

APRS DATA COMMUNICATION (APRS BEACON)

- ◆ This function uses the APRS format for data communications including your station position, messages, etc..
- ◆ When data is received from another station, the direction of the received station (from your station's perspective), their distance, and their grid square locator is displayed. Any comments sent by the other station are also displayed.
- ◆ Meteorological data obtained from a connected Weather Station can be transmitted.
- ◆ APRS (Automatic Packet Reporting System) is a worldwide system introduced by Bob Bruninga, WB4APR .

< APRS® is a software program and registered trademark of Bob Bruninga, WB4APR.>
Official APRS Website: <http://www.aprs.org>

NAVITRA DATA COMMUNICATION (NAVITRA BEACON)

- ◆ The Navitra system was introduced by Kenwood in the 1990's, for use within Japan.

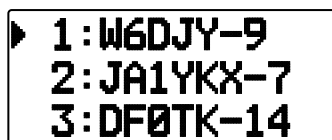
CALLSIGN AND BEACON TYPE SETTINGS

- ◆ When an APRS/NAVITRA beacon is created, set the s and beacon type (APRS/NAVITRA) (Menu 301).



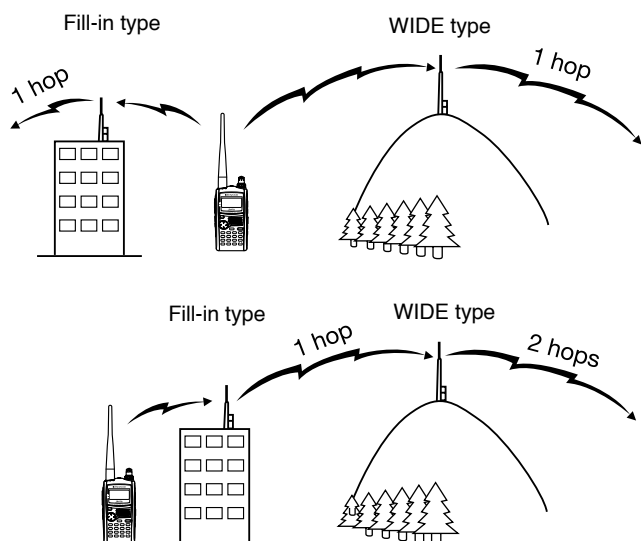
- ◆ SSID (Secondary Station IDentifiers) can be added to the end of your callsign (for example, W6DJY will become W6DJY- 14). SSIDs can range from "None, - 1" to "- 15", so that each callsign can have up to 16 settings.

Refer to the website for SSID: <http://aprs.org/aprs11/SSIDs.txt> (as of November 2011)



DIGIPEAT

- ◆ The term digipeat means that the packet data is relayed. When a digipeater (relay station) receives a packet, it saves it to memory. When the reception ends, the data is re-transmitted. Using digipeat, it is possible to send beacons long distances.
- ◆ In order to perform a digipeat, you must set up a packet path (Menu 3H0). For the packet path, you can specify a direct callsign or you can use "WIDE1-1" or "WIDE1-1, WIDE2-1", specifying a common alias and hops number. Set the transceiver's packet path according to the digipeater settings.
- ◆ Digipeat is very useful in reaching other stations when you have a weak signal. However, you need to set up the total hops numbers and beacon transmissions moderately to prevent channel congestion.



WIDE type:

This digipeater can send the packet over a wide area.

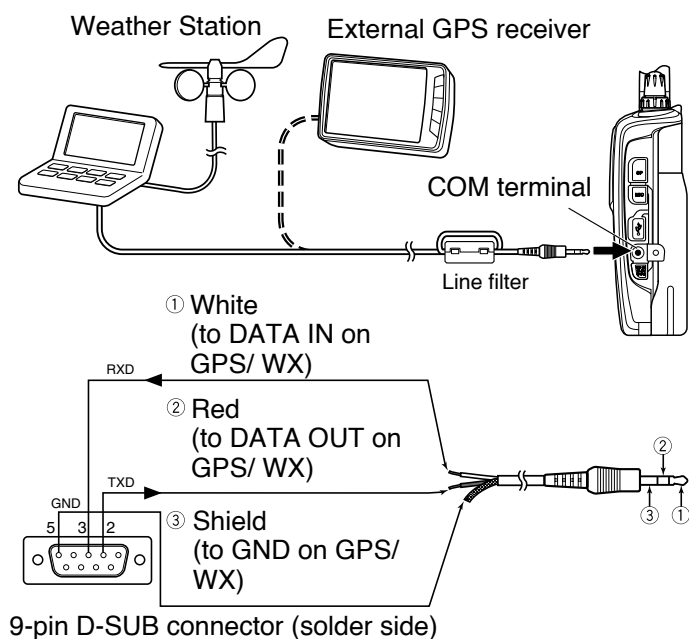
Fill-in type:

