Dynon Radios LLC
19825 141st PI NE
Woodinville, WA 98072
Ph:(425) 402-0433
Fax: (425) 984-1751

SV-COM-425 User Manual

The SV-COM-425 is a remotely controlled VHF communications transceiver. All functions are controlled using a binary protocol over a serial RS-232 data link. The user will require a SV-COM-450 panel mounted control head to control this transceiver.

Installation:

The SV-COM-425 transceiver is intended to be bolted or riveted onto the structure of the user's aircraft. The supplied harness connects the SV-COM-425 to the SV-COM-450 control head. Power for both the units should be connected to the Red wire in the harness, and the Black wire should go to the bus power's return point.

Serial Protocol:
  8 bit binary
  1 stop bit
  odd parity
  38,400 Baud

Electrical Interface:

15 pin male DSUB-15 connector

Pin	Description	Pin	Description
1	Microphone, audio input	9	Ground
2	Ground	10	Audio out
3	Enable, ground to activate power	11	Ground
4	Ground	12	Ground
5	Push To Talk, ground to transmit	13	Ground
6	RS-232 TX out of Unit	14	RS-232 RX in to Unit
7	Supply Voltage	15	Ground
8	Supply Voltage		

Power Requirements:

A positive supply of 10.0 up to 30.0 Volts.
Receiving: 200 mA
Transmitting: 3.0 Amps

Environmental: -20°C to +60°C (-4°F to 140°F) Ambient temperature

Audio Requirements:

        Microphone: 150 Ohms nominal input impedance
                              70 mV RMS for 70% modulation
                              Maximum input 2.0 V peak to peak

        Headphone: 150 Ohms nominal output impedance
                              150 mW output power into 150 Ohms
                              Short circuit protected.

Transmitter:

Class	4
Output Power	6 Watts minimum at 10.0 VDC
Duty cycle	20%
Frequency range	118.000 to 136.975 MHz
Audio Frequency response	200 to 3.0 KHz
Frequency tolerance	+/- 5 PPM from –20C t0 +60C
Modulation capability	85 % maximum
Audio distortion	< 10%
Carrier noise level	> 35 dB down
Side-tone level	up to 150 mW into 150 Ohms
Stuck microphone timeout	31 to 34 seconds
Antenna Requirements:	50 Ohms impedance, BNC connector
	VSWR less than 2.5 : 1

Receiver:

Class	D
Frequency range	118.000 to 136.975 MHz
Audio Frequency response	150 to 3.0 KHz
Frequency tolerance	+/- 5 PPM from –20C t0 +60C
Selectivity	> 60 dB at +/- 25 KHz
Squelch	Automatic, -1 µV setpoint

Appendix 1   **User Mode Serial Commands**

Description of Data frames				

Get Mode (1 byte)				
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x50	TYPE_GET_VHF_MODE	

Mode (2 bytes)					
Frame	Name	Description		C code name	Comments
Byte 1	Type	0x51		TYPE_VHF_MODE	
Byte 2	Mode bit flags	*Rest of bits*		*Reserved*	
		Warning	BIT4	status_flags	
		PTT2	BIT3		*not used*
		PTT1	BIT2		
		RX Scnd	BIT1		
		RX Prim	BIT0		

Set VHF Channels (5 bytes)					
Frame	Name	Description		C code name	Comments
Byte 1	Type	0x52		TYPE_SET_VHF_CHANNELS	
Byte 2	Primary MSB	UINT8	UINT16	prim_chan_idx	index number is split into 2 bytes: 0 < index <3036
Byte 3	Primary LSB	UINT8			
Byte 4	Secondary MSB	UINT8	UINT16	scnd_chan_idx	index number is split into 2 bytes: 0 < index <3036
Byte 5	Secondary LSB	UINT8			

