Hot-wire calibration procedure
(The single-wire calibration procedure followed by K. Zaman can have variations depending on particular experiment and preference of user)

(1) Install the hot-wire on probe support and attach appropriate connecting cable. Connect other end of cable to IFA100 unit. For CW17, the IFA unit is in the control room (cabinet #20). For CW13, the unit is in the test cell instrument cabinet.

(2) Follow TSI "IFA 100 System" manual to configure and set-up the entire system. This involves: measuring the cold resistance, setting the operating resistance, tuning the system and setting gain and offset in the signal conditioner. [Notes: (1) tuning may be done with zero flow but should be repeated at operating speed, (2) gain and offset should be set such that the output voltage is within the range ±5 volts in order to match the A/D converter (CAMAC) range].

(3) Place hot-wire in the flow (wire should be perpendicular to the mean flow direction). In CW17 the calibration can be done at the exit of a convergent nozzle. In CW13 this can be done in the wind tunnel test section.

(4) The flow velocity can be calculated from plenum-chamber-to-ambient pressure ratio (CW17) or from the Pitot-Static pressure transducer outputs (CW13). For low speed wind tunnel operation (CW13) static minus total pressure and assumption of incompressibility may be sufficient. Hot-wire and pressure transducer outputs should be read simultaneously using the multi-channel A/D converter (CAMAC).

(5) Take at least six data points covering low to somewhat higher than the highest velocity expected in the flow field. Zero velocity readouts should be the first data.

(6) Fit a fourth order polynomial through the velocity (dimensional) versus bridge output (voltage) data arrays, using least-squares-fit. Store the five polynomial coefficients in a suitable data file in the computer. This completes the calibration.

(7) During experiment, read the polynomial coefficients before data acquisition. Voltages may be converted to velocity through the polynomial equation. Average of a time series velocity array would provide mean velocity. Calculation of mean square (or r.m.s) can be performed after subtracting the mean from the array.

Procedure approved by……..
Procedure reviewed by…….. Date……
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