

# MTX Node Ring Notes

## Node Variables

Name	Address	Description
RCVFLG	F010	Receiver status: 0 = Not in packet 1 = Start of packet received 2 = Data packet 3 = Data packet, >=5 characters, first byte of ID matches 4 = Data packet, not addressed to node 5 = Data packet >=5 characters, addressed to node 6 = Control or program packet
SYNFLG	F014	Packet syntax flag: 0 = No error 2 = Declared packet length does not match received length 4 = Checksum error 8 = Packet type 5, length not 3 bytes
NDTYP	F031	Node type: 2 = Master node

## Packet Format

### Control Packets

Offset	Length	Content	Description
0	1	0x02	Start of packet
1	1	Packet type	0x31 ("1") = Initiate packet 0x32 ("2") = Master packet 0x35 ("5") = Null packet (next character is EOP) 0x37 ("7") = Ring abort / ring error 0x38 ("8") = Master abort / master error
4	12	Source Name	Name of sending node
16	2	Source ID	ID of sending node (hex encoded)
18	2	Hop count?	Number of nodes in the ring?
*	4	Checksum	Hex encoded 16 bit value = minus sum of the packet contents, including packet type
*	1	0x1A	End of packet (EOP)

### Program & Data Packets

Offset	Length	Content	Description
0	1	0x02	Start of packet

Offset	Length	Content	Description
1	1	Packet type	0x39 (“9”) = Program 0x41 (“A”) = Data
2	2	Packet length	Hex encoded
*	*	Data	Hex encoded binary data
*	4	Checksum	Hex encoded 16 bit value = minus sum of the binary length and binary data
*	1	0x1A	End of packet

## Example Ring Traffic

### Ring Initiation (Two nodes over named pipes)

#### At node “Alpha”

Type in: node name,"alpha"

Transmit 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters

Transmit Ring Packet:

119ALPHA 0101FC5D

Receive 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters

Receive Ring Packet:

119ALPHA 0102FC5C

Transmit 61 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters

Transmit Ring Packet:

219ALPHA 0201FC5B

Receive 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters

Receive Ring Packet:

219ALPHA 0202FC5A

Receive 17687 <Ctrl+Z>, 527 NULL packets, 0 Out of packet characters

Receive Ring Packet:

319BETA 0201FC84

Transmit 19675 <Ctrl+Z>, 528 NULL packets, 0 Out of packet characters

Transmit Ring Packet:

319BETA 0202FC83

#### At node “Beta”

Receive 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters

Receive Ring Packet:

119ALPHA 0101FC5D

Transmit 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters

Transmit Ring Packet:

119ALPHA 0102FC5C

Receive 61 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters

Receive Ring Packet:

219ALPHA 0201FC5B

Transmit 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters

Transmit Ring Packet:

219ALPHA 0202FC5A  
Type in: node name,"beta"  
Transmit 17687 <Ctrl+Z>, 527 NULL packets, 0 Out of packet characters  
Transmit Ring Packet:  
319BETA 0201FC84  
Receive 19675 <Ctrl+Z>, 528 NULL packets, 0 Out of packet characters  
Receive Ring Packet:  
319BETA 0202FC83

## Testing Commands (Two nodes over named pipes)

Type in: node name,"alpha"  
Transmit 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters  
Transmit Ring Packet:  
119ALPHA 0101FC5D  
Receive 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters  
Receive Ring Packet:  
119ALPHA 0102FC5C  
Transmit 139 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters  
Transmit Ring Packet:  
219ALPHA 0201FC5B  
Receive 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters  
Receive Ring Packet:  
219ALPHA 0202FC5A  
Type in: node enter  
Transmit 11741 <Ctrl+Z>, 361 NULL packets, 0 Out of packet characters  
Transmit Ring Packet:  
419ALPHA 0101FC5A  
Receive 19043 <Ctrl+Z>, 361 NULL packets, 0 Out of packet characters  
Receive Ring Packet:  
419ALPHA 0102FC59  
Receive 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters  
Receive Ring Packet:  
3192 0201FD0E  
Transmit 88 <Ctrl+Z>, 1 NULL packets, 0 Out of packet characters  
Transmit Ring Packet:  
3192 0202FD0D  
Receive 13336 <Ctrl+Z>, 325 NULL packets, 0 Out of packet characters  
Receive Ring Packet:  
319BETA 0201FC84  
Transmit 27089 <Ctrl+Z>, 325 NULL packets, 0 Out of packet characters  
Transmit Ring Packet:  
319BETA 0202FC83  
Type in: node message,"beta","hello"  
Transmit 37642 <Ctrl+Z>, 736 NULL packets, 0 Out of packet characters  
Transmit Ring Packet:  
A1F02010180910548454C4C4FFD53  
Receive 32920 <Ctrl+Z>, 737 NULL packets, 0 Out of packet characters  
Receive Ring Packet:  
A1701020100A9011BFF20  
Type in: let m\$="you have mail"

Receive 0 <Ctrl+Z>, 1 NULL packets, 0 Out of packet characters

Receive Ring Packet:  
A1701020100A90126FF15  
Type in: node suspend  
Transmit 41058 <Ctrl+Z>, 778 NULL packets, 0 Out of packet characters  
Transmit Ring Packet:  
019ALPHA 0101FC5E  
Receive 18599 <Ctrl+Z>, 778 NULL packets, 0 Out of packet characters  
Receive Ring Packet:  
019ALPHA 0102FC5D  
Type in: node cont  
Type in: node ext,"beta",255,255  
Transmit 77103 <Ctrl+Z>, 897 NULL packets, 0 Out of packet characters  
Transmit Ring Packet:  
A1B020101808FFFFFF0100FCD3  
Receive 36865 <Ctrl+Z>, 897 NULL packets, 0 Out of packet characters  
Receive Ring Packet:  
A1701020100A90119FF22

## Ring Initiation (Two machines over serial)

### Raspberry PI

=== memu started at Sun Feb 1 11:29:50 2015 ===  
Log packets received on /dev/ttyAMA0  
Log packets transmitted on /dev/ttyAMA0  
Type in: node name,"rpi"  
Transmit 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters  
Transmit Ring Packet:  
119RPI 0101FC98  
Receive 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters  
Receive Ring Packet:  
119RPI 0102FC97  
Transmit 102 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters  
Transmit Ring Packet:  
219RPI 0201FC96  
Receive 87 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters  
Receive Ring Packet:  
219RPI 0202FC95  
Transmit 8931 <Ctrl+Z>, 48 NULL packets, 0 Out of packet characters  
Transmit Ring Packet:  
719RPI 0101FC92

Initially displayed "Ring Initialised". A little later this changed to "Ring Error 01".

### Laptop

=== memu started at Sun Feb 1 11:29:53 2015 ===  
Log packets received on /dev/ttyUSB0  
Log packets transmitted on /dev/ttyUSB0  
Receive 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters

Receive Ring Packet:

119RPI 0101FC98

Transmit 0 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters

Transmit Ring Packet:

119RPI 0102FC97

Receive 102 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters

Receive Ring Packet:

219RPI 0201FC96

Transmit 87 <Ctrl+Z>, 0 NULL packets, 0 Out of packet characters

Transmit Ring Packet:

219RPI 0202FC95

Transmit 9189 <Ctrl+Z>, 47 NULL packets, 0 Out of packet characters

Transmit Ring Packet:

7192 0201FD0A

Initially displayed “Ring in operation”. A little later this changed to “Ring Error 02”.