San Diego State Astronomy :

Optical and Infrared Camera Electronics

User's Manual

For further information about optical CCD camera electronics and systems contact -
Bob Leach
Dept. of Astronomy, MS 1221
San Diego State University
San Diego CA 92182
(619) 594-1406
FAX: (619) 594-7454
leach@mintaka.sdsu.edu

For further information about infrared camera electronics and systems contact -
Frank Low
Infrared Laboratories, Inc.
1808 17th Street
Tucson AZ 85719
(520) 622-7074
FAX: (520) 623-0765
flow@irlabs.com

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GENERAL INFORMATION

The Astronomy Department at San Diego State University has developed a set of versatile camera electronics designed to control a wide variety of optical and infrared imaging arrays. Originally designed for operating CCDs in a slow scanned readout mode, the electronics have been broadened to operate optical CCDs in a fast readout mode of up to one microsec per pixel that efficiently supports many simultaneous readouts. In conjunction with Infrared Laboratories, Inc. of Tucson AZ two new boards have been developed to operate infrared arrays in this fast readout mode that are suitable for operating HgCdTe, InSb and other infrared arrays. The large dynamic range of CCDs and infrared arrays is maintained through the use of low noise techniques and 16-bit A/D converters. These control-lers are usable for a variety of both optical and infrared image sensors and have been operated by a number of groups the Tucson These   These

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Timing board (parallel cable)	Provides digital timing (or sequencing) signals for controlling the array, and communications with the host computer interface board over a parallel data cable.
Clock driver board	Translates digital timing signals from the sequencer to controlled

for no wait state access by the DSP to supplement its internal memory. A fast fiber optic data link processes commands, generates replies and writes image data to and from the host computer, operating at 4 MHz for receiving incoming commands and 50 MHz for transmitting replies and image data, providing a maximum image data rate of 2.5 megapixels per second, or 400 nanosec per pixel. This will support five readouts at the nominal processing time of two microsec per pixel.

Timing Board (parallel cable)

The parallel cable version of the timing board is similar to the fiber optic version, but instead has support for a 16-bit parallel image data link that transmits over commercially avais Tj tSCSI-3 cable to a host computer interface card for

power monitor of the power control board and by software control from the timing board.

Utility Board

The utility board provides a miscellany of support

with the interface board

256 x 24-bit words X: data space internal, 8k external

256 x 24-bit words Y: data space internal, 16k external

Approx. 80% of the program space, and 60 locations of Y: space, are used up by the current program to control a dual readout