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HQ-650
AC NO: AC 91-21

DATE: 4/24/69



ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

SUBJECT: INSPECTION SCHEDULE - FOR HANDLEY PAGE MODEL HP-137

1. **PURPOSE.** This advisory circular provides information for use by persons planning to develop an inspection schedule for the Handley Page Model HP-137 aircraft.
2. **NOTE.** The frequency and detail of inspections B, C, and D meet the requirements of FAR 91.171(a)(2)(ii) and (b), if at least one cycle is completed within each 12 calendar months.
3. **BACKGROUND.** The introduction of new models of aircraft designed for high utilization has caused an increasing number of operators to use progressive inspection techniques to meet their operational needs. Accordingly, representatives of the manufacturer and the agency convened recently to consider progressive inspection programs for the Handley Page Model HP-137. It was concluded that a practical program could be developed that is responsive to the usual operational environment of the aircraft and to the progressive inspection provisions of Federal Aviation Regulations 91.171. The working group developed a typical schedule of inspections to assist operators of Handley Page HP-137 aircraft who desire to implement a progressive inspection program. Operators are advised that other inspection schedules may be developed and utilized in the progressive inspection.
4. **EXPLANATION.** The inspection frequency and detail for the Handley Page HP-137 aircraft contained in the enclosed inspection schedule was developed by the working group. To assist operators of this equipment, the manufacturers' recommended times for performing certain maintenance functions are included under the column entitled "Special Inspection Period." The details and definitions associated with this schedule may be found in the Handley Page publication titled, "Recommended Maintenance Schedule."

R. S. Shiff
acting Director,
Flight Standards Service

Initiated by: FS-340

INSPECTION SCHEDULE - TYPICAL

1. INSPECTION FREQUENCY.

- (a) A = Inspection to be accomplished before first flight each day.

This inspection will determine the airworthiness and structural integrity of the airplane by a visual inspection to ascertain that damage has not been caused by ground servicing equipment, refueling activities, or by the elements of nature, that there are no visual fluid leaks, and all servicing panels are closed and secure.

- (b) B = Inspection to be accomplished each 100 hours of flight time.

This inspection and all subsequent inspections identified below are intended to provide detail security and general evaluations of systems/components to a degree at least sufficient to confirm a condition for safe operation until the next higher inspection period is reached.

- (c) C = Inspection to be accomplished each 300 hours of aircraft flight time.

- (d) D = Inspection to be accomplished each 600 hours of aircraft flight time.

- (e) E = Inspection to be accomplished each 1200 hours of aircraft flight time.

- (f) F = Inspection to be accomplished each 1800 hours of aircraft flight time.

- (g) G = Inspection to be accomplished each 2400 hours of aircraft flight time.

- (h) H = Inspection to be accomplished each 3000 hours of aircraft flight time.

- (i) I = Inspection to be accomplished each 6000 hours of aircraft flight time.

Each inspection includes all of the inspection items for all lower inspection periods; i.e., a "D" inspection includes all of the inspection items for the inspections "A" through "D", etc.

Revision of the times specified for inspections identified above may be initiated following substantiation of satisfactory service experience; however, checks "B," "C," and "D" must be completed within 12 calendar months to satisfy the requirement of FAR 91.171.

The 10-hour adjustment permitted by FAR 91.169(b) applies only to inspection frequencies "B," "C," and "D."

2. PROGRAM.

- (a) Items and appliances listed for "On Condition" have been restricted to components on which a determination of continued airworthiness may be made by visual inspection, measurement, test, or other means without a teardown inspection or overhaul. These "On Condition" checks are to be performed within the time limitations prescribed for the inspection or check. Performance tolerances and wear or deterioration limits contained in the manufacturer's maintenance manual apply.
- (b) Actual flight hours for each individual aircraft are applied in determining when the inspection or check intervals are required.
- (c) When this program or a program of this type is used, credit may be taken for early accomplishment of scheduled inspections and/or overhaul provided such early accomplishment does not detract from the evidence required to substantiate time or inspection period extensions. Credit will be applied for experience with similar or comparable systems and/or components in other aircraft.
- (d) Inspection techniques such as "X-ray," "fluorescent penetrant," "sonic," "eddy current," "dye penetrant," etc., may be used as a valuable adjunct to the prescribed visual inspection specified in this inspection program. Any substitution, however, of the inspection techniques mentioned above in lieu of visual inspection is not authorized.
- (e) Component/unit removal for inspection will be performed within the time limitations established in this program. Parts and sub-components not listed herein will be checked and/or inspected at the same time specified for the component or assembly to which such components are related.
- (f) The intervals used in this program are considered to be the maximum time permissible between recurring thorough inspections. Inspection is required not only for the items so listed, but also for the entire surrounding area in which the particular item is located.
- (g) The following identifications are used in this document:

E.O.	=	Engine Overhaul
O.C.	=	On Condition
Flts.	=	Flights
Yrs.	=	Years
Mo.	=	Months

Note: Instructions for exceeding an inspection interval by not more than 10 hours and for changing an inspection interval to be developed by the operator.