Set VHF Mode and Volume (3 bytes)					
Frame	Name	Description		C code name	Comments
Byte 1	Type	0x53		TYPE_SET_MODE_VOLUME	
Byte 2	Bit flags	*Rest of bits*		radio_mode	*Reserved*
		Dual Watch	BIT1		
		Unsquelch	BIT0		
Byte 3	Volume	UINT8		radio_vol	0 < radio_vol < 255

Set Sidetone (2 bytes)				
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x56	TYPE_SET_SIDETONE	
Byte 2	Volume	UINT8	sidetone_vol	0 < sidetone_vol < 255

Get VHF Channels (1 byte)				
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x57	TYPE_GET_VHF_CHANNELS	

VHF Channels (5 bytes)					
Frame	Name	Description		C code name	Comments
Byte 1	Type	0x58		TYPE_VHF_CHANNELS	
Byte 2	Primary MSB	UINT8	UINT16	prim_chan_idx	index number is split into 2 bytes: 0 < index <3036
Byte 3	Primary LSB	UINT8			
Byte 4	Secondary MSB	UINT8	UINT16	scnd_chan_idx	index number is split into 2 bytes: 0 < index <3036
Byte 5	Secondary LSB	UINT8			

	Get VHF Warnings (1 byte)			
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x59	TYPE_GET_VHF_WARNING	

	VHF Warning (2 bytes)			
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x5A	TYPE_VHF_WARNING	
Byte 2	Warnings	UINT8	warning	refer to the warning index list

	Get VHF Version (1 byte)			
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x5B	TYPE_GET_VHF_VERSION	

	VHF Version (7 byte)			
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x5C	TYPE_VHF_VERSION	
Byte 2	H/W Major	UINT8	HW_MAJOR	
Byte 3	H/W Minor	UINT8	HW_MINOR	
Byte 4	F/W Major	UINT8	FW_MAJOR	
Byte 5	F/W Minor	UINT8	FW_MINOR	
Byte 6	S/W Major	UINT8	SW_MAJOR	
Byte 7	S/W Minor	UINT8	SW_MINOR	

	Set Squelch (2 bytes)			
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x5E	TYPE_SET_SQUELCH	
Byte 2	Squelch	UINT8	squelch	0 < squelch < 255

Get Serial Number (1 byte)				
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x63	TYPE_GET_SERIALNB	

Serial Number (3 bytes)					
Frame	Name	Description		C code name	Comments
Byte 1	Type	0x64		TYPE_SERIALNB	
Byte 2	Number MSB	UINT8	UINT16	Cal_SerialNumber	
Byte 3	Number LSB	UINT8			

Appendix 2   **Confidential Test Serial Commands**

Set Mic (2 bytes)				
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x5F	TYPE_SET_MIC	
Byte 2	Mic	UINT8	micLevel	0 < micLevel < 255

Get Pins Value (1 byte)				
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x60	TYPE_GET_PINSVAL	

Pins value (10 bytes)					
Frame	Name	Description		C code name	Comments
Byte 1	Type	0x61		TYPE_PINSVAL	
Byte 2	RSSI MSB	UINT8	UINT16	RSSI	
Byte 3	RSSI LSB	UINT8			
Byte 4	-	UINT8	UINT16	reserved	
Byte 5	-	UINT8			
Byte 6	VMOD MSB	UINT8	UINT16	Vmod	
Byte 7	VMOD LSB	UINT8			
Byte 8	TEMP MSB	UINT8	UINT16	Temp	
Byte 9	TEMP LSB	UINT8			
Byte 10	Mode bit flags	*Rest of bits*		*Reserved*	
		Warning BIT4		status_flags	
		PTT2 BIT3			*not used*
		PTT1 BIT2			
		RX Scnd BIT1			
		RX Prim BIT0			

Set TX Power (2 bytes)				
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x62	TYPE_SET_TXPOWER	
Byte 2	TX Power	INT8	TX_Power	0 < TX_Power < 127

