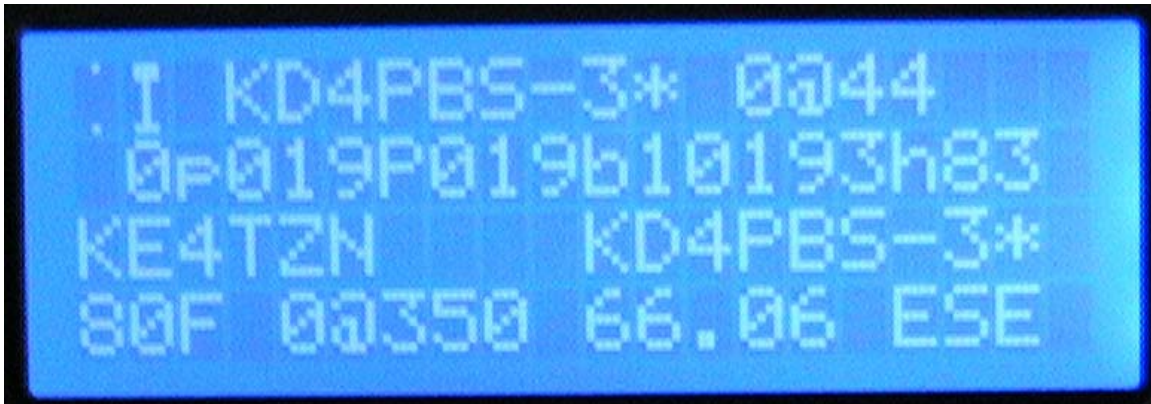# HamHUD II

Firmware Version 2.8.000 Upgrade Guide, Release Notes

And "Quick Start" Mini-Manual

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TABLE OF CONTENTS

1. How To Upgrade V2.7.xxx to V2.8.000

NOTE! THIS VERSION IS KISS-ONLY! Don't load it unless you have a KISS-capable TNC! Examples include the TNC-X, TinyTrak4, OpenTracker, and KPC3+.

NOTE! THIS VERSION WILL WIPE OUT YOUR OLD HAMHUD II SETTINGS! It uses the FRAM memory in a different way.

1. Unzip the HH2 28000.zip file.
2. Start HamHUD Loader (HH2Loader_Rel2_1.exe).
3. Press a key to clear the help file, if necessary.
4. In File menu, click "Select Hex File" and select HH252_UPGRADE.hex.
5. Click "Loader" tab.
6. In "Region To Load" menu, click (UNCHECK) "FRAM".
7. Connect the HamHUD II to the serial port of computer, with a null-modem cable.
8. Power up HamHUD II, holding down the Whiz Wheel button. LCD should say "Load" on line 1.
9. Click "Load" button on HamHUD Loader. Wait for message to reboot.
10. Power down HamHUD II.
11. Disconnect HamHUD II from PC. Connect to TNC if you like.
12. Power up HamHUD II.
13. Wait for FRAM defaults to load. Watch until the "N0CALL" callsign is displayed on line 4.
14. At this point, if you have a TNC plugged in with live data, HamHUD should be displaying it.
15. Use menu to set callsign, icon, SB parameters. That should be all you need to change.

NOTE THAT YOU CANNOT USE THE LOADER PROGRAM TO CUSTOMIZE THIS VERSION!

That capability will return soon!

2. Quick-Start

i. **KISS ONLY** – Sorry, there just wasn't time to debug the TAPR (Kantronics) mode, so this release is KISS only. It will work on MOST KISS TNCs (tested: TNC-X, TT4, KPC3+ and OpenTracker). If you have a Kantronics TNC, just put it in KISS mode.

ii. **DISCONNECT RTS FROM THE TNC!** RTS (pin 4 of the DB-15) is now data OUTPUT to the GPS (as noted below, "GPS WAYPOINTS"). You must disconnect it from your TNC. Older TNCs (such as the KPC-3) will not send data to the HamHUD if GPS DATA (RTS) is connected to the TNC.

iii. **WIPE OUT!** Version 2.8 uses the FRAM in a different way, so beware: IT WILL WIPE OUT ALL YOUR SETTINGS on the first power-up. But don't worry, because…

iv. **DEFAULTS in FRAM!** FRAM will be initialized to default settings, including paths, messages, queries, icons, etc.. (That's the "Defaults in FRAM!" message.)

   FOR NOW, YOU CAN'T USE THE FRAM OPTION IN THE WINDOWS LOADER PROGRAM.

