#### ICD for CDU:

This document define the Interface Specification between the CDU (Command and Display Unit) and different RCP (Remote Control Panel) for ADF, TACAN and NAV/COM Receiver.

The CDU is connected to RCPs using the 1553-B Aviation Multi-Drop Master-Slave Bus. Which is transparent for this ICD, and it assumes a direct connection to all RCPs. However, as the physical port is same, there is a Equipment Identifier that defines, the source / destination of each input / output message.

**Message Formats:**

All messages will conform to the NMEA 0183 proprietary message format, without delimiter, as follows. All characters will be standard ASCII characters. No binary data characters will be used. Each message can be identified by Equipment Identifier, Message Class Identifier and Message Identifier. All messages are fixed length messages, however the length of different message may differ as the message data characters may be different. Message Always Start wit “$” and end with <CR><LF> sequence.

|  |  |
| --- | --- |
| “$” | Start of message character, ASCII “$” (024h) |
| “P” | Proprietary message identifier |
| “AT” | AeroTrain identifier |
| E | Equipment Identifier “A” for ADF, “T” for TACAN, “N” for NAV, “C” for COM |
| c | Message class identifier. “C” or “V”. |
| nn | Message identifier, two-digit number in ASCII characters. |
| d..d | Message data characters defined for each message. |
| chksum | Message checksum. |
| <CR> | ASCII carriage return (0Dh) |
| <LF> | ASCII line feed (0Ah) |

The maximum message length, including the start of message character (“$”) and the end of message

<CR><LF> sequence, is 32 bytes.

**Data Format:**

* Baud rate 9600
* Data bits 8
* Stop bits 1
* Parity none

**Transceiver(COM 2kR):**

COM Transceiver from VAL Avionics is one equipment that can be be connected to CDU through respective RCP. It has one UART through which it connects to RCP, and the Interface Specification of this port is defined in the installation manual of the COM 2kR. The RCP is connected to 1553 Bus using another UART, whose specification is given as below.

**IN/OUT MESSAGES:**

As the configuration changed at CDU is to be communicated to the RCP and vice versa, these messages are used as input as well as outputs.

**Message 42: (SET ACTIVE COMM FREQUENCY AND TRANSCEIVER FUNCTION)**

This **Output message** is used to set the Active COMM frequency as well as he COMM transceiver function.

**Message format:**

|  |  |
| --- | --- |
| “V” | Message class. This is a VHF NAV message |
| “42” | Message identifier |
| mk | Active COMM frequency: [m = MHz, k = KHz] |
| a | Transceiver function: N = normal, 0 = unchanged |

**Example message:** $PATCV42G4N<chksm><CR><LF> [mk=119.100MHz, a = Normal]

**Message 29: (SET STANDBY COMM FREQUENCY AND TRANSRECEIVER FUNCTION)**

This **Output message** is issued to set the standby COM frequency.

**Message format:**

|  |  |
| --- | --- |
| “V” | Message class. This is a VHF NAV message |
| “29” | Message identifier |
| mk | Standby COMM frequency: [m = MHz, k = KHz] |
| a | Transceiver function: N = normal, 0 = unchanged |

**Example message:** $PATCV29G4N<chksm><CR><LF> [mk=119.100MHz, a = Normal]

**Message 71: (VOLUME AND SQUELCH SETTING)**

This **Output message** is used to adjust the volume and squelch levels of the COM unit

**Message format:**

|  |  |
| --- | --- |
| “V” | Message class. This is a VHF NAV message |
| “71” | Message identifier |
| vs | Volume level and Squelch Level |

**Example Message:** $PATCV71;?<chksum><CR><LF>

This example command would set the volume level at 11 and the squelch at 15.

**Message 72: (MIC GAIN AND SIDETONE CONTROL)**

This **Output message** is used to adjust the volume and squelch levels of the COM unit

Message format:

|  |  |
| --- | --- |
| “V” | Message class. This is a VHF NAV message |
| “72” | Message identifier |
| ms | MIC Gain and Sidetone |

**Example Message**: $PATCV72;?<chksum><CR><LF>

This example command would set the mic gain level at 11 and the sidetone at 15.

