BBV RS422 Telemetry Control Protocol

This document describes the protocol used to drive RX457, RX557 and BBV StarCard Converters.

Baud Rate: 9600
Parity: None
Data Bits: 8
Stop Bits: 1

The protocol is designed as a single direction, multi-drop RS422 protocol. The RX457, AC telemetry receiver and RX557, DC telemetry receiver will be able to provide positional information that will require a separate data pair.

Each command comprises of 8 bytes as follows:
Byte 1 - BBV STX (0xB0)
Byte 2 – Address (0 – 95) 0 = address 1, 95 = address 96
Byte 3 – Described Below
Byte 4 – Described Below
Byte 5 – Described Below
Byte 6 – Described Below
Byte 7 – BBV ETX (0xBF)
Byte 8 – Checksum (XOR of Bytes 1, 2, 3, 4, 5, 6 & 7)

There are two types of command; manual movement commands and additional commands. Byte 4 bit 0 is used to select the command type. Manual commands are selected when Byte 4 bit 0 is 0 and additional commands are selected when Byte 4 bit 0 is 1.

Manual Movement Commands – Byte 4 bit 0 = 0

Byte 3 Bit 7 – ALWAYS 0
Bit 6 – Future Expansion
Bit 5 – Future Expansion
Bit 4 – Future Expansion
Bit 3 – IRIS CLOSE
Bit 2 – IRIS OPEN
Bit 1 – FOCUS FAR
Bit 0 – FOCUS NEAR

Byte 4 Bit 7 – ALWAYS 0
Bit 6 – ZOOM OUT (WIDE)
Bit 5 – ZOOM IN (TELE)
Bit 4 – TILT DOWN
Bit 3 – TILT UP
Bit 2 – PAN LEFT
Bit 1 – PAN RIGHT
Bit 0 – ALWAYS 0 FOR MANUAL COMMANDS

Byte 5 Pan Speed, 0x00 – 0x40, 0x00 = SLOWEST, 0x40 = FASTEST
Byte 6 Tilt Speed, 0x00 – 0x3F, 0x00 = SLOWEST, 0x3F = FASTEST

Additional Commands – Byte 4 bit 0 = 1

To select an additional command instead of a manual command Byte 4 bit 0 must be set to 1. The following table indicates the commands possible and the Byte values.

COMMAND	BYTE 3	BYTE 4	BYTE 5	BYTE 6
SAVE PRESET	0x00	0x03	0x00	0x01 – 0x20 (1 – 32)
ERASE PRESET	0x00	0x05	0x00	0x01 – 0x20 (1 – 32)
GO TO PRESET	0x00	0x07	0x00	0x01 – 0x20 (1 – 32)
LIGHTS RELAY ON	0x00	0x09	0x00	0x01 (auxiliary 1 ON) (see notes for 24June04 on page 3)
LIGHTS RELAY OFF	0x00	0x0B	0x00	0x01 (auxiliary 1 OFF) (see notes for 24June04 on page 3)
WIPER RELAY ON	0x00	0x09	0x00	0x02 (auxiliary 2 ON)
WIPER RELAY OFF	0x00	0x0B	0x00	0x02 (auxiliary 2 OFF)
WASH RELAY ON	0x00	0x09	0x00	0x03 (auxiliary 3 ON) (see notes for 24June04 on page 3)
WASH RELAY OFF	0x00	0x0B	0x00	0x03 (auxiliary 3 OFF) (see notes for 24June04 on page 3)
AUTOPAN ON	0x00	0x07	0x00	0x63 (goto preset 99)
AUXILIARY ON	0x00	0x09	0x00	0x01 – 0x08
AUXILIARY OFF	0x00	0x0B	0x00	0x01 – 0x08
ZOOM LENS SPEED	0x00	0x25	0x00	0x00 – 0x03
DISPLAY MENU TX1500 1 #	0x00	0x03	0x00	0x5F (SAVE PRESET 95)
TX1500 2 #	0x00	0x07	0x00	0x21 (GO TO PRESET 33)
TX1500 3 #	0x00	0x07	0x00	0x5E (GO TO PRESET 94)
TX1500 4 #	0x00	0x0F	0x00	0x00
RUN PATROL 1	0x00	0x07	0x00	0x61 (GO TO PRESET 97)
RUN PATROL 2	0x00	0x07	0x00	0x62 (GO TO PRESET 98)
AUTOPAN	0x00	0x07	0x00	0x63 (GO TO PRESET 99)
*REPORT POSITION	0x00	0x03	0x00	0x63 (SAVE PRESET 99)

The REPORT POSITION command is intended to be used to allow the RX457 or RX557 to report back the current pan/tilt/zoom and focus preset positions when installed with a preset pan/tilt head and lens. Each position will give a value between 0 and 1023 depending on the limit stop positions and pan/tilt and lens type.

This feature is not currently supported however the proposed response would be.

0xB0, ADDRESS, PAN HIGH, PAN LOW, TILT HIGH, TILT LOW, ZOOM HIGH, ZOOM LOW, FOCUS HIGH, FOCUS LOW, 0xBF, CHECKSUM

Each value will be sent as two bytes with bit 7 = 0 as shown in the example for Pan Positions.

PAN LOW Bit 7 = 0
Bit 0 – 6 = bits 0 – 6 of value

PAN HIGH Bit 7 = 0
Bit 0 – 2 = bits 7 – 9 of value

The Checksum will be the XOR of all bytes from 0xB0 to 0xBF

Revision changes:
24June04 – WASH and LIGHTS auxiliary numbers have been swapped as the previous document was in error. LIGHTS should be auxiliary 1 and WASH should be auxiliary 3.