Regional digipeaters are also called "RELAY type" relays. These digipeaters are used for mobile stations when a signal cannot reach a WIDE-type digipeater.

Note: While using APRS, in order to prevent Packet miss-decoding, access Menu No. 110 and set the Battery Saver to "Off" or "0.03".

CONNECTING TO AN EXTERNAL GPS UNIT OR WEATHER STATION

The COM terminal on this transceiver accepts a 2.5 mm (1/10") 3-conductor plug. If necessary, use the cable (service part: E30-3400-XX) to modify the cable end of external GPS receiver or Weather Station.



- Attach the line filter to the cable.
- Use a GPS receiver which conforms to the NMEA-0183 format and is compatible with RS-232C signal polarity output at the below mentioned levels.
[Low level: less than +0.5 V / High level: more than +3 V]
You cannot use GPS receivers with USB-type connections.
- Depending on the specifications of the equipment you are connecting, it may be necessary to connect pins 4 and 6, and pins 7 and 8, on the 9-pin D-SUB connector.

ADJUSTING THE INTERNAL CLOCK

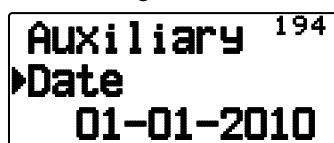
When the internal GPS function is turned ON, the year, month, day, and time are automatically set from the GPS satellite information. If the GPS information cannot be received, you can manually enter the date and time.

Note: The battery for the clock backup is built into the unit. When the battery pack is connected, the backup battery begins to charge. It takes approximately 8 hours to become fully charged.

Setting Date

- 1 Access Menu 194.

- The first 2 digits blink.



- 2 Press [▲]/[▼] or rotate the **Tuning** control to enter the current month (TH-D72A) or day (TH-D72E), then press [▶OK].
 - The next 2 digits blink.

- 3 Press [▲]/[▼] or rotate the **Tuning** control to enter the current day (TH-D72A) or month (TH-D72E), then press [▶OK].
 - The last 2 digits blink.
- 4 Press [▲]/[▼] or rotate the **Tuning** control to enter the current year, then press [▶OK].
- 5 Press [ESC ◀] to exit Menu mode.

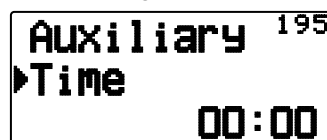
Note:

- ◆ When used at room temperature (25°C), the error of the internal clock in a month is within one minute.
- ◆ The internal clock is effective until December 31, 2099.

Setting Time

- 1 Access Menu 195.

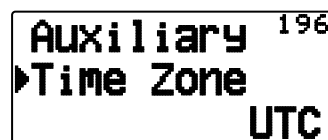
- The first 2 digits blink.



- 2 Press [▲]/[▼] or rotate the **Tuning** control to enter the current hour, then press [▶OK].
 - To set 1 o'clock PM for example, select 13.
 - The next 2 digits blink.
- 3 Press [▲]/[▼] or rotate the **Tuning** control to enter the current minute, then press [▶OK].
- 4 Press [ESC ◀] to exit Menu mode.

Setting UTC Offset

- 1 Access Menu 196.



- 2 Press [▲]/[▼] or rotate the **Tuning** control to select the appropriate UTC offset, then press [▶OK].
 - The selectable range is from +14:00 to -14:00 in steps of 15 minutes.
- 3 Press [ESC ◀] to exit Menu mode.

RECEIVING APRS DATA

Each time a new APRS packet is received, the frequency display is interrupted to show information as below:

▶W6DJY-9
Enroute to
hamfest.

- The received APRS packet may include information on an object such as a hurricane or tornado. In this case (ex. object), the name of the object appears instead of a callsign.
- To restore the frequency display, press **any key** or just wait for approximately 10 seconds. (You can change the time through Menu No. 3U1(Interrupt Time).)

