status changes/updates in accordance with (IAW) current maintenance conditions and the developed MDS specific mission essential subsystem list (MESL). This instruction applies to all AFMC organizations that manage or perform maintenance on AFMC owned/possessed aircraft regardless of Air Force Specialty Code. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW AFMAN 33-363, *Management of Records*, and disposed of IAW the Air Force Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afirms/afirms/afirms/rims.cfm>. Send comments and suggested improvements to this instruction on AF Form 847, *Recommendation for Change of Publication*, to HQ AFMC/A4MM, 462 Chidlaw Road, Wright-Patterson AFB OH 45433-5006.

These MESLs complement AFI 21-103, *Equipment Inventory, Status, and Utilization Reporting*. They apply to maintenance activities supporting AFMC test missions across AFMC.

1. General. The MESL is the basis of status reporting IAW 21-103. MESLs lay the ground work for reporting the status of assigned/possessed AFMC test fleet aircraft and equipment

supporting AFMC test missions. They list the minimum essential systems and subsystems that must work on test fleet aircraft to perform specifically assigned unit test, training or other missions.

1.1. Qualifying notes are used to define system exceptions and help explain complex degraded mission systems.

1.2. It is understood that any aircraft or support equipment system or subsystem may be subjected to test or tested under a test scenario and/or are test dependent as directed by the test mission director. If identified by test mission director, those systems or subsystems if not already identified by qualifying notes must be operational to be considered FMC or PMC for that mission.

2. Reading the MESL. A MESL is read by comparing the systems stated by WUC or UNS column (column 2) against the Full Systems List (FSL) and all applicable Basic Systems List (BSLs) across the page (DTE - Developmental Test and Evaluation, DTS - Developmental Test Support, TNG - Training). Each unit's Design Operational Capability (DOC) statement determines applicability of BSL columns. The aircraft or equipment MESLs incorporate all AFMC assigned/possessed aircraft/equipment and therefore it is important to compare only the columns listed in the MESL which are applicable to the units assigned/possessed aircraft. For example, units with training (TF) coded aircraft would determine report status using only the FSL and TNG columns. Units with multiple coded aircraft will ensure status is reported using the MESL columns appropriate to the individual aircraft/equipment assignment code or type mission being flown.

#### NC/C-130E/H/H2/H3 MINIMUM ESSENTIAL SUBSYSTEM LISTING (MESL)

NO.	WUC	SYSTEM/SUBSYSTEM	FSL	BSL		
				DTE	DTS	TNG
1.	11000	Airframe	X	X	X	X
2.	11000	Crew Door	X	X	X	X
3.	11000	Crew Door Warning Light	X	X	X	X
4.	11000	Paratroop Door	X	X	X	X
5.	11000	Ramp and Ramp Locking System	X	X2	X2	X2
6.	11000	Aft Cargo Door and Locking System	X	X2	X2	X2
7.	11000	Fuselage	X	X	X	X
8.	11000	Wings and Nacelles	X	X	X	X
9.	11000	Empennage	X	X	X	X
10.	12500	Aft Cargo Compartment	X	X2	X2	X2
11.	13000	Landing Gear	X	X	X	X
12.	13000	Landing Gear Position Indicators	X	X	X	X
13.	13000	Landing Gear Warning Light	X	X	X	X
14.	13000	Brakes	X	X	X	X
15.	13000	Wheel Brakes	X	X	X	X
16.	13000	Anti-Skid	X	X	X	X
17.	13000	Parking Brake	X	X	X	X
18.	14000	Flight Controls	X	X	X	X

