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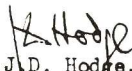
INTER-DEPARTMENTAL MEMORANDUM

Ref 6549/02A/J.
Date March 29, 1957.
To Mr. S.E. Harper - Chief Experimental Engineer
From J.D. Hodge - Technical Flight Test Co-ordinator
Subject ARROW I INSTRUMENTATION - PART 6 - ISSUE 8

Herewith Issue 8 of Part 6 of "CF-105 Instrumentation" covering the air conditioning system. It will be noted that in most cases this amounts to a re-location of the instruments as a result of ground-rig tests.

This replaces Issue 7 of Part 6, November 27th, 1956.

JDH/h


J.D. Hodge,
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March, 1957.

CF-105 - INSTRUMENTATION - ISSUE 8

AIR CONDITIONING SYSTEM

Items underlined are changed from Issue 7, Ref. 4028/02A/J, November 27, 1956.

1. LIST OF INSTRUMENTATION

Number indicates location in system, see sketch.

T - instrument to measure temperature.

P_s - instrument to measure static pressure.

P_t - instrument to measure total head pressure.

ΔP - $P_t - P_s$.

<u>Location</u> <u>See Sketch</u>	<u>Instruments</u> <u>Required</u>	<u>Description</u>
1	T P_s	As close to Port engine bleed as possible.
2	P_s	<u>Downstream from the reducing valve on Port engine line at such a distance that the valve does not affect the measurement.</u>
3	T P_s ΔP	Mass flow for fuel pressurization system.
4	T P_t	Turbine inlet conditions.
5	T P_s (rake)	<u>Turbine outlet conditions. The temperature probe should be located downstream from the turbine outlet at the junction point.</u>
6	T RPM	Fore and aft bearing temperatures and shaft R.P.M.
<u>7A</u>	T	Cabin inlet (at temperature sensor).
<u>7B</u>	T P_s ΔP	Mass flow from cabin. Measure temperature at sensor and pressure downstream from this.
8	T P_s	Cabin conditions. Temperature to be measured at six points.
9	T P_s or P_t (rake)	<u>As close as possible to fan inlet. (Static or total may be measured)</u>
10	T P_s or P_t (rake)	<u>As close as possible to fan outlet. (Static or total may be measured)</u>
<u>11</u>	T	Ram air exit.
<u>12</u>	T	In equipment duct.

(Continued.....)

2. SUMMARY

2.1 Temperature

Instrument	Range (°F)	Accuracy (°F)	Accuracy (% of Range)	Recording Frequency
T1	+100 +1000	±10	1%	1/sec
T3	-20 +400	±5	1%	5/min
T4	-20 +250	±5	2%	5/min
T5	-30 +100	±4	2%	5/min
T6	0 +500	(to be built into turbine unit)		2/min
T7A&B	-20 +130	±5	3%	5/min
T8 (6 off)	0 +200	±2	1%	
T9	0 +500	±10	2%	5/min
T10	0 +600	±10	2%	5/min
T11	0 +500	±10	2%	5/min
T12	0 +140	±5	3%	5/min

2.2 Static Pressure

Instrument	Range (psia)	Accuracy (psi)	Accuracy (% of Range)	Recording Frequency
P _g 1	0-360	±10	2%	1/sec
P _g 2	0-100	±1	1%	1/sec
P _g 3	0-100	±1	1%	5/min
P _g 5 (<u>rake</u>)	0-20	±0.2	1%	5/min
P _g 7	0-20	±0.2	1%	5/min
P _g 8	0-20	±0.1	0.5%	1/sec
P _g 9 (<u>rake</u>)	0-20	±0.2	1%	5/min *
P _g 10(<u>rake</u>)	0-20	±0.2	1%	5/min *

* Note: Either static or total may be measured.

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2.3 Total Head Pressure

Instrument	Range	Accuracy (psi)	Accuracy (% of Range)	Recording Frequency
ΔP_3	0-5 psi	± 0.25	5%	5/min
P_{t4}	0-100 psia	± 1	1%	5/min
ΔP_7	0-1 psi	± 0.05	5%	5/min
P_{t9} rake	0-30 psia	± 0.3	1%	5/min *
P_{t10} rake	0-30 psia	± 0.3	1%	5/min *

* See note Page 23.

2.4 Miscellaneous

In addition, it is required to measure turbine R.P.M., see location 6 in sketch. As in the case of bearing temperature, transducers will be built into the unit by AIResearch.

The sampling rate required for turbine R.P.M. is 5/sec.