Note:

- ◆ When you receive an APRS packet including an "Emergency" comment, a different format of display from the above will appear and a different beep will sound.
- ◆ When you receive an APRS position packet that you transmitted, the frequency display is interrupted and "My Position" will appear on the display. This could happen when one or more digipeaters are used. (When setting Menu No. 3U0 (Display Area) to "Entire Disp", or "One Line", the call sign of the digipeater station will not display.)

My Position
Via
W6DJY-1

- ◆ If you receive a message that you transmitted, "My Message" will appear.
- You can change the interrupt screen display setting through Menu No. 3U0 (Display Area). When set to "One Line", the frequency display is not interrupted. An indicator such as "dP" appears depending on the types of data. Refer to the table.

dP W6DJY-9
▶144.390
438.350

Indicator	Meaning
dP	Duplicate position comment
nP	New position data
oP	Other station position data (Navitra beacon)
>P	Beyond position limit
>F	Beyond filter type
aM	ACK message
dM	Duplicate message data
nM	New message data
oM	To other stations message data
rM	Rejected Message
dS	Duplicate status text
nS	New status
Q?	Query
??	Packet that cannot be decoded
dD	Duplicated DX cluster data
nD	New DX cluster data

Note:

- ◆ The APRS programs for PCs have entry fields for a position comment and status text. The data entered to these two fields are transmitted as separate packets. This transceiver, however, includes both of a position comment and status text in one packet to transmit.

- ◆ This transceiver beeps each time it receives any type of APRS packet. You may access Menu 3TO (Sound - RX Beep) to change this setting. The default is "All".

ACCESSING RECEIVED APRS DATA

This transceiver is capable of receiving and storing APRS data received from up to 100 stations in memory. You can easily recall the information of the desired station.

1 Press [LIST].

- The list of stations appears.
- The numbers beside the callsigns indicate the order in which data is received. The data received last is assigned 1.

▶ 1:W6DJY-9
2:JA1YKX-7
3:DF0TK-14

2 Press [LIST] (1s) to change the List type to [Callsign + model name], [Callsign + Time + QSY].

-STATION LIST-
▶ 1:W6DJY-9 TMD710
2:JA1YKX-7 TH-D72
3:DF0TK-14 TMD710
4:W5DJY FIXED
5:9U1KW-13 WX

-STATION LIST-
▶ 1:W6DJY-9 15:08F
2:JA1YKX-7 15:01F
3:DF0TK-14 14:55
4:W5DJY 14:52
5:9U1KW-13 14:49

- Press [▼]: To move the cursor "▶" to big list number (Old receiving station).
- Press [▲]: To move the cursor "▶" to small list number (New receiving station).
- Press [ESC ◀]: Return to the frequency display.
- Press [A/B]: Deletes the selected station.
 - "Clear?" appears then press [▶OK] to clear.
- Press [A/B] (1s): Deletes all stations.
 - "Clear All?" appears. Press [▶OK], "Sure?" appears then press [▶OK] to clear all.
- Press [MENU]: To enter the station list menu.

2 Press [▲]/[▼] to select the desired station using the cursor (⬆/⬇).

3 Press [▶OK].

- The information of the selected station appears.

▶ 2:JA1YKX-7
TH-D72
In Service

- Press [▶OK]: Displays the next page.
- Press [ESC ◀]: Displays the previous page.
- Press [A/B]: Deletes the current station.
- Press [MENU]: To enter the station list menu.

Note:

- ◆ When data from the 101st station is received, the oldest data in memory is replaced by that data.
- ◆ Each time a new APRS packet is received from the same station, the old data from that station (in memory) is replaced by new data.

DISPLAY EXAMPLE

Page 1 :



- ① Callsign
- ② Situation
- ③ Station icon
- ④ Position comment ¹

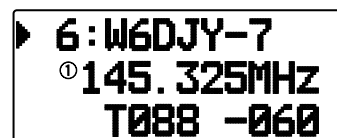
¹ For packets received from Mic-encoder stations including TM-D710s, TM-D700s, TH-D72s, and TH-D7s, position comments are displayed in the fourth line.

