

## Update-Information for DSPTNC/Tracker-Firmware: Version 1.2

### 1. Basics

With version 1.2 the list of features of the DSPTNC/Tracker firmware again expands significantly: extended APRS-digipeating (WIDEn-N), APRS-cross mode digipeating as well as an automatic "frequency list beacon" are the most important new features. Besides these main features, the firmware 1.2 provides several other extensions and enhancements, e.g. the new command %AA for configuring the altitude information in APRS beacons.

### 2. Extensions

#### 2.1 New Commands

##### %AA (APRS Altitude)

Default: 0

Possible parameters: 0...3

Configures the Tracker for transmission of the "altitude"-information in APRS packets.

The parameter is defined as follows:

0:

Altitude information disabled.

1:

If altitude information is available from the GPS receiver, it will be inserted in the UNCOMPRESSED format at the beginning of the comment field (/A=xxxxxx).

2:

If altitude information is available from the GPS receiver, it will be transmitted in the COMPRESSED (base 91) as well as in the UNCOMPRESSED format. Attention: In the compressed format the "course/speed"-information in the respective packets is omitted.

3:

Similar to 1, but even in the compressed mode, the altitude information is only added uncompressed (at the beginning of the comment field). This way the "course/speed"-information is preserved in the compressed position field.

##### %AF (APRS Frequency Beacon)

Default: 0

Possible parameters: 0, and 60...30000

The parameter is defined as follows:

0:

Frequency list beacon is switched off.

60...30000:

The frequency list is transmitted every 60-30000 seconds, as long as at least one entry is available in the list. Immediately after setting a valid %AF parameter value, the beacon list is transmitted for the first time.

Every packet generated by the frequency list beacon starts with ">dF (Hz): " followed by 4 call signs and the corresponding (measured) frequency offset.

Attention: The frequency list beacon is also transmitted in KISS mode. If the beacon is not desired in KISS mode, the %AF command has to be set to "0" before switching to KISS mode. As the frequency list has a maximum size of 32 call signs, a frequency list beacon consists of up to 8 data packets in a row.

**%AG** (APRS Gateway Modem Type)

Default: NONE

Possible parameters: same as for %B command, additionally NONE

Allows cross-mode-digipeating of APRS packets, i.e. packets that have to be digipeated can be transmitted in a mode different from the receiving mode.

If the %AG command is set to a value different from NONE, the DSPTNC retransmits all packets that have to be digipeated due to a valid APRS-Alias (see %AD parameter) using the modulation defined with the %AG command. (Normally, if cross-mode-digipeating is required, this modulation will be different from the modulation defined with the %B command. However, for test purposes, both modulations may also be identical.) After transmitting a digipeated packet, the DSPTNC automatically switches back to the (normal) modulation defined with the %B command. Receiving of packets is always performed in the modulation defined with the %B command, independent of the %AG setting.

If the %AG parameter is set to a value different from NONE and the %AD parameter is set to 3 at the same time, the DSPTNC also digipeats packets without any digipeater in the path, but only if the destination call begins with the letter "A", for example "APRS". In the digipeated packet the digipeater WIDE3-3 then appears in the path. This feature can be used for routing APRS packets from short wave (where they are often transmitted without digipeater in the path to keep them as short as possible) to VHF. These packets will appear there with WIDE3-3 in the path and thus have a good chance to reach an I-Gate to be forwarded into the Internet.

After switching to the new modulation, the transmission of the packet is delayed by at least 0.5 seconds. In this time, the DSPTNC checks if there is any valid signal in the respective modulation on the channel (DCD) and, if necessary, further delays the own transmission.

Limitation of the DCD-function:

In case of split operation (different RX- and TX-frequencies), the audio signal for the DCD comes from the "wrong" source, same if a separate receiver and transmitter is used. Remark: In case of a separate RX and TX it would basically be possible to switch the RX-source with the relay output of the DSPTNC. However, this function has not yet been implemented.

## 2.2 Miscellaneous Extensions/Enhancements

### %AD

In case of %AD = 2 or %AD = 3, alias calls WIDEn-N are also accepted and correctly processed now, with automatic counting down of the N-parameter. The own call sign will not be substituted in the path.

In case of %AD = 3, the alias call sign GATE is now additionally accepted. The call signs will not be substituted.

### %AH

The %AH command now also accepts the parameter "2", which basically has the same meaning as "1" but alternating tracker operation is then also allowed, if %B is set to values higher than (R)600.

### %AN

The %AN command now also accepts the parameter "4". %AN4 combines the functions of %AN1 and %AN3.

## Common

- In the 300 baud FSK mode, the DCD-LED only lights up green in case of frequency deviations of less than +/-40 Hz. Hence the DCD-LED can now be used for manual frequency adjustment of the receiver.
- The DCD-threshold at 9k6/19k2 baud has been adjusted in order to inactivate the DCD faster after a signal disappears.
- The QPSK-demodulator for RPR has been improved, resulting in a gain of about 1 dB. The switching thresholds between BPSK (speedlevel 1) and QPSK (speedlevel 2) have also been optimized.
- The new firmware has been created with full C/Assembler-optimizing, resulting in a significantly shorter code.

## 3. Bug Fixes

- The course-information in the uncompressed APRS-format has been improved. If data with decimal points was supplied from the GPS receiver, a course-format incompatible with the APRS-standard could have resulted before.
- A bug in the X-parameter has been fixed. If it was set to 0, in some cases the PTT-LED was no more switched off, after a packet had been "transmitted".
- Bug in timestamp field of APRS packets fixed. The timestamp was always sent in the HHMMSS format but as format indicator the character "z" was used. However, the cor-

rect format indicator for HHMMSS is “h”. The new firmware now always sends time-stamps in the consistent format HHMMSSh.