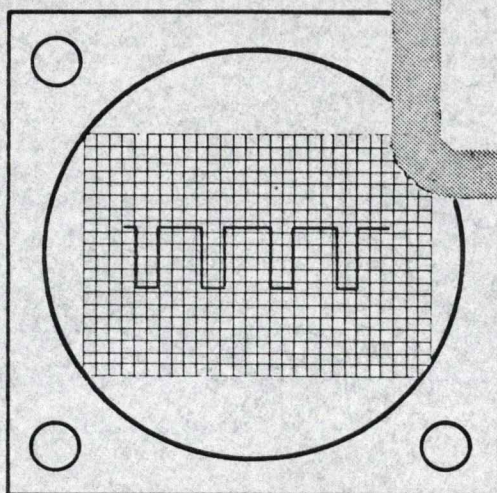


**MAINTENANCE  
AND  
INSTRUCTION MANUAL  
FOR MODEL II  
TELEMETRY CALIBRATOR**

**(50M66508)**



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TELEMETRY SYSTEMS BRANCH



### 1.3 FUNCTIONAL

#### 1.3.1 Signal Definitions.

##### 1.3.1.1 Input Signals.

During inflight operation, the calibrator requires only four inputs: 28-vdc power, 5-vdc reference voltage, 28-vdc for comparator disable, and 28-vdc calibrate command. For preflight checkout, the calibrator accepts three additional inputs: A 1 volt p-p, 0 to 3000 Hz sweep signal, a 28-vdc SS/FM calibrate-enable signal, and preflight dc levels (0%, 25%, 50%, 75%, 100%, and 200% of the 5-volt dc reference). Preflight checkout also requires removal of the 28-volt dc comparator-disable signal.

##### 1.3.1.2 Output Signals.

Figure 1-3 illustrates the eleven calibrator-output signals. The six FM/FM calibrate-enable signals appear for  $0.7 \pm 0.025$  sec each, which is the period of one staircase voltage output. Therefore, each FM/FM telemetry link receives one staircase voltage during the calibrator cycle of  $4.2 \pm 0.15$  sec. Each of the staircase voltage levels has a 10-millivolt tolerance. The  $1700 \pm 51$ -Hz,  $1 \pm 0.015$ -volt peak-to-peak signal remains constant throughout the complete calibrator cycle. The three SS/FM calibrate-enable signals last  $1.4 \pm 0.05$  sec each. The 28-vdc calibrate-enable signal sequence is shown in figure 1-3.