**INPUT MESSAGE:**

**Message 35: (COM TRANSCEIVER STATUS)**

This message is used to output the current status of the COM Transceiver

**Message format:**

|  |  |
| --- | --- |
| “V” | Message class. This is a VHF NAV message |
| “35” | Message identifier |
| mk | Active frequency: m = MHz, k = kHz |
| mk | Standby frequency: m = MHz, k = kHz |
| a | Transceiver status: R = Normal receive, T = Transmit enabled, S = Stuck mic, F = Comm failure |
| s | Squelch test setting: (ASCII) 0 = automatic; 1 = test |

**Example message:** $PATCV35G4LFR0<chksm><LF>

Active frequency is 119.100 MHz, the standby frequency is 124.550 MHz, receiver function, squelch is automatic.

**NAV(NAV2000R):**

NAV Receiver from VAL Avionics is one equipment that can be be connected to CDU through respective RCP. It has one UART through which it connects to RCP, and the Interface Specification of this port is defined in the installation manual of the NAV 2kR. The RCP is connected to 1553 Bus using another UART, whose specification is given as below.

**IN/OUT MESSAGES:**

**Message 27: (SET ACTIVE VOR/LOC FREQUENCY AND RECEIVER FUNCTION)**

This message is used to set the standby VOR or Localizer frequency as well as the receiver operating function.

**Message format:**

|  |  |
| --- | --- |
| “V” | Message class. This is a VHF NAV message |
| “27” | Message identifier |
| mk | Active VOR/LOC frequency: m = MHz, k = kHz. |
| a | Receiver function: N = normal, 0 = unchanged. |

**Message format:** $PATNV27E4N<chksm><CR><CR><LF> [mk = 117.100 MHz, a = Normal]

**Message 28: (SET STANDBY VOR/LOC FREQUENCY AND RECEIVER FUNCTION)**

`This message is used to set the standby VOR or Localizer frequency as well as the receiver operating function.

**Message format:**

|  |  |
| --- | --- |
| “V” | Message class. This is a VHF NAV message |
| “28” | Message identifier |
| mk | Standby VOR/LOC frequency: m = MHz, k = kHz. |
| a | Receiver function: N = normal, 0 = unchanged. |

**Example message:** $PATNV28?PN<chksm><CR><LF> [mk = 111.800 MHz, a = Normal]

This command would also set the receiver function to normal, so the receiver would receive only the active VOR channel.

**Message 34: (SET NAV OMNI-BEARING SELECT (OBS) VALUE)**

This message is used to set the OBS value used by the NAV 2000 as the elected radial for computing the course deviation from a VOR.

**Message format:**

|  |  |
| --- | --- |
| “V” | Message class. This is a VHF NAV message |
| “34” | Message identifier |
| vvv | OBS Value in degrees, ranging from “000” to “359”. |

**Example message:** $PATNV34310<chksm><CR><LF> [Set the OBS value to 310 degrees]

**Message 73: (NAVIGATION VOLUME CONTROL)**

This message is used to adjust the volume level of the NAV unit.

**Message format:**

|  |  |
| --- | --- |
| “V” | Message class. This is a VHF NAV message |
| “73” | Message identifier |
| v | Volume Level |

**Example Message:** $PATNV73;<chksum><CR><LF> [set the volume level at 11]

**INPUT MESSAGE:**

**Message 35: (NAV RECEIVER STATUS)**

This message is used to output the current status of the NAV receiver. It will be output upon

request or whenever the status changes.

**Message format:**

|  |  |
| --- | --- |
| “V” | Message class. This is a VHF NAV message |
| “35” | Message identifier |
| mk | Standby NAV frequency: m = MHz, k = kHz. |
| s | Status: “N” = Normal mode, “M” = Monitor mode |

**Example message:** $PATNV28E4?PM<chksm><CR><LF>

Active NAV frequency is 117.100 MHz, Standby NAV frequency is 111.800 MHz, receiver is in monitor mode.

**TACAN(KTU-709):**

**IN / OUT MESSAGES:**

**INPUT MESSAGE:**

**ADF(KDF-806):**

**IN / OUT MESSAGES:**

**INPUT MESSAGE:**