



APRS Digipeating

What is a digipeater?

- Short for “digital repeater”
- Receives packet data, stores it in its internal memory, then retransmits the packet
 - Each successive digipeater “uses up” an element of the path
- APRS digipeaters use generic, aliased call signs
 - You don’t need to know the local digipeater network

Why use digipeaters?

- APRS typically involves packet data transmission to and from moving vehicles
 - Mobile signals fluctuate
- Signal levels that you may consider adequate on voice won't be on packet
 - Reliable APRS signal range is 1/2 to 1/3 of reliable voice range
- APRS packets are not acknowledged
 - No resends of bad packets

Digipeating do's and don'ts

- Do use the WIDEn-N paradigm
 - WIDEn-N reduces duplicate packets and network congestion
 - WIDE1-1 takes the place of RELAY
- Don't use an excessive number of hops
 - Every transmission occupies not just the time the original user took to send it, but two, three or more **additional** time slots depending on the number of digipeater “hops”

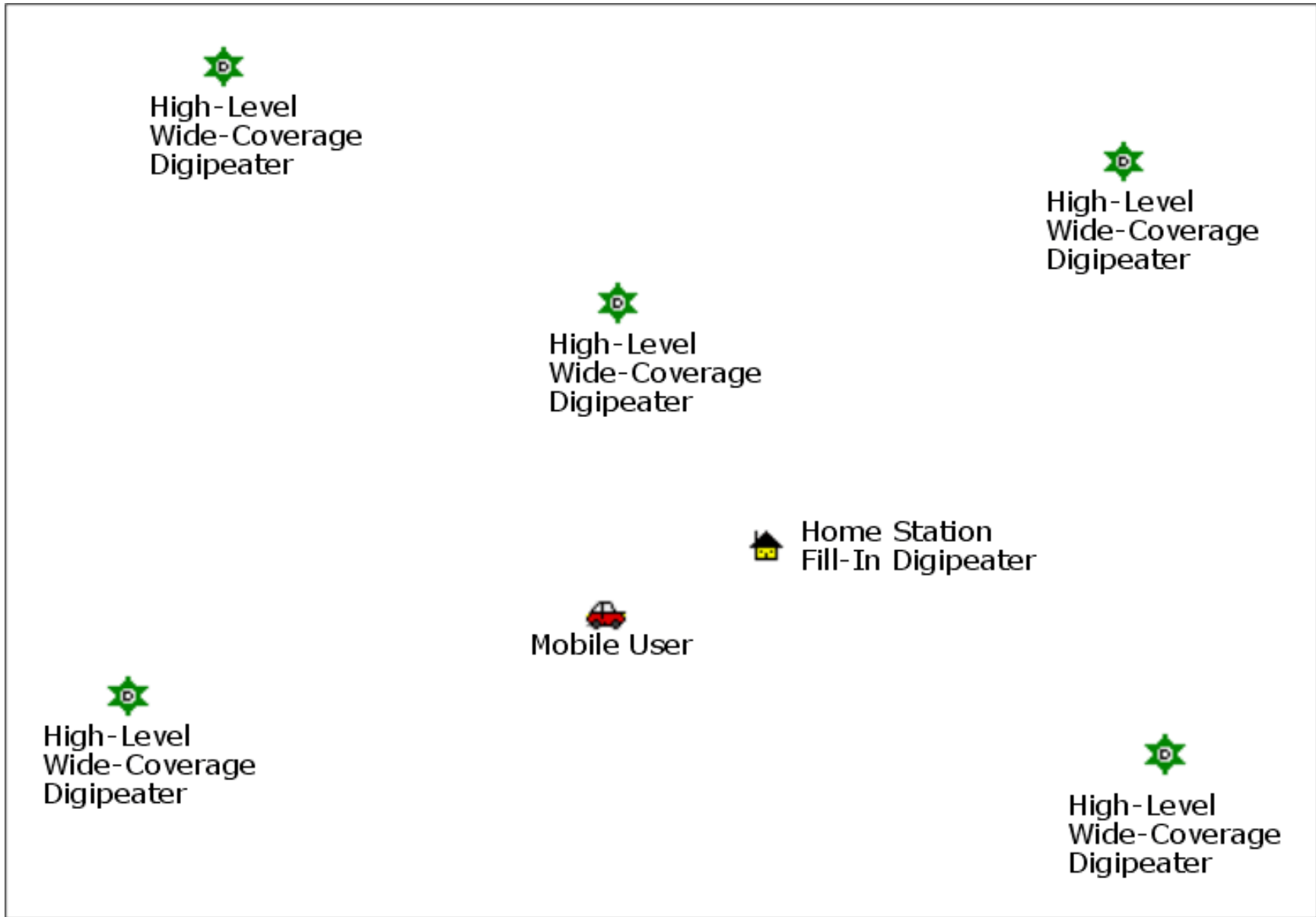
Digipeating example

WIDE1-1, WIDE2-2 (as the user transmitted it)

WIDE1*, WIDE2-2 (first hop by fill-in or high-level digi)

WIDE1*, WIDE2-1 (next hop by high-level digi)

WIDE1*, WIDE2* (final hop by high-level digi)



