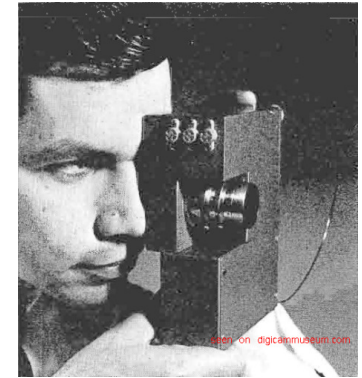


# 1967 - TFT AND TUBELESS CAMERA



*Dr. Paul Weimer (© NAS/NAE)  
First tubeless camera (© RCA)*



*Gene P. Weckler at Fairchild suggested operating p-n junctions in a photon flux integrating mode. The photocurrent from the junction is integrated on a reversebiased p-n junction capacitance. Readout of the integrated charge using a PMOS switch was suggested. The signal charge, appearing as a current pulse, could be converted to a voltage pulse using a series resistor. A 100x 100 element array of photodiodes was reported in 1968. Weckler later called the device a reticon and formed Reticon to commercialize the sensor.<sup>[7b]</sup>*

*Meanwhile, at the RCA Laboratories, P. K. Weimer reported a thin-film transistor (TFT) solid-state image sensor using CdS/CdSe TFTs and photoconductors. The 180x180 element array included self-scanning complementary logic circuitry for sequentially addressing pixels. An experimental television camera incorporating a completely integrated self-scanned solid-state image sensor had already been built in 1966. The integrated sensor included a photosensitive array having 32 400 picture elements, two 180-stage shift register scan generators and associated video coupling transistors. This large-scale integration of more than 100 000 components was carried out in the laboratory entirely by evaporated thin-film techniques. Each element of the photosensitive array comprised one or two photoconductors of CdS or CdS-CdSe mixture, each in series with a diode. The array that was scanned at conventional television scan rates permitted the picture to be displayed upon a commercial television receiver. The camera could be connected to the receiver either through a cable or through a UHF link with camera and transmitter powered by a self-contained battery. Camera circuits other than the integrated sensor employed conventional transistors and integrated components. Dr. Weimer was among the pioneers who developed the "Image Orthicon", a television camera tube that was used for nearly 20 years in the US. After that he did pioneering work in the thin film transistor (TFT) technology and its use in integrated circuits.<sup>[7c]</sup>*