TYPE 162

FACTORY CALIBRATION PROCEDURE

RECOMMENDED EQUIPMENT

160A Power Supply.
180 Time Mark Generator.
500 Series scope with a CA Plug-in.
Square Wave Generator with variable output (scope Calibrator with a 50k Potentiometer across it will work)

PRELIMINARY INSPECTION

Check for unsoldered connections, rosin joints, check that components do not project beyond the sides of the instrument, check wire dress. Preset both trimmers to mid-scale and the calibration pot to mid-range. Preset the front panel controls as follows:

OPERATING MODE	RECURRENT
VERNIER	CALIBRATED POSITION
WAVEFORM DURATION	1.0
MULTIPLIER	1.0

Connect power to the 160A and check voltages in the 162. They will be approximately the same as the 160A except for the drop across the decoupling resistors.

1. CHECK SAWTOOTH OUT

Connect a 10X probe from the scope input to the sawtooth out and observe the sawtooth waveform. The sawtooth is a negative going and must go from a voltage of +148 -- 152 to +22 -- 15 volts. The voltage should not exceed these limits.

2. CHECK GATE OUT AMPLITUDE

Connect the 10X probe to the Gate/Pulse out jack and switch the toggle switch to the GATE OUT position. The gate out should have an amplitude of not less than 50 volts and should be of the same duration as the sawtooth.

3. CHECK PULSE OUT AMPLITUDE

Switch the toggle switch to the PULSE OUT position and observe the waveform. Adjust C9 for a flat top on the pulse. The pulse must have an amplitude of at least 50 volts.

4. CHECK +GATE IN AND +TRIGGER IN SENSITIVITY

use 161 or 163

S/N 3093 12½

Connect the output of the square wave generator to the GATE IN and to the other channel of the CA plug-in. Switch the 162 OPERATING MODE switch to the GATED position and increase the square wave input amplitude until the 162 triggers on the GATED position. The 162 should gate on a voltage of between 2 and 7 peak to peak. Switch the OPERATING MODE switch to the triggered position and apply the square wave to the +TRIGGER IN position. The 162 must trigger on a voltage less than 2½ volts.

5. ADJUST CAL.

Adjust the VERNIER knob so that at its maximum ccw position, the pointer will point at 9:00 o'clock. Turn the vernier knob to the calibrated position. Connect the output of the 180 to one channel of the CA and connect the 10X probe on the other channel to the PULSE OUT jack. With the WAVEFORM DURATION and the MULTIPLIER knobs set at 1 and the OPERATING MODE switch set at RECURRENT, adjust the

CAL. so that the pulse out waveform timing interval is exactly the same as the 180 markers.

6. CHECK RANGE AND CALIBRATION OF VERNIER CONTROL

Using the previous set-up check that rotating the VERNIER control will move the eighth pulse below the eighth 180 marker and beyond the tenth 180 marker at the two extremes of rotation.

7. CHECK MULTIPLIER STEPS

Using the scope calibration and checking against the 180 timing, check the 10, 100, 1000 ranges of the MULTIPLIER switch. ±3% (Make sure that the VERNIER is in the calibrated position and the WAVEFORM DURATION knob is in the 1.0 position. Now switch the 162 to the 0.1 range (100 μsec - 180) on the MULTIPLIER switch and adjust C3B for proper timing. (Actually it is C3C but most of them are stamped C3B) Now switch the WAVEFORM DURATION switch to the 10 position and check the timing. If the timing is off more than 5% this may be remedied by replacing the 6BH6. If 6BH6 is replaced, recheck timing on all ranges.

8. CHECK MANUAL OPERATION

Set the WAVEFORM DURATION switch to 10 and the MULTIPLIER switch to 0.1. Switch the OPERATING MODE switch to CONT. and press the MANUAL button. (If the 162 continues to free run after the button is released, R15 is too large or R14 is too small.) Now switch the OPERATING MODE switch to ONE CYCLE and press the MANUAL button and check to see that only one pulse or sawtooth results. (If two or more appear intermittently, it is probably due to a faulty MANUAL switch.)

9. CHECK WAVEFORM DURATION OR PULSE INTERVAL STEPS

With the 162 on recurrent operation and the MULTIPLIER switch on 1, check the waveform duration timing for accuracy. ±3%

10. CHECK RISETIME OF PULSE

Check the risetime of the pulse out. This must be less than 1.0 microsecond.