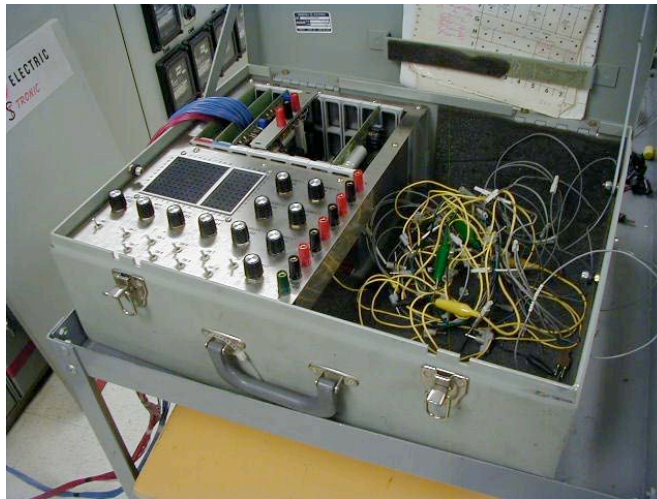


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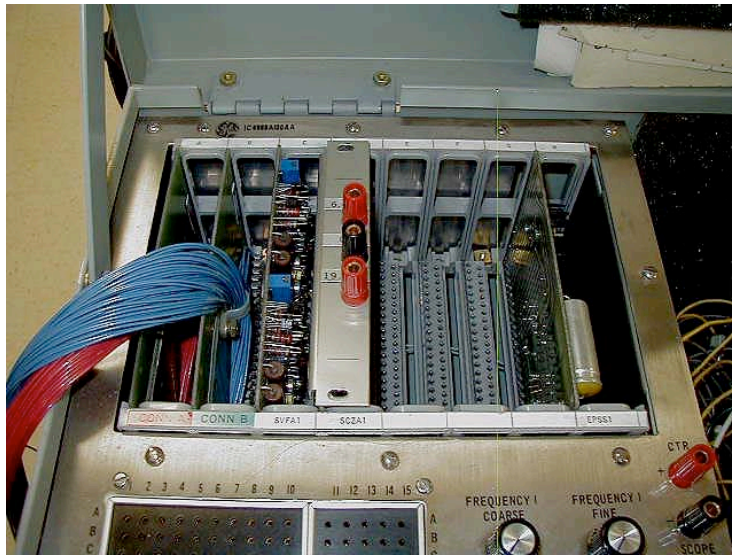
Use of the GE Calibrator– for use on Speedtronic™ Mark I or Mark II

During the early 1970s, GE offered a test tool to purchasers of their gas turbine power plants called the *Speedtronic™ Calibrator*. It was a device that could be used to calibrate the turbine control panel circuitboards, and could be connected to the



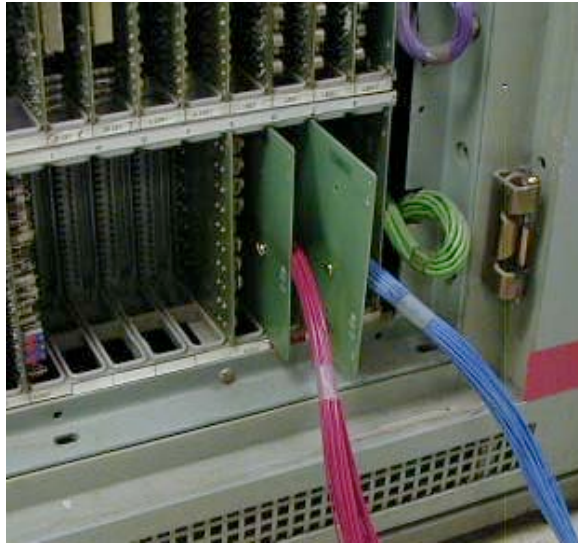
Typical GE Speedtronic™ Calibrator connected to panel

Speedtronic™ panel in the card rack (referred to in GE drawings as the “1L Page”) via color-coded ribbon connectors (red and blue shown) to two designated slots.



