

# FEATURES

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## Range Data

### RANGE DATA APPLICATIONS:

Applications that benefit most from Range Data include:

- Missile and spacecraft launches
- Outdoor ranges
- Ballistics
- Any application where object tracking is required

### INTRODUCTION:

The Range Data feature provides a mechanism that can be used to tag image frames with data supplied over the range data interface. This mechanism is an extension of the time stamp storage system; range data tags are treated very much like timestamps and the event signal.

While primarily intended for acquisition of altitude/azimuth/range information from tracking mounts, the range data input does not impose any formatting on the actual data recorded; as such, it can be used to record arbitrary digital data, of up to 128-bits/frame.

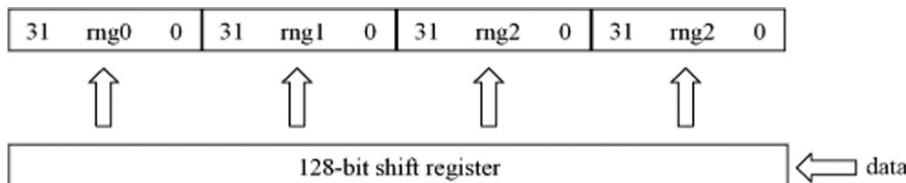
### GENERAL OPERATION:

At the end of the exposure of each frame, (the moment time stamps are recorded), a 4  $\mu$ s correlation pulse is output. After the end of correlation pulse, the data line will be in the idle state for a period not exceeding 100 $\mu$ s, followed by a 32 or 64 bit preamble, used to synchronize the receiver clock, and 128 bits of data.



After the preamble is detected, the 128 data bits following are shifted into a shift register. On the rising edge of the next correlation pulse, the data from the shift register is combined with the current time, and sent to the recording system. After that, the shift register is cleared and made ready for shifting in more data.

The range data acquired for each frame is stored in four 32-bit words inside the time stamps. This serial data stream is mapped as shown in below:



The recorded 128 data bits typically contain time, azimuth, elevation, range, and status information. The camera does not interpret the data fields in any way.

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### IMPORTANT OPERATION NOTES:

Range Data parameters can only be specified using the Phantom Camera Control software. It is not yet supported in the PCC (Phantom Camera Control) application.

Range Data supports two protocols; Az24E124 or MLAIR.

This feature does not apply to all Phantom camera models and must be special ordered.

The space for storing range data stamp is allocated when the camera memory is partitioned. For some combinations of camera memory size and resolutions, storage limitations may make storage of range data stamp impossible: this will happen when the largest sizes of camera memory are used with small frame sizes. In these cases, because of the excessive storage requirements, range data recording will be disabled.

### Focused

Since 1950, Vision Research has been shooting, designing, and manufacturing high-speed cameras. Our single focus is to invent, build, and support the most advanced cameras possible.



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The range data stamp stored for each frame is the one that has been clocked since the end of exposure of the previous frame. If no data is clocked for a specific frame, the range data words will all be zero.

### HOW TO SPECIFY RANGE DATA SETTINGS:

The following procedure describes the steps necessary to define the Range Data parameters:

1. Start the Phantom (Phantom Camera Control) software.
2. Open the Acquisition pull-down menu.
3. Select the Camera Pool... command from the Acquisition menu, then
4. Select the Phantom camera for use in the Camera Pool dialogue window.
5. Re-open the Acquisition pull-down menu, then
6. Select the Camera Options command.
7. Click the down arrow to the right of the Range Data entry field and select the desired range data protocol, (Az24E124 or MLAIR).
8. Click the Update button to accept Camera Option changes, or click the Cancel button to ignore the changes.
9. Click OK when finished.

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