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<u>ITEMS</u>	<u>SPECIAL INSP. PERIOD</u>	<u>DETAILED AND ROUTINE INSP. PERIODS</u>	<u>OTHER</u>
<u>FUSELAGE</u>			
6-0 General	O.C.	A, B, D, H, I	Pressurization test of fuselage to 8.75 P.S.I. after repair.
6-1 Main Frames	O.C.	H, I	
6-2 Auxiliary Structure	O.C.	E, H, I	
6-3 Skin Panels	O.C.	E, F, I	
6-4 Attachment Fittings	O.C.	D, H, I	
6-5 Door & Emerg. Hatch	O.C.	A, B, C, D, E, G, H, I	
Emergency Hatches	O.C.		
6-6 Windows	O.C.	A, B, E, I	
6-7 Fillets & Fairings	O.C.	C, H	
<u>WINGS</u>			
7-0 General	O.C.	A, B, F, I	
7-1 Structure	O.C.	F, I	
7-2 Attach Fittings	O.C.	E, F, H, I	
7-3 Ailerons & Tabs	O.C.	A, B, C, F, H, I	
7-4 Flaps	O.C.	A, B, H, I	

Valve, Solenoid	3000	
12-3 Window Anti-Fogging	O.C.	F

OXYGEN SYSTEM

13-0 General	O.C.	A, H	
13-1 Supply & Dist. Cylinders	O.C.	A, B, D, E, G	Hydrostatically test
or Masks, pilots (including			Cylinders every 3 years
-2 demand regulator)	24 mo.		(ICC) Replace cylinders
Mask assembly, passenger	24 mo.		every 9 yrs. (ICC)
Regulators	24 mo.		
Masks, Smoke	24 mo.		

ICE & RAIN EQUIPMENT

14-0 General	O.C.	A
14-1 Airfoil	O.C.	B, D, G, H
Distributor Valve	24 mo	
14-2 Windshield	O.C.	A, D, F, G
14-3 Wipers	O.C.	A, B, C, F, G, H

INSTRUMENTS

15-0 General	O.C.	A, D, E	
15-1 Pitot Static System	O.C.	A, B, C, D, E, G, H, I	Check every 24 mo per
			FAR 91.170
15-2 Independent Instruments	O.C.	A, C, E, F, G	
Altimeter	O.C.		Check every 24 mos per
			FAR 91.170
15-3 Autopilot	O.C.	D, E, G	

FURNISHINGS & EQUIPMENT

16-0 General	O.C.	None
16-1 Pilots Seats & Belts	O.C.	A, B, C
16-2 Passenger Seats & Belts	O.C.	A, C, G
16-3 Soft Furnishings	O.C.	C

16-4	Emergency	O.C.	A, B
16-5	Lavatory	O.C.	A, C
16-6	Galley	O.C.	A, C

POWERPLANT

17-0	General	O.C.	B
17-1	Structure & Firewall	O.C.*	B, C, D, I

*Subject to satisfactory
X-ray examination for
internal corrosion at
6000/60 mo.

17-2	Cowling & Fairing	O.C.	A, C, D
17-3	Installation	O.C.	A, B, C
	Engine Astayou XIV		
	Turbomica	2000*	

*Subject to satisfactory
strip examination of two
engines at 250 hr periods
starting from 750 hours.

17-4	Oil Cooler System	O.C.	C
17-5	Jet Pipe	O.C.	A, C
17-6	Controls	O.C.	D, E
17-7	Drains	O.C.	B, C
17-8	Indicators	O.C.	E, G
	Indicator, Jet Pipe Temp.	6000/36 mo	

FUEL SYSTEM

18-0	General	O.C.	B
18-1	Tanks	O.C.	A, I
18-2	Distribution	O.C.	B, D, E, G
	Boost Pump A.C.	5000*	

*Subject to sampling of
two units at 1000 and
2000 hours.

	Fuel Cocks	60 mo.	
18-3	De-Icing		A, D, E, G, H
	Pump, Filter De-Icing	3000	
18-4	Quantity Indicators	O.C.	E, G, I

POWERPLANT FIRE PROTECTION

19-0	General	O.C.	A
19-1	Detection	O.C.	D, E, G, H
19-2	Extinguishing	O.C.	A, B, C, D, E, G, I
	Tubing	O.C.	A, B, C, D, E, G, I
	Flex Tubing	O.C.	A, B, C, D, E, G, I

PROPELLER & SPINNER

20-0	General	O.C.	
20-1	Propeller & Spinner		A, B, D, F, G
	Propeller	2000*	

*Subject to satisfactory
strip examinations of two
propellers at 250 hr.
periods starting at 750
hrs.

