Using the serial ID devices in the VIRUS CCD controller

The major components of the VIRUS controllers and associated parts are equipped with serial ID devices that contain unique serial numbers for the serial ID devices themselves, as well as serial numbers for the components they are attached to. The serial number for the device is contained in a 64-bit read-only-memory written by the manufacturer (Maxim). The serial number for the component is a field contained in the device's programmable memory which is written to during the controller assembly. Both the ROM and the programmable memory can be read by the controller through the host computer. The programmable memory can also be written to by the controller. There are seven of these serial ID devices, as follows:

ARC1215	Timing board
ARC13	Clock driver board
ARC13T	Temperature sensor on the clock driver board
ARC14	Video processor
ARC17	Power control board
ARCFlex	Flex cable
SSA	Spectrograph slot address

The controller finds all active serial ID devices and reads their ROM contents into controller memory with the command 'FAD'. The number of devices found is returned as a reply to this command. Each one is numbered starting at zero in the order in which it was found, which is determined by the serial number in the ROM. Their order will vary considerably from one controller to another. The 8-byte ROM contents are stored in a table in controller memory, and can be read one byte at a time with the command 'ROR' after the desired device is selected by the command 'SDN #', where # is the device number. The contents of the programmable memory can be read with the 'ROM' command, again preceded by the "select device number" command. There are 128 bytes of programmable memory on each device.

Data is written to the programmable memory of the device selected by 'SDN' in 8-byte blocks by the 'WOM' command followed by the block number. As an example, the first four blocks contain data in the following format, all in ASCII:

ARC1215	Component or circuit board name
Rev. 2A	Revision designation
05/12/11	Date of the Revision
S/N 0002	Serial number

The next four blocks contain information about programmable devices on the circuit board, in the format:

U01R2A.0   '01' is the designator of the part on the board, '2A' is the revision number of the board, and "0" is the revision number of the software that the programmable part contains.

The remaining eight blocks are available to the user.

The commands are summarized as follows:

'FAD'   Find active devices. The number is returned as a reply.
'SDN' #   Select the device number # for reading and writing.
'ROR'   Read from the ROM one byte at a time from the 'SDN' device.
'ROM'   Read from programmable memory on byte at a time from the 'SDN' device.
'WOM' block# b0b1b2 b3b4b5 b6b7xx   Write to programmable memory on the 'SDN' device. The bytes are entered three bytes for each argument, with the 'xx' being ignored. Block # is from 0 to 15.

The ROM is programmed by Maxim according to the following format:

The first byte is a code designating the model number of the device. Most of these codes are 0x2D. The temperature sensor code is 0x22.
The next six bytes are unique numbers that appear to increment as the parts are manufactured.
The last byte is a cyclic redundancy code (CRC) calculated from the preceding seven bytes.