**To calculate the checksum we follow the format as listed on the document  
  
Example:** Sending NAV Radio, active frequency of 108.00:

**Start:** $

**Proprietary id:** P

**Company id:** MRR

**Class id:**V for VHF NAV as supported by SL40 VHF Comm Radio Serial Interface.

**Message id:** 27

**Data** (frequency)**:** mk where m = Mhz and k =KHz

For MHz part of the tuned frequency

The conversion is m– 30h

m=108

108 – 30h (converting 30H to decimal)

108 – 48(decimal) = 60(decimal)

Converting 60(decimal) to Hex (h)

60(decimal) =3Ch

Converting 3Ch to ASCII

3Ch= < (ASCII)

Similarly for KHz of the tuned frequency

k+30h

k = 00

00 + 30h =30h or 0 (ASCII). Therefore the frequency is = 0(ASCII)

**Data** (receiver function)**:** N

**Checksum**: Is the decimal\* sum of all values from message id (nn) until data end (d…d). The resulting sum is converted to a hex number. The carry if any is ignored and the remaining hex number is encoded by adding 30h to each hex number. The each hex number is then converted to its corresponding ASCII character and this is the checksum.

\*It may be noted that the values from the message id (nn) to the data end (d…D) are in ASCII and have to be converted to their decimal value for adding.

From the example the two encoded hex characters are formed by first adding the decimal value of the ASCII characters ‘2’ + ‘7’ + ‘<’ + ‘0’ + ‘N’.

These ASCII character are first converted to their decimal value

50 + 55 + 60 + 48 + 78 = 291

The decimal number 291 is then converted to it hex value 123h

Ignoring the carry, only 23h remains.

The hex number 23h is converted to encoded hex by adding 30H to both 2h and 3h

Therefore 2h+30h = 32h and 3h+30H = 33h respectively

The ASCII equivalent of 32h is ASCII 2 while the ASCII equivalent of 33h is ASCII 3 respectively.

Therefore the checksum is 23.

**Carriage return and line feed:** ‘\r’ and ‘\n’.

The Final Message is **$PMRRV27<0N23\r\n**

(\r and \n aren’t visible normally just here to show that they are a part of the message).