19.	14000	Control Surface Position Indicator	X	X	X	X
20.	22000	Turboprop Powerplants	X	X	X	X
21.	22000	Torque meter	X	X	X	X
22.	22000	Tachometer	X	X	X	X
23.	22000	Turbine Inlet Temperature Indicators	X	X	X	X
24.	22000	Fuel Flow Gauges	X	X	X	X
25.	22000	Oil Temperature Gauges	X	X	X	X
26.	22000	Oil Pressure Gauges	X	X	X	X
27.	22000	Oil Quantity Gauges	X	X3	X3	X3
28.	22000	Low Oil Quantity Light	X	X4	X4	X4
29.	22000	Oil Cooler Flap	X	X5	X5	X5
30.	22000	Auxiliary Power Unit	X	X6	X6	X6
31.	24000	Gas Turbine Compressor	X	X	X	X
32.	24000	Air Turbine Motor (ATM)	X	X	X	X
33.	24000	Cooling Fan	X	X	X	X
34.	32000	Hydro Propellers	X	X7	X7	X7
35.	32000	Synchrophaser	X	X	X	X
36.	41000	Air Conditioning/Pressurization	X	X8	X8	X8
37.	41000	AC-Flt Compartment	X	X8	X8	X8
38.	41000	Flight Deck Auxiliary Vent Valve	X	X	X	X
39.	41000	Flight Deck Temperature Control System	X	X9	X9	X9
40.	41000	AC-Cargo Compartment	X	X8	X8	X8
41.	41000	Cargo Compartment Auxiliary Vent Valve	X	X	X	X
42.	41000	Cargo Compartment /Temp Control System	X	X9	X9	X9
43.	41000	Under Floor Heat System	X	X	X	X
44.	41000	Cabin Pressure Controller	X	X10	X10	X10
45.	41000	Emergency Depressurization Switch	X	X	X	X
46.	41000	Bleed Air System	X	X	X	X
47.	41000	Anti-Ice/De-Ice Systems	X	X	X	X
48.	41000	Ice Detection System	X	X11	X11	X11
49.	41000	Pitot Heat System	X	X	X	X
50.	41000	TAS Probe Heat	X	X	X	X
51.	41000	Wing/Empennage Anti-Icing System	X	X11	X11	X11
52.	41000	Engine Inlet Air Duct Anti-Icing Systems	X	X11	X11	X11
53.	41000	Leading Edge Temperature Indicators	X	X	X	X
54.	41000	Wing Leading Edge and Wheel Well Over temperature Warning Lights	X	X	X	X
55.	41000	Propeller Anti-Icing System	X	X11	X11	X11
56.	41000	Windshield Anti-Icing Systems	X	X11	X11	X11
57.	41000	Radome Anti-Icing System	X	X12	X12	X2
58.	41000	Instruments	X	X	X	X
59.	41000	Cabin Altimeter	X	X10	X10	X10
60.	41000	Cabin Differential Pressure Indicator	X	X10	X10	X10
61.	41000	Cabin Rate-of-Climb Indicator	X	X10	X10	X10

62.	42000	Electrical Power Supply	X	X	X	X
63.	42000	Engine-Driven Generators	X	X	X	X
64.	42000	Bus Switching System (BSS)	X	X	X	X
65.	42000	Bus Switching Unit (BSU)	X	X13	X13	X13
66.	42000	Transformer/Rectifiers (TR)	X	X14	X14	X14
67.	42000	ATM/APU Generator	X	X6	X6	X6
68.	42000	Generator Out Lights	X	X15	X15	X15
69.	42000	AC Load Meter	X	X15	X15	X15
70.	44000	Navigation Lights	X	X16	X16	X16
71.	44000	Landing Lights	X	X18	X18	X18
72.	44000	Taxi Lights	X	X19	X19	X19
73.	44000	Wing Leading Edge Lights	X	X	X	X
74.	44000	Formation Lights	X	X17	X17	X17
75.	44000	Strobe (Anti-Collision) Light System	X	X	X	X
76.	44000	Pedestal/Pilots Side Panel Lights	X	X20	X20	X20
77.	44000	Panel Lights	X	X20	X20	X20
78.	44000	Warning Lights	X	X20	X20	X20
79.	44000	Emergency Exit Lights	X	X	X	X
80.	45000	Hydraulic and Pneumatic Power Supply	X	X	X	X
81.	45000	Engine Driven Hydraulic Pumps	X	X	X	X
82.	45000	Utility/Booster System Engine Pump Pressure Warning Lights	X	X	X	X
83.	45000	Utility System Hydraulic Pressure Indicator	X	X	X	X
84.	45000	Booster System Hydraulic Pressure Indicator	X	X	X	X
85.	45000	Hydraulic Suction Boost Pump	X	X	X	X
86.	45000	Auxiliary Hydraulic Pump	X	X	X	X
87.	45000	Auxiliary Hydraulic Pressure Indicator	X	X	X	X
88.	45000	Rudder Boost Pressure Indicator	X	X21	X21	X21
89.	46000	UARRSI	X	X	X	X
90.	46000	Fuel Tanks	X	X	X	X
91.	46000	SPR Dual Level Control	X	X	X	X
92.	46000	Fuel System Instruments	X	X	X	X
93.	46000	Main Tank Fuel Pumps	X	X	X	X
94.	46000	Main Tank Dump Pumps	X	X	X	X
95.	46000	Auxiliary Tank Fuel Pumps	X	X	X	X
96.	46000	External Tank Fuel Pumps	X	X22	X22	X22
97.	46000	Main Fuel Quantity Indicators	X	X23	X23	X23
98.	46000	Auxiliary Tank Fuel Quantity Indicators	X	X	X	X
99.	47000	Oxygen System	X	X	X	X
100.	49000	Miscellaneous Utilities	X	X	X	X
100a.	49000	Test Specific Miscellaneous Utilities	X	X1	X1	X1
101.	49000	Engine Fire/Turbine Overheat Warning Sys	X	X	X	X
102.	49000	Nacelle Overheat Systems	X	X	X	X
103.	49000	GTC/APU Fire Warning System	X	X	X	X