Courtesy of Stephen Smith WA8LMF



SmartBeaconing™

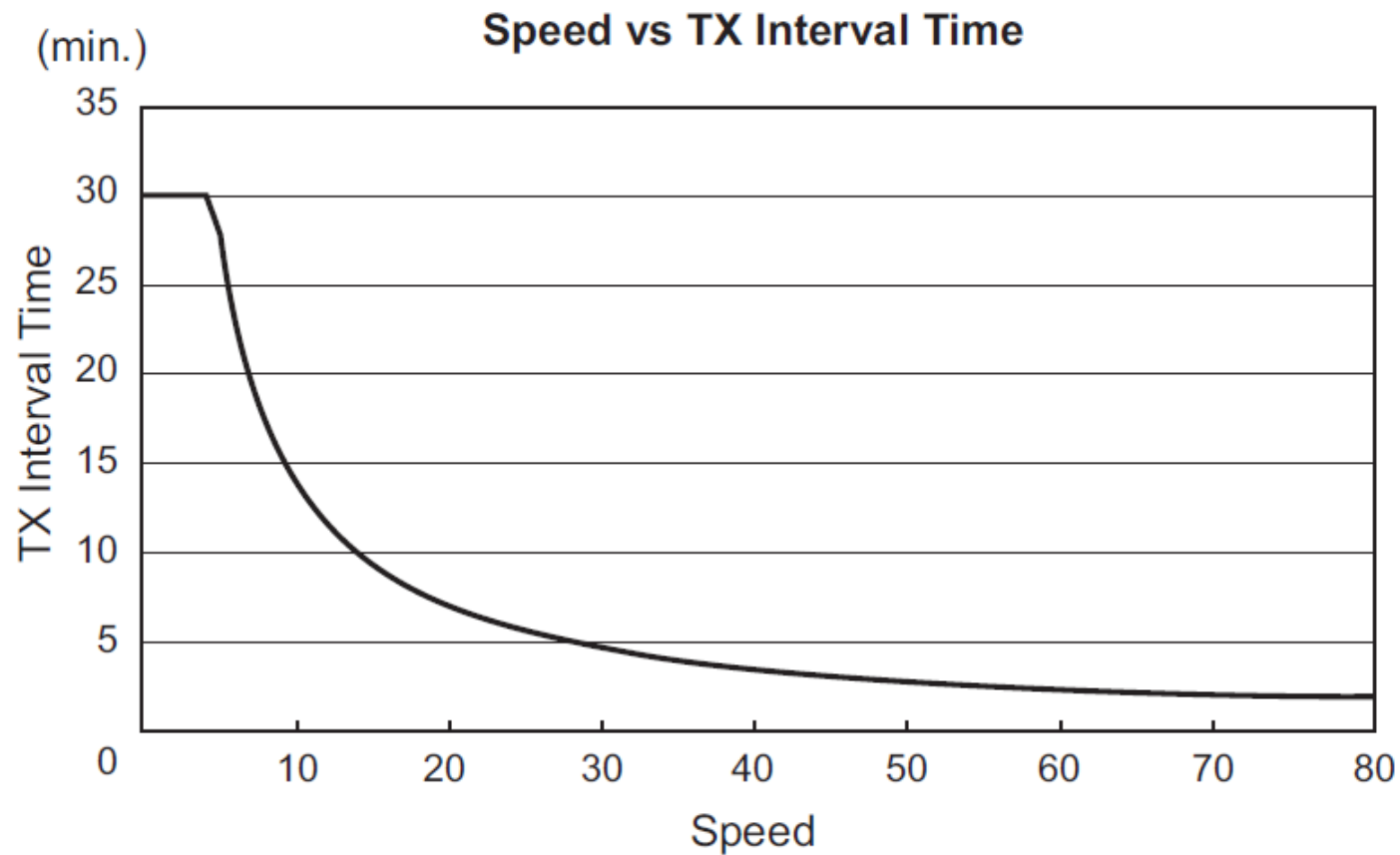
SmartBeaconing™

- Developed by Tony Arnerich KD7TA and Steve Bragg KA9MVA
- Adjusts beacon rate based on speed and change in direction
- Beacon only when there's something useful to transmit
 - Avoids beaconing every 60 seconds while sitting in a parking lot
 - Avoids “positional uncertainty”

How it works

- Modifies the beacon rate based on two factors:
 - Distance traveled since last beacon
 - Heading change since last beacon
- Speed < Low Speed setting, beacon at Slow Rate
- Speed > High Speed setting, beacon at Fast Rate
- Low > Speed < High, adjust beacon rate
- Heading change > Turn Angle, beacon now
- Rate of heading change > Turn Slope, beacon now

Beacon Rate vs. Speed



Recommended settings

- Low Speed: 5 mph
- High Speed: 90 mph
- Slow Rate: 12 min (720 sec)
- Fast Rate: 80 sec
- Turn Angle: 30 deg
- Turn Slope: 30
- Turn Time: 30 sec

- Result: 2 miles btwn beacons btwn 5 and 90mph



APRS Messaging

Messaging

- Short messages only—about 64 characters
- Routed through APRS-IS to destination
- Messages are acknowledged by the recipient
- Messages from APRS to Email
 - Address APRS message to “EMAIL”
- Messages from Email to APRS
 - www.aprsmail.org



Configuration example

Kenwood TM-D710

Questions?