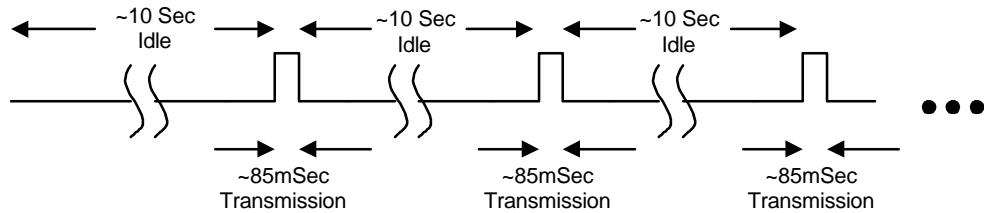


1. Bracelet Transmissions

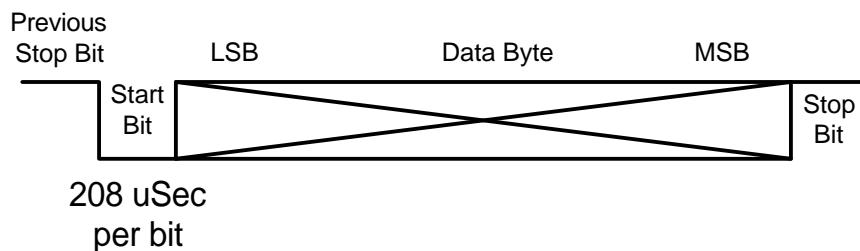
1.1. Transmission Timing

The bracelet packet consists of 7 bytes of data plus one SYNC byte, (as discussed in section 3 below). Each transmission consists of 5 repeats of the bracelet packet and then 10 seconds of *quiet*.



1.2. Asynchronous Communication

All data bytes are transmitted from the bracelet with the addition of asynchronous Start and Stop bits. The data is transmitted at 4800 Baud, with 1 start and 1 stop bit (as shown below).



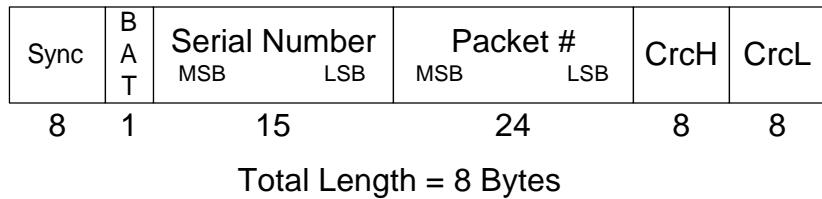
1.3. Packet Repeats

During each transmission, the packet is repeated 5 times as shown below. Note the addition of a SYNC byte at the end of the 5 SYNC/Packet transmissions.

| SYNC | Packet Data | SYNC |
|--------|-------------|--------|-------------|--------|-------------|--------|-------------|--------|-------------|--------|
| 1 Byte | 7 Bytes | 1 Byte |

Bracelet Protocol

The bracelet packet consists of the following information (note that the SYNC is not *actually* part of the packet):



1.4. Sync

The SYNC byte is a single byte of data and always contains the value 0xC3 (binary: 1100 0011).

The receiver constantly looks for the 7 information bytes between two SYNC bytes.

1.5. BAT

Bat is a status bit indicating the health of the bracelet battery. If the Bat bit is a 0, then the battery level is acceptable. A 1 indicates that the hardware is reporting low battery.

1.6. Serial Number

Each bracelet is assigned a unique bracelet serial number. This number is permanently burned into the object file (loaded on each bracelet). It is both Manufacturing and Configuration Control's responsibility to assure that no two bracelets have the same serial number.

1.7. Packet Number

The Packet Number is a monotonically increasing number that increments by 1 after each transmission. Thus this can be construed as an approximate 10 Second counter. This Packet Number would theoretically wrap every 5+ years, and since the battery should only last around 3 years, the Packet Number should never wrap.

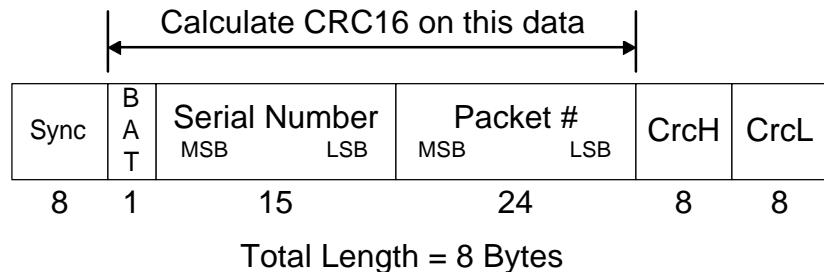
This Packet Number is reset to its initial value under the condition that the bracelet strap is removed (this is an indicator that a bracelet strap tamper occurred).

If the bracelet hardware ever indicates that the bracelet strap is removed, then the software should immediately reset this packet number. It should remain reset as long as the bracelet strap tamper is detected.

Upon reset, the Packet Number is reset to some fixed value. The value is hardcoded into the software and corresponds to the version of the firmware loaded in the PIC uP. The first version of the firmware, upon reset, will set this Packet Number to 1. The next version of the firmware, upon reset, will set the Packet Number to 3, and so on. All Packet Number reset values will always be odd numbers.

1.8. CRC

The CRCH and CRCL (MSB and LSB) represent a 16 bit CRC of the data transmitted. The CRC is calculated on the Battery Status, Serial Number, and Packet Number as shown below:



The CRC algorithm that is used to generate the 16 bit CRC, is shown in the appendix below. Note that the CalculateCRC16(...) function initializes the CRC value to 0xFFFF and that it pushes two bytes of 0's through after the packet (this is necessary due to the small number of bytes being processed).

Analyzer Output

