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**Calibration: Fischer and Porter: flow meter model 10C1505: serial 600  
3A 1027 A23**  
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**REPORT**  
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Canadian Aviation Electronics

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Letter of Oct. 12, 1965 to Mr. M.S. Kuhring from Mr. A.W. Egerton of Canadian Aviation Electronics requesting calibration of Fischer and Porter Flow Meters.

**LTR-**  
**ENG-7**

Calibration  
FISCHER and PORTER  
Flow Meter  
Model 10C1505  
Serial 600 3A 1027 A23

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## 1. INTRODUCTION

At the request of C.A.E. Ltd., Montreal, a volumetric calibration of a turbine type flow meter was carried out, using water as the test fluid.

## 2. EXPERIMENTAL APPARATUS

The water was taken from an overhead reservoir, filtered, and then fed to a vane pump. The outlet of the pump was fitted with a by-pass line and valve to help regulate the flow. A flow control valve fed the water through a flexible hose to a straight pipe connected to the inlet of the transducer and a similar pipe was fitted to the transducer outlet. A hose then carried the fluid to a fifty-gallon tank, fitted with waste valve and mounted on a platform scale. The straight pipes on the inlet and outlet of the flow meter were of a length in excess of twenty diameters of the bore of the transducer. The electrical output of the flow meter was indicated on an electronic counter.

## 3. TEST PROCEDURE

The method used to calibrate the unit was to establish the weight of fluid pumped through the transducer over a given time, while the number of pulses generated by the meter was totaled on the electronic counter.

Fifty-pound weights, accurate to better than 0.1 percent were placed on top of the tank. A flow was set up and the waste valve on the tank was closed. When the scale balanced, the counter, and at the same time a stop watch, were started. The weights were then removed and, when the scale balanced again, the counter and watch were stopped. The weight of fluid in the tank equalled the weights removed, thus eliminating the error of the scale calibration.

At least thirteen points were recorded over the specified range of interest. The temperature and specific gravity of the water were measured; the specific gravity was determined to four decimal places, using a Westphal balance.

Because this type of transducer is not linear over the range of interest a K factor of cycles/gallon was requested. The data were plotted as rate of flow in lb./hr. against K factor and the mean point between the maximum and minimum points in the range of interest was taken as the mean K factor.

Two K factors were computed, one for Imperial gallons, and one for U.S. gallons. The conversion factor used was 1.2009 U.S. gallons to one Imperial gallon.

4. CONCLUSION

A K factor of 2468 cycles/U.S. gallon was measured over the range 1500 lb./hr. to 9000 lb./hr. within the tolerance band of  $\pm\frac{1}{2}$  percent.

<u>TOTAL COUNT</u>	<u>WEIGHT OF FLUID</u>	<u>TIME IN SEC.</u>	<u>RATE OF FLOW</u>	<u>CYCLES/GAL.</u>
	<u>lb.</u>		<u>lb./hr.</u>	<u>IMPERIAL</u>
29410	100	391	920	2941
29782	100	234	1538	2978.2
59708	200	291	2474	2985.4
59283	200	213	3380	2969.2
59370	200	170	4235	2968.5
89024	300	209	5167	2967.8
89124	300	179	6033	2970.8
88922	300	153	7058	2964.0
118538	400	182	7912	2963.5
118274	400	163	8834	2956.7
117504	400	148	9729	2937.6
59417	200	189	3809	2970.8
88624	300	186	5296	2954
89025	300	197	5482	2963

FISCHER + PORTER

MODEL 1001505

3/4"

SERIAL 6003A1027 A-23

K-2965 CYCLES/IMPERIAL GAL

K-2471 CYCLES/US GALLON

CALIBRATED WITH WATER

SPECIFIC GRAVITY 1.0001

TEMPERATURE 20.4°C

T. A. HAMMILL

NATIONAL RESEARCH COUNCIL

ENGINE LAB 5 Nov 1965