104.	49000	Windshield Wipers	X	X	X	X
105.	49000	Personnel Warning Bell	X	X	X	X
106.	51000	Sextant	X	X	X	X
107.	51000	Pitot Static System	X	X	X	X
108.	51000	Turn and Slip Indicating System	X	X	X	X
109.	51000	Attitude Director Indicating System	X	X	X	X
110.	51000	Standby ADI	X	X	X	X
111.	51000	Navigation Instruments	X	X	X	X
112.	51000	TCAS	X	X25	X25	X25
113.	51000	Flight Director System	X	X	X	X
114.	51000	Horizontal Situation Indicators	X	X	X	X
115.	51000	Standby Magnetic Compass	X	X	X	X
116.	51000	EFI Displays	X	X	X	X
117.	51000	BDHI	X	X		
118.	51000	Barometric Altimeters	X	X24	X24	X24
119.	51000	Heading Systems	X	X25	X25	X25
120.	51000	GPWS	X	X25	X25	X25
121.	51000	GCAS	X	X25	X25	X25
122.	51000	Central Air Data Computer	X	X	X	X
123.	51000	Nav Selector Panel	X	X	X	X
124.	51000	Airspeed Indicator	X	X	X	X
125.	51000	Vertical Velocity Indicator	X	X30	X30	X30
126.	51000	NDB	X	X	X	X
127.	52200	N-1 Compass System	X	X	X	X
128.	56A00	Cockpit Voice Recorder	X	X	X	X
129.	56B00	Flight Data Recorder	X	X	X	X
130.	61500	HF	X	X1	X1	X1
131.	61600	ANDVT	X	X	X	X
132.	62X00	VHF	X	X	X	X
133.	63M00	UHF	X	X	X	X
134.	63000	#1 UHF Manual Control Head Radio (SCNS Only)	X	X	X	X
135.	64200	Intercom System	X	X		
136.	65000	IFF/SIF	X	X	X	X
137.	66000	Emergency Communications	X	X	X	X
138.	66000	Emergency Locator Transmitter	X	X	X	X
139.	66300	Underwater Acoustic Locator System	X	X	X	X
140.	69210	Radio Direction Finder	X	X	X	X
141.	69600	KY-58 Secure Voice	X	X		
142.	71C00	VOR	X	X	X	X
143.	71F00	Global Positioning System	X	X	X	X
144.	71GA0	IDCO	X	X26	X26	X26
145.	71GB0	BICU	X	X	X	X
146.	71GEO	RLG INU	X	X	X	X