20-2	Anti-Icing	O.C.	A, B, E, G
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ENGINE STARTING & POWER CONTROL

21-0	General	O.C.	B, D, E, G
	Starting Control Box	E.O.	
	Unfeathering Pump, propeller	E.O.	

ELECTRICAL POWER

22-0	General	O.C.	A, B
22-1	Battery Circuit	O.C.	E, F, G
22-2	D.C. Generator Circuit	O.C.	B, D, E, F, G
	Starter/Generator	E.O.	
22-3	A.C. Alternator Circuit		E, F, G
	Alternator	E.O.	
22-4	Inverter		E, F, G, I

LIGHTING

23-0	General	O.C.	A
23-1	External	O.C.	D, E, G
23-2	Internal	O.C.	A, C, E, G

AVIONICS

24-0 General

The inspection program for instruments, communication and navigation equipment is established by each individual operator.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Washington, D.C. 20590

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DEPARTMENT OF TRANSPORTATION

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J (AC NO. 91-21)

~~Proposed~~ Advisory Circular (AC) on Use of Portable Electronic
Devices Aboard Aircraft.

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Request for comments on proposed AC on Use of Portable
Electronic Devices Aboard Aircraft.

SUMMARY: The proposed AC is intended to provide aircraft
operators with information and guidance to assist them in
determining whether the operation of any portable electronic
device will cause interference to communication and navigation
systems aboard aircraft in which it is to be operated.

COMMENTS INVITED: Comments are invited on all aspects of the
proposed AC.

Commentators must identify file number AC 91.21.

DATE: Comments must be received on or before *March 15, 1993*

ADDRESS: Send all comments and requests for copies of the
proposed AC to: Federal Aviation Administration, Aircraft
Maintenance Division (Attention: AFS-350), 800 Independence
Avenue, SW., Washington, D.C. 20591.

FR DOC 93-3280

issued in Washington D.C., Feb 2 1993

*FRANK ROCK
C.P.I. = AIR-*

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FOR FURTHER INFORMATION CONTACT: Milton Hill, AFS-350, at the
above address; telephone: (202) 267-3810 (8:30 a.m. to
5 p.m. EST).

Issued in Washington, D.C., on

USE OF PORTABLE ELECTRONIC
DEVICES ABOARD AIRCRAFT

1. PURPOSE. This advisory circular (AC) provides aircraft operators with information and guidance to assist them in determining whether the operation of any portable electronic device will cause interference to communication and navigation systems aboard aircraft in which it is to be operated. Federal Aviation Regulations (FAR) Section 91.21 prohibits the operation of portable electronic devices aboard aircraft operated by the holder of an air carrier operating certificate or an operating certificate or any other aircraft while it is operated under instrument flight rules. The rule permits the operation of specified portable electronic devices and other devices that the operator of the aircraft has determined will not cause interference with the safe operation of the aircraft in which it is operated. The recommendations contained herein are one means but not the only means of compliance with the requirements of FAR Section 91.21 pertaining to the operation of portable electronic devices.

2. CANCELLATION. AC 91.47, Use of Portable Electronic Devices--Radio Receivers, dated March 23, 1977.

3. RELATED FAR SECTIONS. FAR Section 91.21.

4. BACKGROUND. FAR Section 91.21 (formerly 91.19) was initially established in May 1961 to prohibit the operation of portable frequency-modulated radio receivers aboard all U.S. air carrier aircraft and all U.S. registered aircraft when the very high frequency omnidirectional range (VOR) was being used for navigation purposes. The Federal Aviation Administration subsequently determined that other portable electronic devices could be potentially hazardous to aircraft communication and navigation equipment if operated aboard aircraft. Amendment 91-35 amended the scope of former FAR Section 91.19 to prohibit the use of additional portable electronic devices aboard certain U.S. civil aircraft. Recent studies conducted by the Radio Technical Commission for Aeronautics (RTCA) have contributed greatly to an understanding of the operational effects of portable electronic devices. In a study published on September 16, 1988, the RTCA Special Committee-156

concluded that its investigation of potential interference to aircraft electronic systems from portable electronic devices operated aboard aircraft has shown that the probability of interference is small. In order for interference to occur, multiple conditions are required for receiver disruption. The probability of all necessary conditions occurring simultaneously is extremely low.

