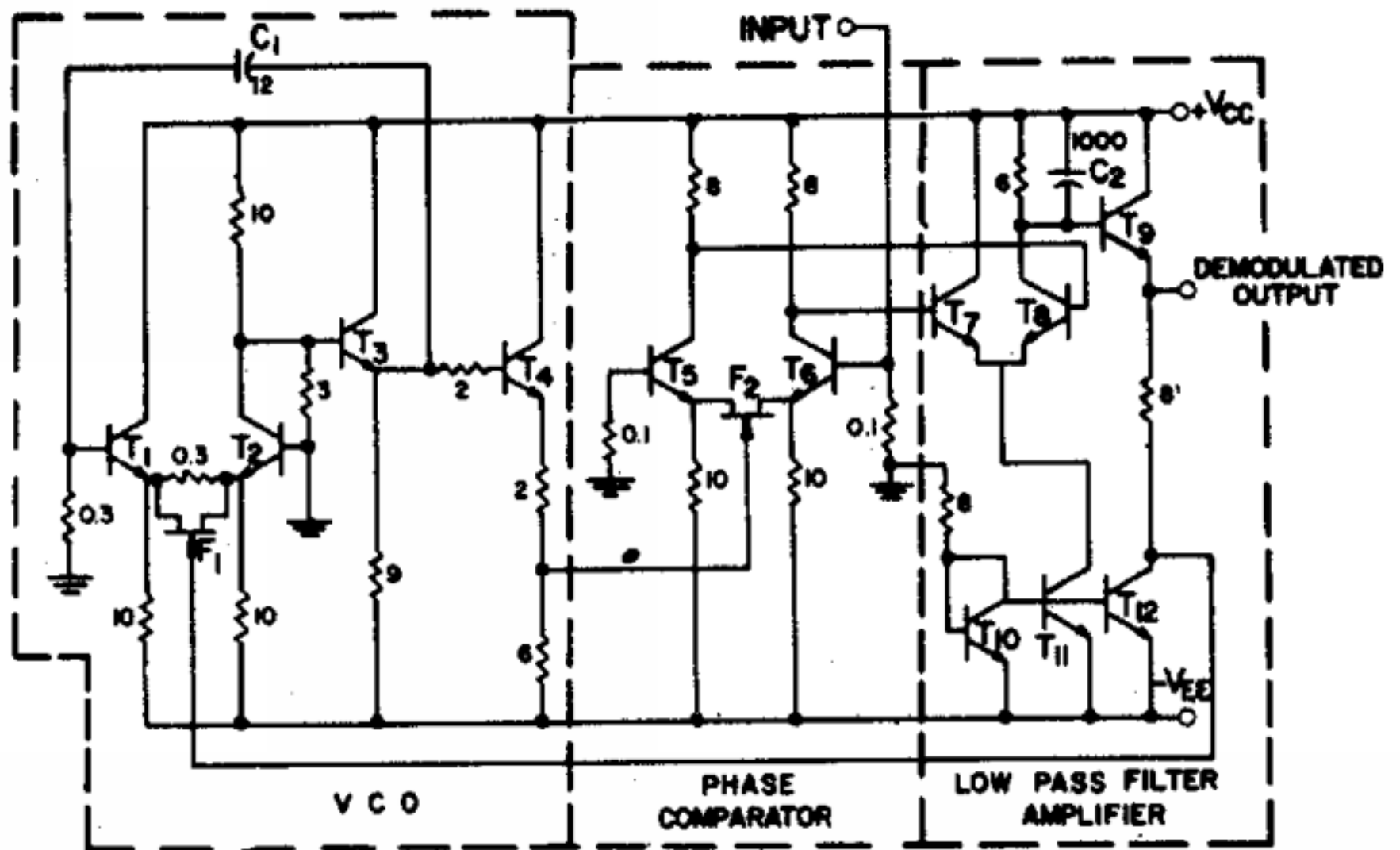


# INTEGRATING THE PHASE-LOCKED LOOP

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## Phase Locking as a New Approach for Tuned Integrated Circuits

JUST AS THE operational amplifier (opamp) is one of the fundamental circuit building blocks for voltage signals, the phase-locked loop (PLL) is fundamental to frequency domain signal processing. Just as integrated circuit technology revolutionized the opamp and made it pervasive, so too did integration open up new doors for the application of PLL techniques. This paper demonstrated the integration of the VCO, phase comparator, and filter amplifier in modest area with reasonable performance.