   That will soon be fixed. But, the settings you really need to change can be done with just the WhizWheel.

v. **FRAM SIZE** - V2.8 auto-detects your FRAM size (8K or 32K), and handles things accordingly. You will see your FRAM size displayed on Line 4 of the LCD on startup. (You will really want a 32K FRAM, and you can get an upgrade at www.hamhud.net/webstore.html)

vi. **GRAPHICAL DIGIMETER** - At power-up, you should notice the triple-blinking dual arrows where numerical DigiMeter used to be. These point to the scrolling direction of the new DigiMeter, a continuously-scrolling stripchart. Actually, two of them. The left

one charts how well you've been digipeated on the last 8 transmits. The right one indicates the paths that the last 8 packets from other stations have taken to get to you. In each "line" of the DigiMeters, a blank means not digipeated or a direct path, a single pixel set means a path of 1 digipeat, three pixels means up to 3 digipeats, and a 5-pixel-wide bar means more than 3 digipeats. Your APRS network at a glance. And, it's saved when you power down, so you can remember what the network was like before you QRT'd.

vii. **MENUS** - the menus have changed a lot. You might want to scroll through and familiarize yourself with the new ones. We'll go through the important ones, below.

viii. **CALLSIGN** - You need to change the default N0CALL to your callsign. It's in **Menu2**, under **CallSgn**.

ix. **UNPROTO** - path for transmit is also under **Menu2**, under **TXPath**. It defaults to WIDE2-2, an acceptable default for mobiles under the New-N paradigm in APRS. There's only one path now, not several like in previous versions. A small limitation.

x. **ICON** selection is under **Menu2**, under **MyIcon**. You can use the standard list, or edit it to your liking.

xi. **DAY/NIGHT** - The Bright menu item (second one in main menu) now has three separate settings: NiteBrt, DayBrt, and StopBrt. If you select NiteBrt or DayBrt, the LCD will "stick" in that brightness level, allowing you to quickly change from day to night mode. StopBrt is the brightness level for when the GPS indicates 0mph/kph for 10 mins (used to default to 0).

xii. **GPS WAYPOINTS** - V2.8 defaults to sending waypoints to a mapping GPS (like Garmin eTrex or GPSmap). You'll have to wire your GPS's receive data pin to the former RTS pin. This is really fun, and adds a whole new dimension to HamHUD II: mapping. To set the number of characters in your GPS's waypoint, use **Menu2** -> **GPSWlen**.

xiii. **MONSTER RECEIVE BUFFER** - You will notice that the green RX light blinks quickly while the HamHUD is in the Menu or is

otherwise busy. That's the new packet buffering code at work. No worries about missing data while in the menus.   No need for the RTS handshaking or XON/XOFF handshaking any more (latter is still supported for TAPR mode only). No more lost packets, at least until the 24K buffer fills up, which doesn't hardly ever happen.

xiv. **WEATHER & OBJECTS** - You should notice that weather data and APRS objects display correctly now, and with packet & object comments enabled by setting Line2 to ExtData, you can see what you used to be missing.

 xv. **SEE MORE DATA** - Line 2 of the display now defaults to showing extended packet data, like comments, altitude, and basically anything else HamHUD II doesn't understand or parse directly. If you want to see other Line2 data (like received path, GPS data, etc.), you can change it under the **Line2** menu, just like before.

xvi. **LOTS OF FIXES!** See the Release Notes section for details.

3. TNCs Tested to Work with 2.8.000

- TNC-X (www.tnc-x.com)
- OpenTracker+
- OpenTracker+ SMT
- TinyTrak4
- Kantronics KPC-3+
- Kantronics KPC-3 (non-plus)

4. Release Notes (Changes since v2.7.004j)

a. This version is KISS ONLY. The TAPR mode exists in this version of the firmware, but it is too buggy to use, so we removed the **Menu2**->**TNCMode** menu item. Because the KISS mode in the Kenwood radios is so profoundly broken, we plan to fix the TAPR mode of the HamHUD firmware very soon.

b. Twenty (20) MHz crystals are now obsolete. From now on, only firmware versions that support the 10 MHz crystal (40 MHz internal) will be released. To get a replacement crystal, visit www.hamhud.net/webstore.html.

c. DO NOT USE the FRAM option of the Windows Loader program at this time! It is now incompatible with the FRAM format, and is not needed anyway as the FRAM is pre-initialized by the firmware. Shortly, a new Windows Loader program will be released to allow customization of settings using a PC.

d. HamHUD no longer reads the callsign (or anything) from the TNC on power-up. This was the source of endless trouble, and hasn't been needed since we had the FRAM. Therefore, the "TNC Bypass" function of the "Beacon Now" button no longer applies.

e. Menu system rearranged quite a bit, to try and put commonly-used functions in the first-level menu (like Brite and Line2).

f. Changed 2-level menu functionality. Menu used to return and "hang" in the top-level menu after selecting a level-2 (Menu2) menu item. Menu now exits after selecting any menu item, whether in Menu2 or not.

g. Menus are still stored in FRAM, but they are re-written from FLASH memory whenever a new firmware version is loaded. That way, the PC loader program is not required to initialize the menus in a new HamHUD, and menus automatically update whenever the firmware changes.

h. Add Automatic initialization of FRAM, avoiding the requirement to hook a new HamHUD to a PC for loading.