(Object)



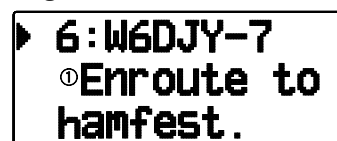
- ① Object

Page 2:



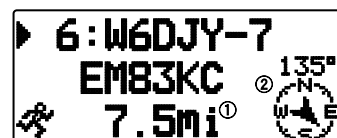
- ① Status text

Page 3:

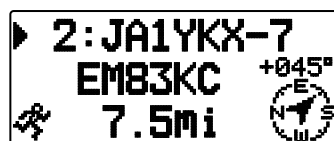


- ① Status text

Page 4:

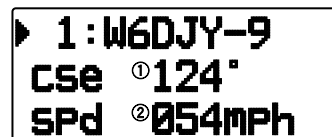


- ① Distance from station (mile or km)
- ② Direction of station
 - When pressing [F] while the target point distance/traveling direction is displayed, the North Up display (displays North as the top) changes to the Heading Up display (displays the current travel direction as the top) or vice-versa. In the Heading Up display, a "+" or "-" is used to help indicate the traveling direction.



Page 5:

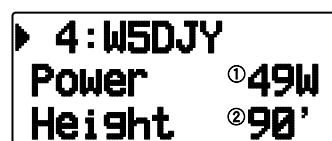
(Mobile station)



- ① Moving direction
 - ② Moving speed (mph: Mile/hour or km/h: km/hour)
- (Weather station)



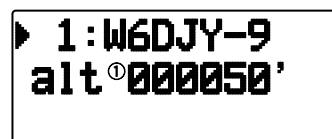
- ① Rainfall (" or mm)
 - ② Air temperature
 - ③ Wind direction
- (Fix station)



- ① Transmit power
- ② Height of antenna (elevation) (' : Feet or m: Meter)

Page 6:

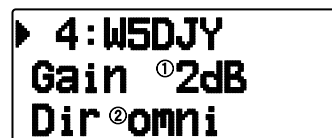
(Mobile station)



- ① Altitude (' :Feet or M: Meter)
- (Weather station)

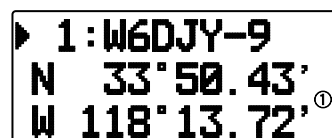


- ① Wind velocity (mph: Mile/hour or km/h: km/hour)
 - ② Atmospheric pressure
 - ③ Humidity
- (Fix station)



- ① Antenna gain
- ② Antenna directivity

Page 7:



- ① Position data

Page 8:

(Packet path)

▶ 1:W6DJY-9
F:W4DJY-1^①
L:W6DJY-2^②

① F: First Repeat (Degipeater) Station's callsign

② L: Last Repeat (Degipeater) Station's callsign

Page 9:

▶ 1:W6DJY-9
^①10/10/2010
^②17:22

① Receive date

② Receive time

This transceiver is capable of displaying the following icons as station IDs.

<APRS>



<NAVITRA>



Some icons may appear with overlay characters as below if the received icon data includes them (APRS only).

Example:



The following icons show the directions of stations relative to your position.

(North Up)



(Heading Up: example)



To change the speed/distance and/or temperature settings of the units, access Menu 3V0 (Units 1 - Speed/ Distance) and/or Menu 3V2 (Units 1 - Temperature).

Note: Some stations transmit APRS packets through TNCs connected to GPS receivers. If you receive packets from those stations, "GOOD" (satellites tracked) or "LAST" (satellites not tracked) will be shown as the situation, with GLL, GGA, or RMC which designates \$GPGLL, \$GPGGA, or \$GPRMC format.

SORT FUNCTION

This function allows you to sort the station list according to the callsign, date time, or distance.

1 Press [LIST] and display the list of stations.

▶ 1:W6DJY-9
2:JA1YKX-7
3:DF0TK-14

2 Press [MENU] and display the station list menu.

1:W6DJY-9
▶Tune
Sort

3 Press [▲]/[▼] or rotate the **Tuning** control to select [Sort], then press [▶OK].

1:W4DJY-3
Tune
▶Sort

- The sort type list appears on the display.

<Sort>
by Distance
▶by Callsign

4 Press [▲]/[▼] or rotate the **Tuning** control to select a sort type, then press [▶OK].

- "Sorting!" appears on the display and sorting begins.

Sorting!

