


TNC Testing Form (REV1)	
Leaf on the Tree	AX.25 Protocol
Device Under Test (Testing Tree Number):	2.2.1
Date:	11/1/20
Person(s) Conducting Experiment:	Kobe Keopraseuth
Signature:	
Experiment Purpose:	The purpose of this experiment of this experiment is to verify that our microcontroller can take in a KISS packet and format the AX.25 Packet Correctly.
Experiment Procedure:	Take in a KISS packet from computer and display the fields of the AX.25 packet. We will also show the calculated crc to show that the KISS packet for properly extracted.
Equipment Settings / Software Settings (w Revision):	Use Rizwan's software to send a KISS packet and display the AX.25 packet on serial monitor.
Testing Diagram / Picture:	
Data Points:	

AX.25 Interface

File APRS Services

Destination Callsign: DAVID 1 Calculated HEX String 0x88,0x82,0xAC,0x92,0x88,0x40,0xE2, Calculated SSID Binary 11100010 License Expires 12/15/2020

Source Callsign: KOBE 2 0x96,0x9E,0x84,0x8A,0x40,0x40,0x65, 01100101 Override SSID

Repeater Callsign: KALEB 3 Configure AX25 Use Repeater Address

0x88,0x82,0xAC,0x92,0x88,0x40,0xE2,0x96,0x9E,0x84,0x8A,0x40,0x40,0x65,0x03,0xF0, Convert to ASCII

Transmitted :KOBE-2-> DAVID-1
 Transmitted Hex: 0xC0,0x00,0x88,0x82,0xAC,0x92,0x88,0x40,0xE2,0x96,0x9E,0x84,0x8A,0x40,0x40,0x65,0x03,0xF0,0x7E,0x7E,0x7E,0xC0,
 Comm Port Closed
 Comm Port Opened

Transmitted :KOBE-2-> DAVID-1
 Transmitted Hex: 0xC0,0x00,0x88,0x82,0xAC,0x92,0x88,0x40,0xE2,0x96,0x9E,0x84,0x8A,0x40,0x40,0x65,0x03,0xF0,0x7E,0x7E,0x7E,0xC0,
 Comm Port Closed

Send Clear Use AX25

Serial Port Baud Rate Parity Data Bits Stop Bits

Open Port COM9 115200 None 8 1

Version: 1.1.2.0

Rizwan's software for transmitting KISS packets

```

Start flag      = 1 1 0 0 0 0 0 0
Address Field 1 = 1 0 0 0 1 0 0 0
Address Field 2 = 1 0 0 0 0 0 1 0
Address Field 3 = 1 0 1 0 1 1 0 0
Address Field 4 = 1 0 0 1 0 0 1 0
Address Field 5 = 1 0 0 0 1 0 0 0
Address Field 6 = 0 1 0 0 0 0 0 0
Address Field 7 = 1 1 1 0 0 0 1 0
Address Field 8 = 1 0 0 1 0 1 1 0
Address Field 9 = 1 0 0 1 1 1 1 0
Address Field 10 = 1 0 0 0 0 1 0 0
Address Field 11 = 1 0 0 0 1 0 1 0
Address Field 12 = 0 1 0 0 0 0 0 0
Address Field 13 = 0 1 0 0 0 0 0 0
Address Field 14 = 0 1 1 0 0 1 0 1
Control Field   = 0 0 0 0 0 0 1 1
PID Field       = 1 1 1 1 0 0 0 0
Info Field 1    = 0 1 1 1 1 1 1 0
Info Field 2    = 0 1 1 1 1 1 1 0
Info Field 3    = 0 1 1 1 1 1 1 0
Info Field 4    = 0 1 1 1 1 1 1 0
Stop flag       = 1 1 0 0 0 0 0 0
  
```

Bitstream output of received KISS packet

0x88 0x82 0xAC 0x92 0x88 0x40 0xE2 0x96 0x9E 0x84 0x8A 0x40 0x40 0x65 0x03 0xF0 0x7E 0x7E 0x7E

Input type: ☐ ASCII ☒ Hex Output type: ☒ HEX ☐ DEC ☐ OCT ☐ BIN ☐ Show processed data (HEX)

Calc CRC-8

Calc CRC-16

Calc CRC-32

Calc MD5/SHA1/SHA256

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Algorithm	Result	Check	Poly	Init	RefIn	RefOut	XorOut
CRC-16/X-25	0xFB40	0x906E	0x1021	0xFFFF	true	true	0xFFFF

Online crc calculation for the KISS packet

Convert CRC to FCS (hex) = fb40

Microcontroller's crc calculation for KISS packet

```
Printing AX25_PACKET being sent to radio
AX25 FLAG = 0 1 1 1 1 1 1 0
Address Field 1 = 1 0 1 0 0 1 1 0
Address Field 2 = 0 0 0 0 0 0 1 0
Address Field 3 = 0 0 0 0 0 0 1 0
Address Field 4 = 0 1 0 1 0 0 0 1
Address Field 5 = 0 0 1 0 0 0 0 1
Address Field 6 = 0 1 1 1 1 0 0 1
Address Field 7 = 0 1 1 0 1 0 0 1
Address Field 8 = 0 1 0 0 0 1 1 1
Address Field 9 = 0 0 0 0 0 0 1 0
Address Field 10 = 0 0 0 1 0 0 0 1
Address Field 11 = 0 1 0 0 1 0 0 1
Address Field 12 = 0 0 1 1 0 1 0 1
Address Field 13 = 0 1 0 0 0 0 0 1
Address Field 14 = 0 0 0 1 0 0 0 1
Address Field extra =
Control Field = 1 1 0 0 0 0 0 0
PID Field = 0 0 0 0 1 1 1 1
Info Field = 0 1 1 1 1 1 0 1 0 0 1 1 1 1 1 0 1 0 0 1 1 1 1 1 0 1 0
FCS Field = 1 1 1 1 1 0 0 1 1 0 1 0 0 0 0 0
AX25 FLAG = 0 1 1 1 1 1 1 0
```

AX.25's bit sequence when sent to radio

Pass / Fail:

Pass

Interpreted Notes:

Our microcontroller can properly extract a KISS packet and format it into AX.25, along with correctly calculating the crc for the FCS field. It is also able to place the bits to be sent to over radio in the correct order.

Recommendations for Modifications:

None