Write Calibration (17 bytes)					
Frame	Name	Description		C code name	Comments
Byte 1	Type	0x65		TYPE_WRITE_CAL	
Byte 2	Number MSB	UINT8	UINT16	Cal_SerialNumber	
Byte 3	Number LSB	UINT8			
Byte 4	RSSI Base MSB	UINT8	UINT16	Cal_RSSI_Base	
Byte 5	RSSI Base LSB	UINT8			
Byte 6	RSSI Delta MSB	UINT8	UINT16	Cal_RSSI_Delta	
Byte 7	RSSI Delta LSB	UINT8			
Byte 8	TX Power	INT8		Cal_TX_Power	0 < TX_Power < 127
Byte 9					NOT USED
Byte 10	TEMP MSB	UINT8	UINT16	Cal_TX_Temp	
Byte 11	TEMP LSB	UINT8			
Byte 12	VMOD MSB	UINT8	UINT16	Cal_TX_Vmod	
Byte 13	VMOD LSB	UINT8			
Byte 14	Sidetone	UINT8		Cal_Sidetone	0 < Cal_Sidetone < 255
Byte 15	RX Volume	UINT8		Cal_RxVolume	0 < Cal_RxVolume < 255
Byte 16	Squelch	UINT8		Cal_Squelch	0 < Cal_Squelch < 255
Byte 17	Mic	UINT8		Cal_Mic	0 < Cal_Mic < 255

Read Calibration (1 byte)				
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x66	TYPE_READ_CAL	

Calibration (17 bytes)					
Frame	Name	Description		C code name	Comments
Byte 1	Type	0x67		TYPE_CALIBRATION	
Byte 2	Number MSB	UINT8	UINT16	Cal_SerialNumber	
Byte 3	Number LSB	UINT8			
Byte 4	RSSI Base MSB	UINT8	UINT16	Cal_RSSI_Base	
Byte 5	RSSI Base LSB	UINT8			
Byte 6	RSSI Delta MSB	UINT8	UINT16	Cal_RSSI_Delta	
Byte 7	RSSI Delta LSB	UINT8			
Byte 8	TX Power	INT8		Cal_TX_Power	0 < TX_Power < 127
Byte 9	-	-		-	NOT USED
Byte 10	TEMP MSB	UINT8	UINT16	Cal_TX_Temp	
Byte 11	TEMP LSB	UINT8			
Byte 12	VMOD MSB	UINT8	UINT16	Cal_TX_Vmod	
Byte 13	VMOD LSB	UINT8			
Byte 14	Sidetone	UINT8		Cal_Sidetone	0 < Cal_Sidetone < 255
Byte 15	RX Volume	UINT8		Cal_RxVolume	0 < Cal_RxVolume < 255
Byte 16	Squelch	UINT8		Cal_Squelch	0 < Cal_Squelch < 255
Byte 17	Mic	UINT8		Cal_Mic	0 < Cal_Mic < 255

Set TX Gate Status (2 bytes)				
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x68	TYPE_SET_TXGATE	
Byte 2	ON/OFF	*Rest of bits*	*Reserved*	
		BIT0	status_txgate	

Set TX Audio (2 bytes)				
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x69	TYPE_SET_TXAUDIO	
Byte 2	Volume	UINT8	TX_Audio_vol	0 < TX_Audio_vol < 255

Set Security Unlock (6 bytes)				
Frame	Name	Description	C code name	Comments
Byte 1	Type	0xF0	TYPE_SECURITY_KEY	set to:
Byte 2	Val1	UINT8	securityKey[0]	0x3B
Byte 3	Val2	UINT8	securityKey[1]	0xED
Byte 4	Val3	UINT8	securityKey[2]	0x58
Byte 5	Val4	UINT8	securityKey[3]	0xC2
Byte 6	Val5	UINT8	securityKey[4]	0x7F

Get Unlock Status (2 bytes)				
Frame	Name	Description	C code name	Comments
Byte 1	Type	0x7F	TYPE_UNLOCK	
Byte 2	Unlock	*Rest of bits*	*Reserved*	
		BIT0	0x00 or 0x01	if valid key, returns 1 if wrong key, returns 0