Ribbon connectors: CONN A (Red) and CONN B (blue) going out from Calibrator

On a Mark I panel, for instance, the insert points are at locations: **Row 4, slots D and C.**



Calibrator 51-pin Ribbon connectors for slots D (red) and C (blue)

Uses of the Calibrator

More than just a *Calibrator*, however, the device can also be used as a *Simulator* during shutdown and testing; and as a signal *Monitor* during startup and operation.



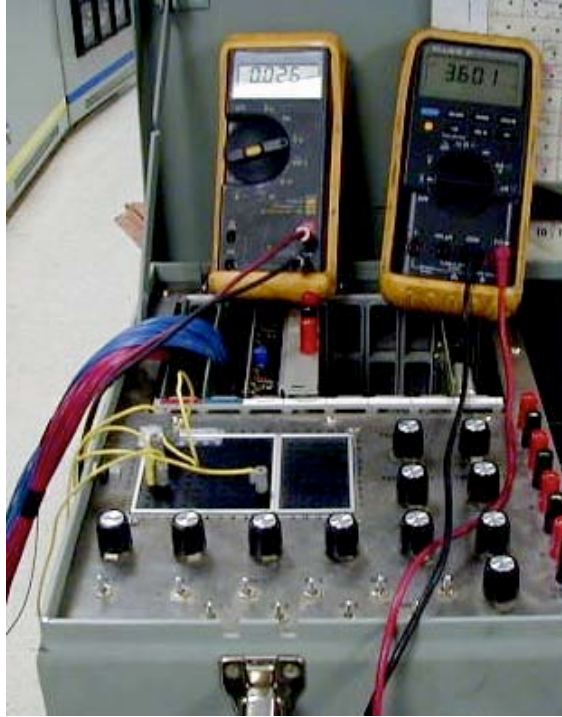
Dave Lucier Calibrating Speedtronic™ Mark I panel at Ameren-UE, Jefferson City, MO

As a *Calibrator*:

The box has the following signals that can be used for calibration:

1. Two **frequency** signals for calibrating: speed control, speed relays, overspeed and flow divider speed (if liquid fuel).

2. Two millivolt signals for calibrating exhaust temperature control and over-temperature protection.
3. One **voltage** or **current** source for simulating pressure transducers: compressor discharge pressure (PCD) or gas fuel pressure P2), if applicable.



Digital voltmeters and yellow patchboard jumpers

As a *Simulator*:

A technician often does not have time to perform a complete panel calibration. This is particularly true when **troubleshooting** or **testing**. When the turbine is shut down, it is possible to connect this tool and along with some voltmeters, to read input signals (frequency for turbine speed, millivolts for exhaust temperature, etc.). Another meter can be used to check feedback signals like **VCE**, **NHP**, **TX** and **FFN** at patchboard locations.

Other things can be quickly checked:

1. Did all the auxiliary speed relays energize (see the 2L relay page on the panel)? For instance, when 14HM energizes at 20% speed, let's say, did 14HMX-1 through 14HMX-5 also energize?
2. Do timers start when they are supposed to? That is, does the 2W turbine warm-up timer start when firing speed is reached and flame is "simulated" to have occurred?



Bill Fish simulates turbine operation using the Calibrator

As a *Monitor*:

The *Calibrator* can be connected into the panel **prior to** startup and/or **during** turbine operation. Care must be taken if the ribbon connectors are inserted during turbine operation, not to inadvertently “ground out” the controls. The ribbons are very rigid and can act like springs that might be dropped on the metal floor, grounding out the controls.

Caution: No **YELLOW** jumpers should be connected on the patchboard. Also, all of the switches should be in the down (**OFF**) position to prevent stray signals emanating from the *Calibrator* from entering the panel.

Once connected, the patchboard becomes a convenient location to measure about 30 different signals from the panel. This helps the technician diagnose problems and measure data to compare to the Controls Specifications. To know where the signals enter and from where they emanate, you have to refer to the Turbine Electrical Elementary Drawings (usually sheet 42B).

For more information or training on the use of the **Speedtronic™ Calibrator**, contact Pond And Lucier, LLC.