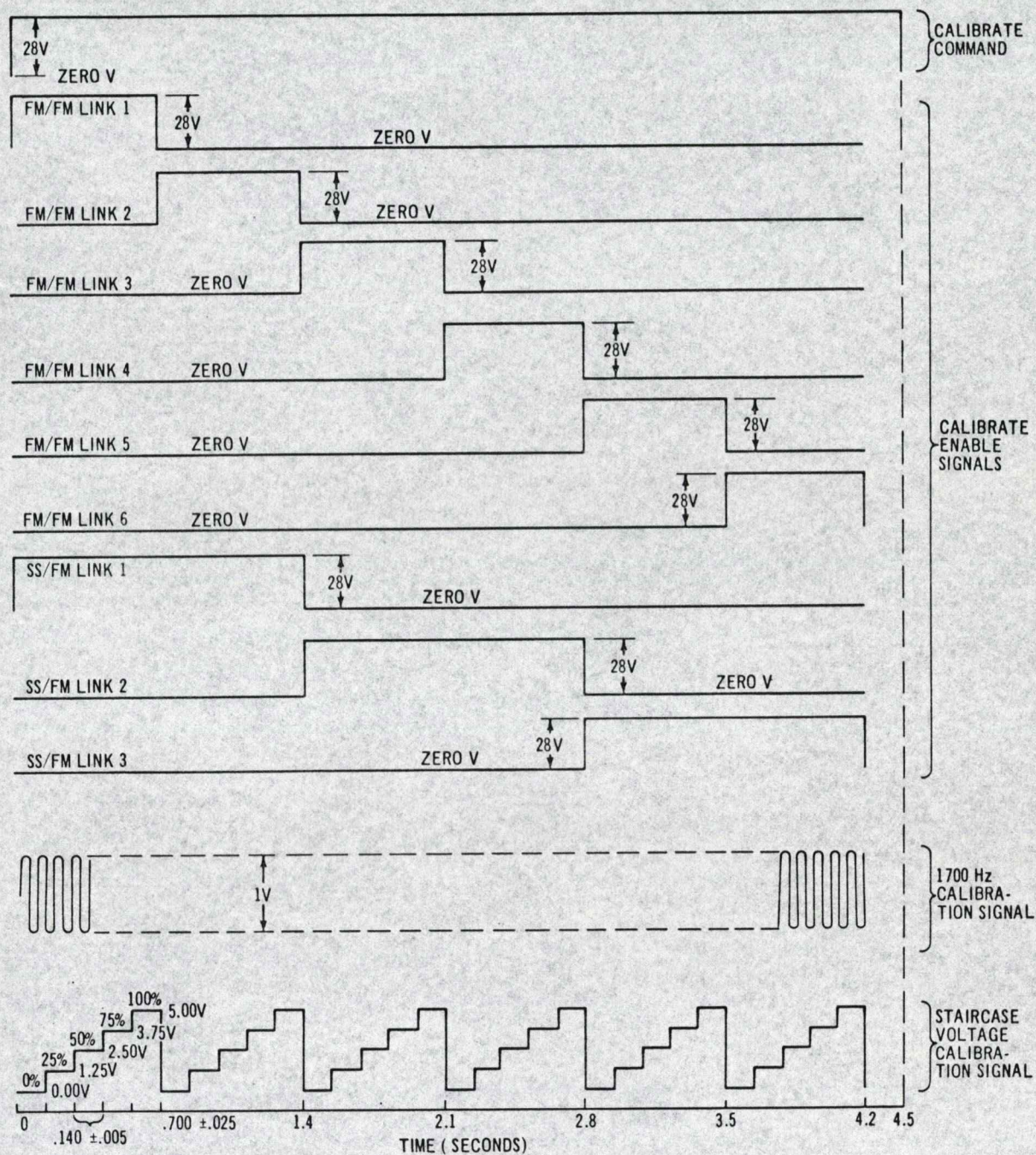
#### 1.3.2 System.

This brief description of the basic calibrator functions follows the block diagram in figure 1-4. The blocks in this diagram do not necessarily represent printed circuit cards or welded modules but represent functioning subsystems of the calibrator.

##### 1.3.2.1 Calibration Cycle.

Initial power application sets the control flip-flop, the 5-point sequencer, and the 7-point sequencer. The calibration command operates the control flip-flop and enables the relay drivers and gates. The control flip-flop enables

