



MAC Transmitter Component

FM3TR Waveform Reference Implementation

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1 Component Name

MAC_XMIT (MAC_Transmit)

2 Component Processing Summary

The MAC XMIT component interfaces with the FileInput_MAC_LLC, the RF channel emulator, and the MAC receiver components for error, control, and hop sequence information.

3 Where used

The MAC XMIT component is used in all extended FM3TR data mode waveforms.

4 Data Input and Output Ports

The MAC XMIT component has no data ports.

5 Control Interfaces

The MAC XMIT inherits the control interfaces from CF::Resource.

Additionally, the component has four control interfaces:

MAC_Feedback_Input	Feedback interface for the MAC Receive component
MAC_ErrCtrl_Output	Packet error control feedback input interface.
MAC_FlowCtrl_Output	Flow control input for adaptive data rate
MAC_HopCtrl_Output	Hop control interface for the RF channel emulator component

6 Component SCA Properties

Aside from the DLL execparams, the MAC XMIT component has no additional SCA properties.

7 Component Attributes/Key Variables

Below is a list of several key variables to the MAC receiver with a brief description of their purpose.

m_packets_received	Counter for number of ACKs and NAKs received.
m_previous_flow_ctrl_state	Flow state set depending upon “water” level at the receiver. This level is indicative of the FM3TR

	receiver's input buffer.
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8 Processing Details

The MAC XMIT component is a special component that interfaces with several component on the trasnmitter side of the waveform to pass control information from the receiver. Three specific pieces of information are observed:

1. *Error control.* The error control interface is slightly different from the signaling from the MAC receiver in that the MAC XMIT component keeps track of the number of packets for which it has received feedback. It therefore calls `SignalNAK()` on the `FileInput_MAC_LLC` component and sends a packet identifier. Notice that there is no `SignalACK()` on the `FileInput_MAC_LLC` component; this is because the MAC XMIT component keeps track of which packets were received erroneously.
2. *Flow control.* A “water” mark is sent to the FM3TR encoder component to indicate if it should pause data flow. A “high water mark” pauses flow, indicating that the FM3TR receiver's buffer is nearly full. Data flow resumes only when an “empty” or “low water mark” signal is received.
3. *Hop control.* The hop control interface is intended to signal the RF channel emulator which hopping frequency and the hopping pattern to use.