5. DISCUSSION. FAR Section 91.21 allows the operation of portable electronic devices which the operator of the aircraft has determined will not cause interference with the navigation or communication system of that aircraft. The determination of the effect of a particular device on the navigation and communication system of the aircraft on which it is to be used or operated can be made by the operator and/or the pilot in command without "red tape" or burdensome tests and procedures. In many cases, the determination can be based on operational tests conducted by the operator without sophisticated testing equipment. The operator may also elect to obtain the services of a person or facility having the capability of making the determination for the particular electronic device and aircraft concerned or may rely upon manufacturers' published data. To require an FAA-conducted or -verified test of every portable electronic device as an alternative solution to a determination by the operator would place an excessive and unjustifiable burden upon the agency. Therefore, the rule as adopted was drafted to require the air carrier or commercial operator to determine whether a particular portable electronic device will cause interference when operated aboard its aircraft. This determination may be made by personnel specifically designated by the air carrier or commercial operator for this purpose and may, where appropriate, include the pilot in command. For other aircraft, the language of the rule expressly permits the determination to be made by the pilot in command or other operator of the aircraft. Thus, in the case of rental aircraft, the determination could be made by the pilot or the fixed base operator.

6. RECOMMENDED PROCEDURES FOR THE OPERATION OF PORTABLE ELECTRONIC DEVICES ABOARD AIRCRAFT.

a. If an operator allows the use of portable electronic devices aboard its aircraft, procedures should be established and spelled out clearly to control their use during passenger-carrying operations. The procedures, when used in conjunction with an operator's program, should provide as a minimum for the following:

(1) Methods to inform passengers, which are adequately spelled out as part of oral departure briefings, passenger information cards, and other methods deemed appropriate by the operator to notify passengers concerning the use and operation of portable electronic devices and conditions and limitations regarding their operation aboard the aircraft in which it is to be operated. The limitations, as a minimum, should state that all such devices (except medical devices) are prohibited from operation during phase(s) of operation when their use could interfere with the ability of the flightcrew to give necessary instructions in the event of an emergency.

(2) Procedures to terminate the operation of portable electronic devices suspected of causing interference with aircraft systems.

(3) Procedures for reporting instances of suspected and confirmed interferences by a portable electronic device to the local FAA Flight Standards District Office.

(4) Cockpit-to-cabin coordination and cockpit flightcrew monitoring procedures.

(5) Procedures for determining acceptability of those portable electronic components to be operated aboard its aircraft.

The determination of the effects of a particular portable electronic device on the navigation and communication systems of the aircraft on which it is to be operated must be made by the operator of the aircraft. The operation of a portable electronic device is prohibited unless the device is specifically listed in FAR Section 91.21(b)(1 thru 4) or pursuant to FAR Section 91.21(b)(5). The operator determines that the operation of that device will not cause interference with the communication and navigation system of the aircraft on which it is to be operated.

b. Portable Electronic Devices Designed to Transmit. There are certain devices which, by their nature and design, transmit intentionally. These include citizens band radios, cellular telephones, remote control devices, etc. These devices are typically licensed as land mobile devices by the Federal Communications Commission (FCC). The FCC currently prohibits the use and operation of cellular telephones while airborne. The FCC's primary concern is that a cellular telephone while used airborne would have a much greater transmitting range than a land mobile unit. This could result in serious interference to transmissions at other cell locations since the system uses the same frequency several times within a market. Since a cellular mobile telephone unit is capable of operation on all

assignable cellular frequencies, serious interference is also caused to cellular systems in adjacent markets. The FAA supports this airborne restriction, but for reasons of potentially hazardous interference to critical aircraft systems. Aircraft operators may allow the use of cellular telephones aboard their aircraft while the aircraft is within the apron/ramp area provided they have procedures which will preclude their use, and ensure their stowage, when the aircraft is being taxied for takeoff. As an example, the use of cellular telephones after landing, while taxiing in, or while awaiting a gate opening would not normally present problems. After push back during prolonged periods of remaining stationary, as might occur during passage of a squall line or during a ground hold, the captain might elect to inform passengers that cellular telephones may be used. A cellular telephone must not be authorized for use while the aircraft is being taxied for departure after leaving the gate. Whatever procedures a carrier elects to adopt should be clearly spelled out in oral departure briefings and by written material provided to each passenger, avoiding passenger confusion.

c. Those telephones which have been permanently installed in the aircraft and are licensed as air-ground units are operated on the allocated or assigned air-ground radio telephone service frequencies. In addition, they are installed and tested in accordance with the appropriate certification and airworthiness standards. These devices are not considered portable electronic devices provided they have been installed and tested by an FAA-approved repair station or an air carrier's-approved maintenance organization and are licensed by the FCC as air-ground units.