WARNING - EXPERIMENTERS ONLY!

Host mode on TNC-2 and derivative TNCs at this time remains experimental. Obvious features received a quick "going over" and rather cursory debug, but discovery of the remaining inevitable bugs and critical programming oversights awaits the adventurous reader/developer. Please direct discoveries and criticisms:

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INTRODUCTION

Asynchronous Framing Technique (AFT) is a public domain method for encapsulating groups - frames - of error-protected 8-bit data across asynchronous serial links. AFT is modeled upon and attempts to emulate a synchronous HDLC link. AFT was developed by Hayes, Inc.

QAFT differs from AFT only in the error detection scheme. QAFT uses a quicker 2's complement checksum vs. AFT's CRC.

REQUIREMENTS

AFT implementation levels 0 and 1 require an asynchronous link capable of passing all 256 8-bit characters unmolested. AFT Level 1 makes an exception for underlying DC1/DC3 flow control: L1 maps DC1/DC3 to different, harmless characters.

BASIC AFT

Every AFT frame consists of:

One or more leading FLAG characters	::	0x7E	
1-nn characters of DATA		::	0x??
One error-detection character	::	0x??	
One or more ending FLAG characters		::	0x7E

And possibly:

Data link Escape		::	0x7D

Flags

The FLAG terminating once frame can simultaneously open the next subsequent frame.

Abort

QAFT supports an HDLC-like abort even though it has little practical use. TNC-2 never transmits the abort sequence. AFT/QAFT specifies the abort sequence as:

The transmitter may abort a frame by sending $7D $7E (escape-flag). No error-detection character is transmitted. The incomplete escape sequence will cause the frame to be rejected by the receiver.

Transparency

Transparency is accomplished by replacing data and error-detection character characters matching AFT's FLAG and DLE characters with a two character sequence made up of:

DLE	:: 0x7D
DATA/error--detection character xor 0x20	
	:: 0x?? ^ 0x20

The first character (DLE) invokes transparency; the second character is the result of exclusive-ORing the original data with 20H.

Optional transparency: the above substitutions are the only ones specified by AFT/QAFT level 0 ("Basic AFT"). Transparency for XON/XOFF characters is supported in AFT/QAFT level 1 and the TNC-2. See below.

Error-detection

QAFT - TNC-2
The error-detection byte is the two's complement of the sum of the frame's data only. Exclude error detection, flags, and escape bytes from the addition.

"X.25/AFT rev 2" -- NOT in TNC-2
The CCITT $(X^{**}16 + X^{**}12 + X^{**}5 + 1)$ error checking polynomial is used. On transmit, the CRC generator should be set to all 1's.

The CRC is transmitted in reverse bit order; ex: when the asynchronous characters received are hicrc=0x73 lowcrc=0x88, the actual CRC is 0x11CE.

AFT LEVEL 1

AFT Level 1 adds DC1 and DC3 to the two characters (FLAG/ESCAPE) mapped by AFT Level 0's transparency mechanism.