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Selective Video Blanking Technique

An extremely adaptive technique permits selective blanking of specified photosensitive elemental outputs of a solid state imaging mosaic. This selective blanking capability is needed to eliminate randomly spaced "bright spots" occurring in the resulting displayed image. These randomly spaced "bright spots" are caused by imperfections (shorted elements, etc.) occurring within typical large scale integrated semiconductor imaging arrays.

In recent years significant advances have been achieved in the area of solid state imaging using large scale integrated arrays of phototransistors (and diodes) to form the basic optoelectronic imaging plane. Imaging mosaics approximately 0.75 inches square and containing 51,200 phototransistors in a 200x256 matrix form have been developed and tested in a complete imaging system. The imaging quality of these mosaics has been relatively good; however, this performance has been marred by the presence of bright spots (due to randomly spaced shorted elements) on the displayed image. The integrated circuit technology has not advanced to the stage where the yield (good phototransistors vs faulty phototransistor elements) is such that the number of faulty elements can be limited to an extremely small value which does not adversely affect the imaging performance.

The present technique for eliminating the adverse viewing effects caused by faulty photosensitive elements, consists of using a linear maximal (or nonmaximal) sequence generator to generate a pseudo-random pulse train to selectively blank the display monitor during specified mosaic interrogation times. The outputs of two sequence generators (or other combinations) can be used to minimize the length of the required shift register generator. The length of a maximal sequence is given by $L=2^n-1$ where $n =$

number of stages in the shift-register generator. The coded blanking pulse sequence derived from the sequence generator or generators is then combined with the usual horizontal and vertical blanking pulses forming the composite imaging signal. Since the generated code sequence can be made to repeat with a period equal to the basic frame time of the imaging system, this approach to selectively blank out faulty sensing elements is particularly attractive. It is extremely flexible allowing for interchange of different mosaics with different "bright spot" patterns and has the advantage that it can be easily effected by setting of feedback switches. In addition, by the use of a single interconnect pattern (in which the desired sequence generator feedback is set) a unique sequence generator can be fabricated to match the faulty elements of different imaging mosaics if desired.

It is assumed that conventional scanning techniques are used in which the sensed image is divided into a series of "video" lines and later reconstructed to form the displayed image. Individual photo-transistor element selection used in forming each video line is accomplished using a row-column addressing technique to uniquely select each sensing element. Using this addressing scheme a row of photosensitive devices is energized while each column of devices is sequentially activated. Normal scan, interlace scan, or some pseudo-random scan as a reconstruct process can be used.

Notes:

1. In summary, the disclosed technique required considerably less equipment (gating selection, etc.) than would be required if each element output was individually inhibited, and this technique is extremely flexible requiring only the setting of feedback switches when mosaics possessing different "bright spot" patterns are interchanged.

(continued overleaf)

2. No further documentation for this invention is available. Questions may be directed to:
Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B68-10434

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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