Comparison of TASS and D Protocol

Objective: Based on SMR 1-QVIN, our task is to modify the receiver to accept the U.S. Air Force TASS Protocol. This document specifies the similarities and differences of the two protocols for the main camera commands and functions. It is a short summary of the highlighted portion in the attached tables.

Header (Blue):

- D – Only 2 bytes.
- TASS – 6 bytes long (lots of overhead)

Commands (Yellow):

- D – 4 bytes to specify commands and data.
  - One message to specify **all** non-extended commands.
  - Single messages for extended commands.
- TASS – 2 bytes to identify single commands and 7 bytes to detail extended commands.
  - One message per single non-extended command. Must wait for an ACK before sending another command.
  - Extended commands are sent in conjunctions of two.

Non-Extended Commands:

Pan and Tilt Commands (Yellow) and Speed (Green):

- D – Can specify pan and tilt direction (left/right) along with speeds for both ranging from 0x00 to 0x3F (high speed) and 0x40 for "turbo" speed only for panning.
- TASS – Must send desired pan or tilt speed command before pan or tilt direction (left/right) command otherwise camera will initially move at default speed. Pan and tilt speeds range from 0 to F.
  - TXB translator will need to remember speed for next pan or tilt command.
  - Will keep going until given stop command.
  - NOTE: Some extra conversion must be done for the speed translations.

OR Joystick Control (Yellow):

- TASS – Allows specification of Pan and Tilt directions along with their speeds respectively in one message. ONLY under joystick command.
  - 1 byte for each direction and 2 bytes for each speed

Zoom and Focus Command (Yellow) and Speed (Green):

- D – Can specify zoom (wide/tele) and focus (near/far) direction in one command. You can set the desired speed (00 – 03) using a specific extended command for each function.

- TASS – Lens speed (slow/fast) must be specified first for zoom and focus desired speed in a single command then the direction of zoom (out/in/stop) or focus (near/far/stop) in separate commands for each.
    - NOTE: Only Slow or Fast speed (nothing in between).
    - NOTE: It does not appear that the TASS protocol allows for the ability to enable/disable AUTO FOCUS functionality in the receiver.
    - NOTE: It is not clear what the "Lens speed" command controls:
        - Does it set the speed for both the focus and zoom manual lens control or only zoom (only focus?) ?

Extended Commands:

Position Commands (Purple):

- D – 2 bytes to set position for pan, tilt, and zoom.
    - Position is given in hundredth of a degree and ranges from 0 to 35999 (decimal) for pan and tilt.
    - Zoom position is given as a ratio based on the device's Zoom Limit setting.
- TASS – 3 bytes to set position for pan, tilt, zoom, and focus.
    - Position is given in 12 bits but mapping to pan and tilt position angles is device dependent.
    - Zoom and focus positions are specified to have up to a 12-bit resolution.

Preset Commands (Pink):

- D – Minimum 32 Presets with set, clear, and go-to functions.
    - Presets for Alarms, scan modes, and general user defined positions.
- TASS – Minimum 10 Presets with only set and go-to functions.
    - Presets for scan modes and general user defined positions only.
    - NO information on alarm presets.

NOTE: All other commands were not documented due to either having similar message formats or having no correlation to the D protocol. Only main functions for the camera were identified for comparison purposes.