Callsign	All callsigns are compared and arranged in ascending order.
Date/Time	All received dates and times are compared and arranged in descending order, with the last received message listed first.
Distance	The distance between the other station and My station when selecting the sorting method is calculated, then compared and arranged in ascending order, with the closest station listed first.

5 The newly sorted station list appears on the display.

▶ 1:W4DJY-9
2:W5DJY-7
3:W6DJY-7

- After sorting, when new station data is received, it is added to the station list without resorting.

DISPLAY FILTER FUNCTION

This function allows you to display only the specified types of data from the station list.

- 1 Press **[LIST]** and display the list of stations.

▶ 1:W6DJY-9
2:JA1YKX-7
3:DF0TK-14

- 2 Press **[MENU]** and display the station list menu.

1:W6DJY-9
▶Tune
Sort

- 3 Press **[▼]** or rotate the **Tuning** control to select **[Filter]**, then press **[▶OK]**.

1:W6DJY-9
▶Filter

- The filter type list appears on the display.

<Filter>
▶Weather
Mobile

- 4 Press **[▲]/[▼]** or rotate the **Tuning** control to select a filter type, then press **[▶OK]**.

- “Filtering” appears on the display and filtering begins.

Filtering!

All(Off)	The filtering function is cancelled, displaying all stations.
Digipeater	Only Digipeater Stations are displayed.
Weather	Only Weather Stations are displayed.
Mobile	Only Mobile Stations are displayed.
Object	Only Object Stations are displayed.
KENWOOD	Only Kenwood TH-D72, TH-D7, TM-D700, TM-D710, and RC-D710 Stations are displayed.
NAVITRA	Only Navitra Stations starting from \$PNTS are displayed.
QSY (Freq)	Only stations containing frequency (QSY) data are displayed.
1-Way	Only the message incapable MicEncoder format stations and the GPS trackers are displayed.
Others	Stations other than those listed above are displayed.

- 5 The newly filtered station list appears on the display.

▶ 1:9U1KW-13
2:W6DJY-13

- After the display filter function is turned ON, received data is added to the list but will not be displayed if it matches the filter type selected.
- For example, with the station list displayed and the display filter selection set to “Weather”, all stations not relating to weather are no longer displayed. If mobile station data is received at this time, the new data will also not be displayed as long as the weather filter is active.

RECEIVING A MESSAGE

Each time a proper message is received, the frequency display is interrupted to show information as below:

First page:

① ② ③ ④
*D→W6DJY-7
⑤ I will leave
home soon.

Last page:

*D→W6DJY-7
⑥ 05/12 ⑦ 17:22
Line# ⑧ 12345

- ① Status Indicator ② Meaning Indicator
③ RX or TX Indicator ④ Callsign (TX)
⑤ Message ⑥ TX/RX date
⑦ Receive time ⑧ Line number

- The display shows up to 67 characters (24 characters by one page) of the message.
- The following indicators appear depending on the types of received messages:

① Status	
n ¹	“n” indicates the remaining number of times for transmitting the message (or bulletin).
* ¹	A message for which a reception acknowledgment was returned
. ¹	A message (or bulletin) transmitted 5 times (For a message, a reception acknowledgment was not returned.)
② Meaning	
D	Message addressed to you
B	Bulletin message
!	Report by the National Weather Service
③ RX or TX	
←	Received message (or bulletin)
→	A message (or bulletin) for transmitting

¹ These indicators appear for outgoing messages (or bulletins).

- When a duplicate message from the same station is received, the reception interrupt display does not appear and an error tone sounds. When the frequency at that time appears on the display, "dM" (duplicate Message) and the calling station's callsign appears on the display.

```

dM W6DJY-9
▶144.390 0
440.000

```

Note:

- This transceiver allows you to receive a message also when the SSID does not match. However, it will not return a reception acknowledgment.
- The dedicated memory is used for storing both incoming and outgoing messages. Receiving a new message when the memory is full causes the oldest message to be deleted. A message not yet transmitted 5 times may be unexpectedly deleted. If the oldest message has not been accessed using the List function when memory is full, a new message does not replace the oldest message. This transceiver will return a reject command and display "rM".
- This transceiver beeps each time it receives any type of APRS packet. You may access Menu 3N0 (Sound-RX Beep) to change this setting. The default is "All".

