always be ready to receive the next byte. In general, using binary transfers on the RS232 interface is not recommended.

The parameter i selects the display buffer (i=1, 2) and is required. Points are read from the buffer starting at bin j (j≥0). A total of k bins are read (k≥1) for a total transfer of 4k bytes. To read a single point, set k=1. Both j and k are required. If j+k exceeds the number of stored points (as returned by the SPTS? query), then an error occurs. Remember, SPTS? returns N where N is the total number of bins - the TRCB? command numbers the bins from 0 (oldest) to N-1 (most recent). If data storage is set to Loop mode, make sure that storage is paused before reading any data. This is because the points are indexed relative to the most recent point which is continually changing.

FAST (?) {i}

The FAST command sets the fast data transfer mode on and off. The parameter i selects On (i=1) or Off (i=0). When the fast transfer mode is on, whenever data is sampled and stored, the values of X and Y are automatically transmitted over the GPIB interface (this mode is not available over RS232). The sample rate sets the frequency of the data transfers. It is important that the receiving interface be able to keep up with the transfers. FAST only sends data when data is being stored. If the storage buffer is single-shot and full, then no data will be transferred.

The values of X and Y are transferred as signed integers, 2 bytes long (16 bits). X is sent first followed by Y for a total of 4 bytes per sample. The values range from -32768 to 32767. The value ±30000 represents ±full scale (i.e. the sensitivity).

Offsets and expands are included in the values of X and Y. The transferred values are (raw data - offset) x expand. The resulting value must still be a 16 bit integer. The value ±30000 now represents ±full scale divided by the expand factor.

At fast sample rates, it is important that the receiving interface be able to keep up. If the SR830 finds that the interface is not ready to receive a point, then the fast transfer mode is **turned off**.

The fast transfer mode may be turned off with the FAST0 command.

Make sure that the SR830 transmit buffer is empty by doing a dummy query before a FAST transfer (for example, send SPTS? and read the answer and ignore it). The transfer mode should be turned on (using FAST1) before storage is started. Then use the STRD command (see below) to start data storage. After sending the STRD command, immediately make the SR830 a talker and the controlling interface a listener. Remember, the first transfer will occur with the very first point.

STRD

After using FAST1 to turn on fast data transfer, use the STRD command to start the data storage. STRD starts data storage after a delay of 0.5 sec. This delay allows the controlling interface to place itself in the read mode before the first data points are transmitted. **Do not use the STRT command to start the scan.** See the programming examples at the end of this section.