

The Layer 2 digipeater (digital repeater):

1. Repeats all packets (I, S, and U) containing the digipeater's address in the next-to-digipeat position if
 - the total path does not exceed the digipeater's maximum hop count.
 - the next digipeater (if there is one) in the path is in this digipeater's "ok" list.
 - none of the digipeaters in the path are in this digipeater's "exclude" list or, in lieu of an "exclude" list, all digipeaters in the path must be in the "ok" list."
2. Processing is performed per the specification. Special purpose addresses are not supported.
3. Repeats any UI packets containing any special purpose address in the next-to-digipeat position which is recognized by the digipeater. The packet will be repeated if
 - it was heard directly
 - it was last digipeated by a digipeater in its "ok" list unless the packet has been digipeated by a digipeater in its "exclude" list or, in lieu of an "exclude" list, all digipeaters in the digipeated path must be in the "ok" list."
 - it has not been digipeated the maximum hop count.

The digipeater will replace the portion of the path with the H-bit not set with the digipeater's address with the H-bit set and any path defined by the sysop. The sysop defined path will be trimmed or omitted based on the digipeater's maximum hop count.

The "generic discovery" special purpose address is DISCVR and must be implemented by all compliant digipeaters.

4. Does not repeat duplicate UI packets if the path contains a recognized special purpose address as specified in #2. Duplication is determined by calculating a CRC or checksum on all packets repeated based on #2. The CRC or checksum is based on the origin address, destination address, and I-field data.

5. Does not repeat any packet where the digipeater's address appears before or including the call with the H-bit set in the path.
6. Responds to XID packets with settings for PI 5 (max TX I-Field length) and 6 (max RX I-Field length) using the reverse path the packet was received.

These provide:

1. A method for two layer 2 endpoints to establish “best path” communications within the constraints of the LAN.
2. A method for a LAN to span more than one digipeater although 2 is the recommended maximum due to reliability issues. Repeater identification is implemented and path discovery is supported. The sysop defined path should be the generic layer 2 special purpose address DISCVR in most cases. Only UI packets are supported due to only U packet with PID.
3. A multipath duplicate repeat prevention mechanism. This prevents packets received by multiple digipeaters directly from being improperly repeated multiple times by the same digipeater. Multipath is not an issue with a defined path (#1).
4. A method to prevent link layer loops.
5. This implements MTU discovery for higher layer protocol interfaces.

The definition of packet types from the AX.25 v2.2 specification:

4.2.1.1. Information-Transfer Format

All I frames have bit 0 of the control field set to “0”. N(S) is the sender's send sequence number (the send sequence number of this frame). N(R) is the sender's receive sequence number (the sequence number of the next expected receive frame). These numbers are described in Section 4.2.4.

4.2.1.2. Supervisory Format

Supervisory frames have bit 0 of the control field set to “1”, and bit 1 of the control field set to “0”. S frames provide supervisory link control such as acknowledging or requesting retransmission of I frames, and link-layer

window control. Because S frames do not have an information field, the sender's send variable and the receiver's receive variable are not incremented for S frames.

4.2.1.3. Unnumbered Format

Unnumbered frames have both bits 0 and 1 of the control field set to "1". U frames are responsible for maintaining additional control over the link beyond what is accomplished with S frames. U frames are responsible for establishing and terminating link connections. U frames also allow for the transmission and reception of information outside of the normal flow control. Some U frames may contain both information and PID fields.