ENTERING A MESSAGE

To transmit a message, first enter the callsign of the target station. To transmit a bulletin, enter "BLN#" instead; where # must be 0 to 9 or A to Z. When the length of your bulletin exceeds 64 digits, you may transmit more than one packet to send the entire bulletin. Use # to indicate the sequence of the bulletin portions. For example, enter "BLN0" (or "BLNA") to send the first packet, then "BLN1" (or "BLNB") to send the second packet.

1 Press [MSG].

- The message list appears on the display.

```

▶1+W6DJY-9
2BW6DJY-7
3+W4DJY-9

```

2 Press [MENU].

- The message list menu appears on the display.

```

1+W6DJY-9
▶Reply
Edit

```

3 Press [▲]/[▼] or rotate the **Tuning** control to select [New], [Edit] or [Reply].

```

1+W6DJY-9
Edit
▶New

```

- The display for entering a callsign appears; the first digit blinks. (When you press [Edit] or [Reply], not necessarily)

```

MSG Input
▶To: ■■■■■■■■■■

```

- When selecting [Edit], the original message is quoted and you can then edit it.

4 Press [▲]/[▼] or rotate the **Tuning** control to select the first digit.

- You can enter 0 to 9, A to Z, and –.

5 Press [▶OK].

- The cursor moves to the next digit.
- Press [ESC ◀]: Causes the cursor to move backward.
- Press [A/B]: Deletes the digit at which the cursor is blinking.

6 Press [▲]/[▼] or rotate the **Tuning** control then press [▶OK] to complete the setting.

- The display for entering a message appears; the first digit blinks.

```

MSG Input
▶To: W6DJY-7
▶■■■■■■■■■■

```

Press [ESC ◀]: Causes the cursor to move backward.

Press [A/B]: Deletes the digit at which the cursor is blinking.

- To copy a message, enter message compilation mode, press [F] to enter function mode, then press [1] (Paste 1), [2] (Paste 2), [3] (Paste 3), [4] (Paste 4), [5] (Paste 5), [6] (Paste 6), [7] (Paste 7), or [8] (Paste 8) key for 1 second to copy the message that has been set up for each key.

```

Phrase Paste
▶1: Good morni
2: Good after

```

7 Press [▲]/[▼] or rotate the **Tuning** control to select the first digit.

- You can enter alphanumeric characters plus special ASCII characters.

8 Press [▶OK].


- The cursor moves to the next digit.

9 Repeat steps 6 and 8 to enter up to 67 digits.

10 Press [▶OK] to complete the setting.

TRANSMITTING A MESSAGE

- 1 Press **[MSG]**.
 - The message list appears on the display.
- 2 Press **[MENU]**.
 - The message list menu appears on the display.
- 3 Press **[▲]/[▼]** or rotate the **Tuning** control to select **[Send]**.



1+W6DJY-9
►Send
Reply

- 4 Press **[►OK]** to send the message.

You can select the follows item other then [Send], [Reply], [Edit], [New] in message list menu.

Re-TX: Sending the message again.

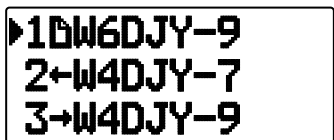
Position: Search position information from a position list.

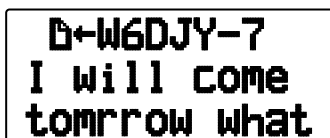
POS Request: The position data of the transmitting station is displayed (if the station data is available).

Unread: Change the existing reading message to unread message.

ACCESSING RECEIVED APRS MESSAGES

This transceiver is capable of storing a maximum of 100 messages in memory. You can easily access one of those.

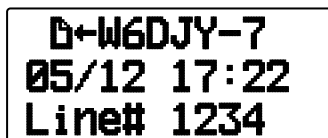
- 1 Press **[MSG]**.
 - The message list appears on the display.
- 
- 1BW6DJY-9
2+W4DJY-7
3+W4DJY-9
- 2 Press **[▲]/[▼]** or rotate the **Tuning** control to select the desired message using the cursor (►).
 - Press **[ESC◀]** or **[PTT]**: Re tun to the frequency display.
 - Press **[MSG]**: Makes the Reply message.
 - Press **[POS]**: Displays the detailed data of the message transmit station.
 - Press **[A/B]**: Deletes the selected message.
 - "Clear?" appears then press **[►OK]** to clear.
 - Press **[A/B] (1s)**: Deletes all messages.
 - "Clear All?" appears. Press **[►OK]**, "Sure?" appears then press **[►OK]** to clear all.
 - 3 Press **[►OK]**.
 - If you select an incoming message, the following display appears:



BW6DJY-7
I will come
tomrrow what

- Rotate the **Tuning** control: Scrolls the message.

