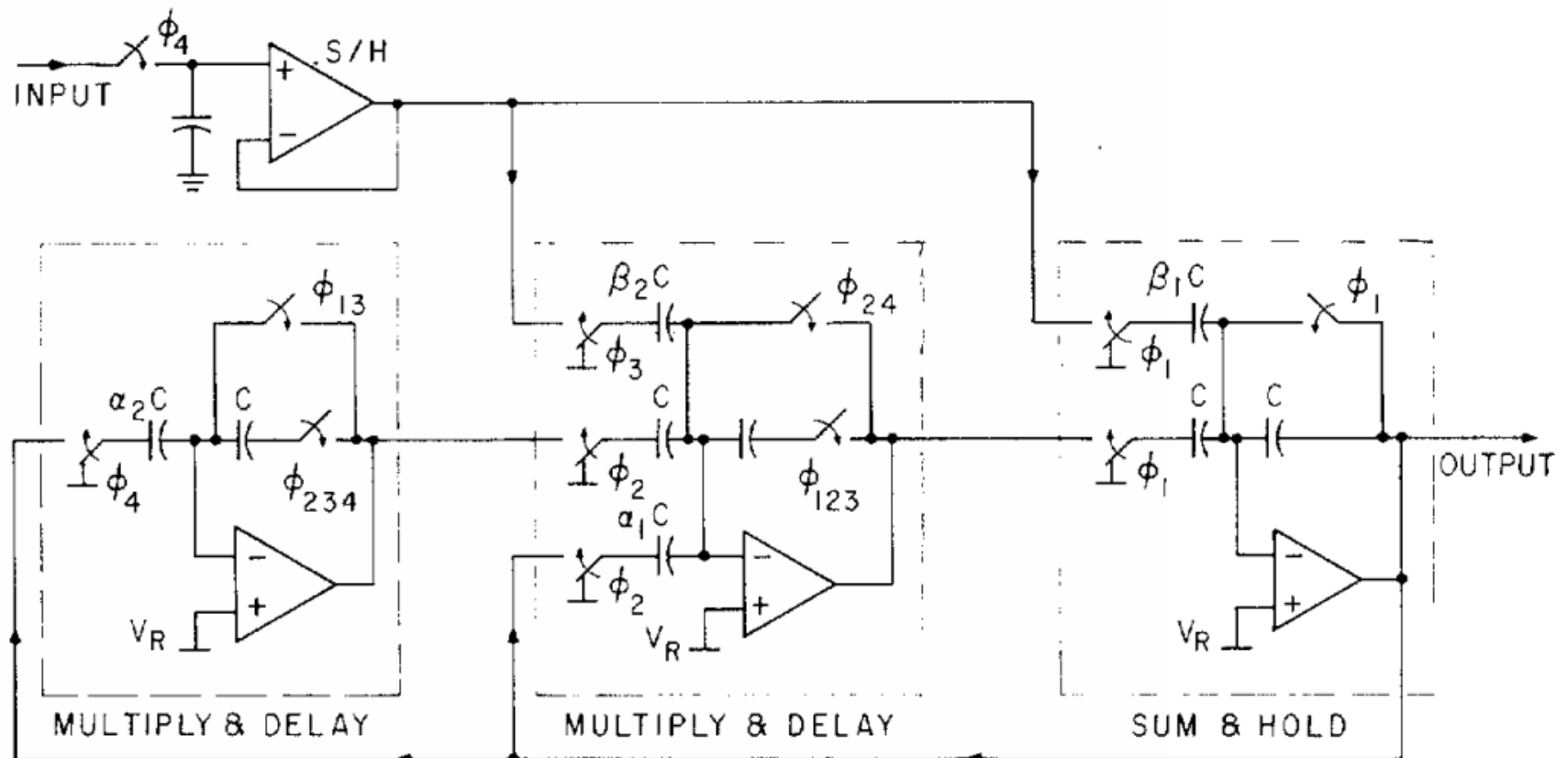


# FIRST SWITCHED-CAPACITOR FILTER IC

ISSCC 1977



## Analog NMOS Sampled-Data Recursive Filter

SINCE MOS TECHNOLOGY provides good switches and high quality capacitors, it is useful to reformulate old problems in a way that is amenable to solution by their use. The paper from 1977 shows that this concept extends even to filter synthesis. A conventional active filter depends on the time constants of RC products. This filter depends on an external reference frequency, which is well controlled (and adjustable to facilitate electronic tuning), and on capacitor matching (ratios accurate to the order of 0.1% are achieved in this paper). Several high-gain (2000), fast settling ( $8\mu\text{s}$  to 0.5%) operational amplifiers are demonstrated for the first time in this paper. Total integration and high performance have made the switched-capacitor filter a valuable functional block in modern communications systems.