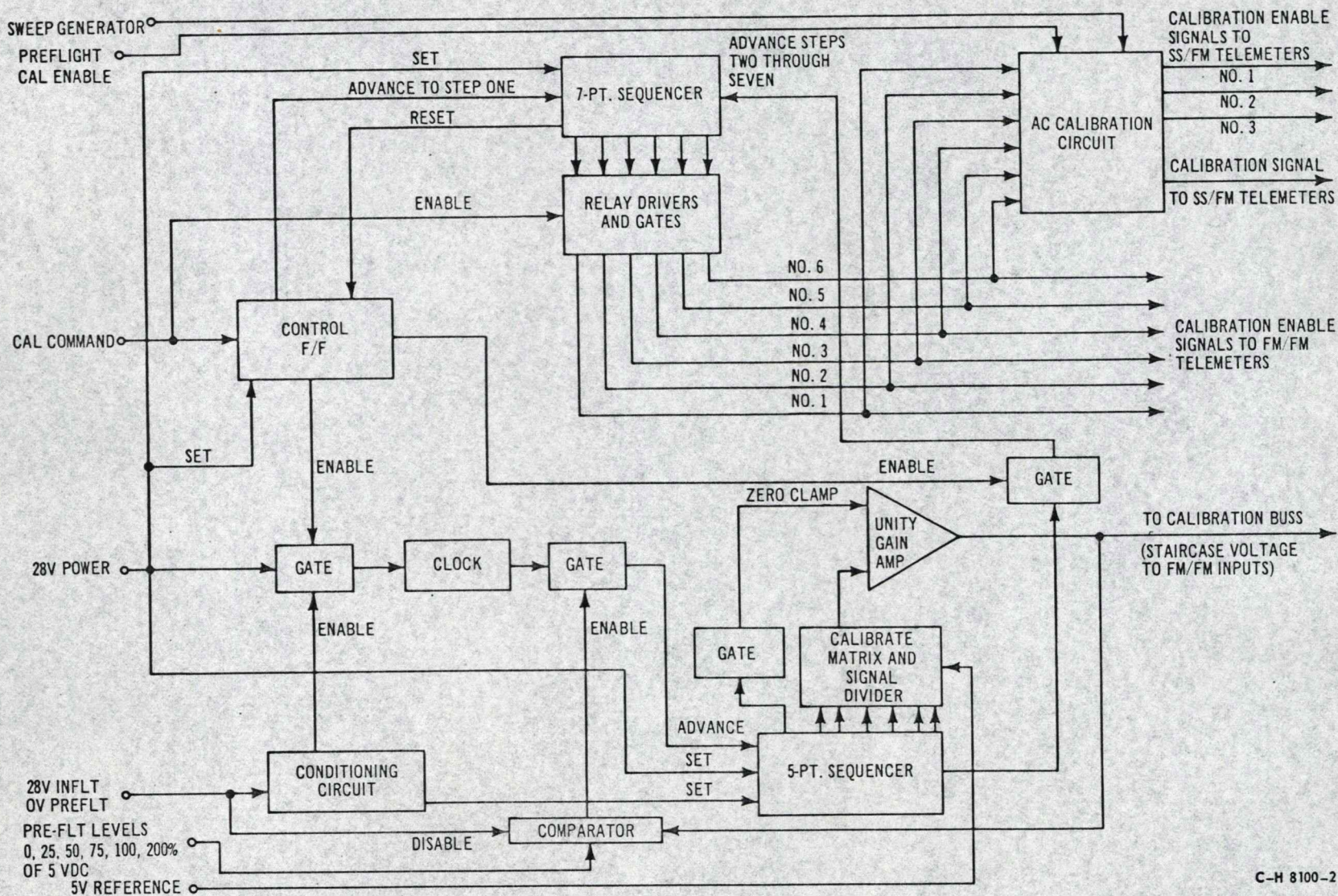




C-H 8099-2

FIGURE 1-3. CALIBRATOR SIGNALS





C-H 8100-2

FIGURE 1-4. CALIBRATOR BLOCK DIAGRAM



the 7-point sequencer input gate and the clock input-gate and advances the 7-point sequencer to step one. At step one, the 7-point sequencer signals the relay drivers and gates to issue calibrate-enable signal number one. The ac calibration circuit then issues the ac calibration signal and SS/FM calibrate-enable signal number one. The 5-point sequencer issues a zero-clamp signal to the unity-gain amplifier that holds the amplifier output at zero volts.

With the clock input-gate enabled, the clock issues pulses at 140-millisecond intervals. The 28-volt inflight signal disables the comparator holding the clock output-gate open. The clock pulses advance the 5-point sequencer through its five steps that signal the calibrate matrix and signal divider to produce the staircase voltage. The unity-gain amplifier provides needed power gain with unity voltage-gain.

At each fifth step of the 5-point sequencer (a complete cycle), a signal advances the 7-point sequencer. As the 7-point sequencer advances, the relay drivers and gates issue the successive calibration-enable signals. When the 7-point sequencer advances to step seven, it sends a reset command to the control flip-flop stopping operation and completing the calibration cycle.

#### 1.3.2.2 Preflight Operation.

The comparator and conditioning circuit allow checking of the staircase-voltage output during preflight operation. The zero-volt preflight signal to the conditioning circuit enables the clock input-gate. When the unity-gain amplifier output voltage level equals the particular preflight level supplied to the comparator, the comparator disables the clock output-gate. Therefore, the 5-point sequencer stops, holding the output voltage at the desired level.

At application of the 28-volt inflight signal, the conditioning circuit issues a set command to the 5-point sequencer assuring readiness for calibration command.

The SS/FM preflight calibrate-enable signal switches all three SS/FM telemeters to the calibration bus. The sweep generator input provides the ac signal for preflight calibration of the SS/FM telemeters. On the 50M12011-3 and subsequent calibrators, the dummy card provides paths for the preflight ac calibration signals.