147.	71J00	Microwave Landing System	X	X27	X27	X27
148.	71000	Instrument Landing System	X	X27	X27	X27
149.	71Z00	TACAN (AN/ARN-118)	X	X	X	X
150.	71100	Radio Compass	X	X	X	X
151.	72100	Doppler Velocity Sensor	X	X27	X27	X27
152.	72170	CARA	X	X25	X25	X25
153.	72320	Waveguide Pressurization System	X	X	X	X
154.	72000	Search Radar	X	X1	X1	X1
155.	72000	Radar	X	X28	X28	X28
156.	72000	Weather Radar	X	X29	X29	X29
157.	76A00	Flare/Chaff Dispenser (AN/ALE-40)	X	X		
158.	76J00	Missile Warning (AN/AAR-47)	X	X		
159.	76N00	Flare/Chaff Dispenser (AN/ALE-47)	X	X		
160.	97A00	Fire Extinguisher System	X	X	X	X
161.	91113	Escape Rope	X	X	X	X
162.	91213	Life Raft	X	X	X	X

#### QUALIFYING NOTES:

1. Test dependent. As determined by test director based on mission objectives.
2. Warning light, latching mechanisms, and locking system must be operational for pressurized flight.
3. One oil quantity gauge can be inoperative provided the oil quantity is verified prior to flight and the low oil quantity light is operational.
4. If inoperative, all four oil quantity gauges must be operational.
5. Oil cooler flaps may be inoperative if the flap can be manually positioned to open and fixed and oil temperature can be maintained within normal limits.
6. If the ATM, ATM generator, or APU fails, flight in visual meteorological conditions (VMC) is authorized provided no other electrical malfunctions exist. If the APU generator is inoperative, the generator will be removed and padded prior to operation of the APU.
7. Propeller may be operated with a feather override failure where the override button fails to pop out at full feather, (faulty pressure switch) provided maintenance instructions in the applicable fault isolation manual are followed and no other system is affected.
8. a. Pressurization and both air conditioning systems must be operational for special weapons mission. b. Pressurization and both air conditioning systems are normally essential if passengers are carried. If a system fails, flight to a destination with repair capability may be accomplished. Passengers will be briefed on the possibility that discomfort may be encountered. c. Air Conditioning and pressurization are not required for low-level missions if a reasonable temperature can be maintained.
9. Automatic system may be inoperative provided manual temperature control can be maintained.

10. a. Automatic controller may be inoperative for pressurized flight provided the manual controller is operative. b. May be inoperative for unpressurized flight.
11. Blade de-icing will be operational for flight into known or forecast icing conditions.
12. May be inoperative for flights that do not require radar.
13. The #1 BSU must be operational.
14. One essential TR unit may be inoperative for flight to a repair facility provided no other electrical malfunctions exist.
15. All associated equipment and indicators will be operational for each operative engine-driven generator (i.e., generator control panel, GCU, voltage regulator, generator out/caution light, AC load meter, etc)
16. For night operations, the left and right wingtip navigation lights must be operational in addition to one of the white lights on the tail cone.
17. Not required for daylight operations. Two lights per wing will be operational for night formation flights
18. One may be inoperative provided the taxi light on the same side is operational.
19. One may be inoperative provided the landing light on the same side is operational.
20. All edge "peanut" lighting or backlit lighting will be operational for night operations for the following instruments; airspeed, altimeters, VVI/VSI, ADI, and HSI.
21. One may be inoperative.
22. One per tank required if tank contains fuel.
23. One main fuel tank indicator may be inoperative provided:
  - a. Both the tank with the inoperative indicator and its symmetrical tank quantity are verified by use of a fuel tank dipstick.
  - b. At enroute stops when engines are shut down, the tank with the inoperative indicator and the symmetrically opposite tank will be dip checked.
  - c. Cross feed operation will begin when the symmetrically opposite quantity indicator has decreased to 1,500 lbs (inboards) and 2,500 lbs (outboards).
  - d. Engine-out training using the engine corresponding to the inoperative indicator or its symmetrical opposite will not be conducted during tank to engine operation.
  - e. Flights consisting of multiple stops when the mission profile does not allow dipping of tanks will terminate with a minimum of 8,000 lbs calculated main tank fuel.
24. Both pilot's altimeters must be operational.
25. Always required if carrying passengers.
26. Two are required.
27. If installed, one must be operational.
28. Required if thunderstorms or hazardous conditions that can be detected by airborne radar are forecast or exist along route of flight.

29. If equipped with two radars then not required, pilots radar is all that is required for flight if known or forecast thunderstorms are expected along route of flight or at night.
30. Vertical velocity indication may be inoperative on one indicator except for flights in RVSM airspace.

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