i. Callsign is now in a separate menu, Menu2->Callsign.

j. UNPROTO paths (Menu2->TXPath) no longer include the destination address or the "V" (VIA) keyword. The destination address is hard-coded to APHH2, the official dest address for HamHUD II.

k. Dual-brightness mode.   The Bright menu item (second one in main menu) now has three separate settings: NiteBrt, DayBrt, and StopBrt. If you select NiteBrt or DayBrt, the LCD will "stick" in that brightness level, allowing you to quickly change from day to night mode. StopBrt is the brightness level for when the GPS indicates 0mph/kph for 10 mins (used to default to 0). The backlight will return to the last selected mode (DayBrt or NiteBrt) when the vehicle begins moving again.

l. Brightness for incoming messages is no longer blinding at night. It used to perform a logical NOT on the brightness level. Now, when a message comes, the brightness is increased by 35 "clicks", up to a maximum of 255, and returns to normal when the message is done scrolling.

m. When Line2 is set to GPS, it does not show the first seven characters of the GPS sentence (for example, $GPGGA,). This conserves precious screen space, and allows the time and latitude to be seen on a $GPRMC sentence, for example.

n. An Object menu item was created to send APRS objects, but the functionality is not fully implemented yet. At this time, it does nothing.

o. Not really a change, but a note: the Query menu can be used to send all kinds of APRS packets, because the text edited in the Query menu is sent directly to the TNC (wrapped in an APRS packet header, of course). So, arbitrary APRS packets up to 20 characters long may be edited manually and sent using the Query menu.

p. Fixed temperature and wind speed bugs in APRS positioned and positionless weather report parsing.

q. HamHUD now responds to any query of the form: ?APRS* or ?HUDS*, where the * can be any characters.   This includes ?APRSP? which the Kenwood responds to as well.   It responds by sending out a posit, just as if you had pushed the BeaconNow button.

r. HamHUD does not respond as of this release to directed queries.

s. Add KISS TNC support. KISS is the default TNC type for now, as explained above, because TAPR support is broken right now.

t. Use of FRAM for TNC receive buffering, removing the need to use the RTS pin.

u. RTS pin is now re-assigned as GPS Waypoint Output.

v. Output of $GPWPL sentences to the RTS pin, at the GPS baud rate, for all received stations and objects within selected range circle (all stations/objects if range circle is zero). All waypoints that you create with the MarkWP menu item are also sent to the GPS as $GPWPL sentences as soon as they are created.

w. The Menu2->GPSWrng menu item allows you to set the range circle for stations/objects to be sent to the GPS as a $GPWPL sentence. The range can be set from 1-255 range units (miles or km, depending on how the SmrtBcon units parameter is set). Setting the range to 0 allows ALL stations/objects to be sent to the GPS. This is the default setting.

x. Numerical DigiMeter replaced with dual graphical strip-chart DigiMeters.

y. Support of Base-91 compressed posits, which was buggy, has been removed. These packets have become less common on findu. Support for them may return in a future version.

z. Dual-color packet indicator LED will blink GREEN quickly when it receives and buffers a packet. You will see this at times when the HamHUD is busy displaying a packet, or is in the menu, etc.

aa. Status messages are now transmitted as TRUE APRS status messages. That is, the text edited in the Status menu has the APRS status indictator character ">" and the current GPS timestamp prepended. If no GPS data is available, the timestamp is set to all zeroes.

bb. A new SmartBeacon parameter (Menu2->SmrtBcn) has been added for proportional paths (de WB4APR). If the item "1=SB+PP 0=SB" is set to 0, SmartBeaconing works just like in previous HamHUD II firmware versions. If it is set to 1, then any packets sent at the FastRate are sent using a direct path (no digipeaters). This reduces QRM, but may not guarantee that others can see every packet. All corner-pegs will use the default TXPath, though, so the rough shape of your journey should be preserved on the receiving station's map.

cc. A new Line2 display option has been added, replacing the old "Idle" selection. The new option, ExtData, scrolls any extra packet data, such as comments, altitude, un-parsed data, etc., on Line2 as a packet is received. Line2 is cleared whenever a new packet is received, so you can be sure that the data displayed in Line2 in this mode really goes with the callsign that is being displayed in Line3.

dd. The bandwidth-wasting $GPRMC format is no longer supported for transmitting position packets (posits). This decision was made to prepare the

way to support MIC-E posits in the future. Therefore, the posit selection SmartBeacon parameter (Menu2->SmrtBcn) is no longer present.

ee. The TNCCmd menu item still exists, but has no meaning presently for KISS TNCs. This menu item should be considered deprecated, as it may disappear in a future version along with TAPR TNC support.

ff. Just in case you're curious, we still have room to grow the firmware:

Program statistics:

Total ROM used   27985 bytes (85.4%)
Total RAM used   1369 bytes (89.1%)