- Press **[ESC◀]**: Re tun to the message list.
- Press **[►OK]**: Displays the next page.
- Press **[MSG]**: Responds to the party from whom you received. Enters into message setting.
- Press **[A/B]**: Deletes the selected message.
- Press **[PTT]**: Re tun to the frequency display.
- Press **[POS]**: If position data is available within the station list, it will be displayed while the current message of the transmitting station is displayed.
- If you select last page, the following display appears (Sended date/ time/ line number):



BW6DJY-7
05/12 17:22
Line# 1234

- If you select one of your outgoing messages, the following display appears:



*BW6DJY-9
I'm free thi
s afternoon

- Rotate the **Tuning** control: Scrolls the message.
- Press **[ESC◀]**: Re tun to the message list.
- Press **[►OK]**: Displays the next page.
- Press **[MSG]**: Responds to the party from whom you received. Enters into message setting.
- Press **[A/B]**: Makes the transmitted message.
- Press **[PTT]**: Re tun to the frequency display.
- Press **[POS]**: If position data is available within the station list, it will be displayed while the current message of the transmitting station is displayed.

BASIC SETTINGS

■ My Callsign

Program your callsign using a maximum of 9 alphanumeric characters. You may include SSID characters in the string. Unless you program a callsign, you cannot transmit APRS packets.

- 1 Access Menu 300.



```
Basic Set 300
▶ My Callsign
  Beacon Type
    APRS Lock
      W6DJY-9
```

- The display for entering a callsign appears; the first digit blinks. The default is "NOCALL".
- 2 Press [**▲**]/[**▼**] or rotate the **Tuning** control to select the first digit.
 - You can enter 0 to 9, A to Z, and –.
 - 3 Press [**▶OK**].
 - The cursor moves to the next digit.
 - 4 Repeat steps 2 and 3 to enter up to 9 digits.

■ Beacon Type

Access Menu 301.



```
Basic Set 301
My Callsign
▶ Beacon Type
  APRS Lock
    APRS
```

APRS: Beacons are transmitted in APRS format when the "APRS" icon appears on the upper left of the display. Additionally, in Menu mode, only those menus which can be set with APRS are displayed.

NAVITRA: Beacons are transmitted in NAVITRA format when the "NAVITRA" icon appears on the upper left of the display. Additionally, in Menu mode, only those menus which can be set with NAVITRA are displayed.

■ APRS Lock

This function prevents accidentally changing the built-in data band frequency or accidentally transmitting on the data band by pressing [**PTT**].

The "APRS lock" appears when APRS lock is activated.

Access Menu 302.



```
Basic Set 302
My Callsign
  Beacon Type
    APRS Lock
      On
```

On: The frequency of the built-in data band cannot be changed.

(You also cannot perform Scan with [**VFO**], [**MR**], [**ENT**], [**MHz**], or the **Tuning** control.)

On & PTT: The frequency of the built-in data band cannot be changed. You cannot transmit on the data band by pressing [**PTT**].

On & TNC: The frequency of the built-in data band cannot be changed. While in APRS mode, pressing [**TNC**] will not exit APRS mode.

On & PTT & TNC: The frequency of the built-in data band cannot be changed. You cannot transmit on the data band by pressing [**PTT**]. While in APRS mode, pressing [**TNC**] will not exit APRS mode.

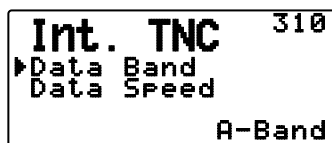
- When the data band is set as the cross band, both band frequencies cannot be changed and you cannot transmit using [**PTT**].
- During APRS lock, you cannot change the CTCSS/DCS setting of the data band.
- During APRS lock, you cannot change the DUAL setting of the non-data band.

Off: Changes the internal Data Band frequency so that you can transmit on the internal Data Band by pressing [**PTT**].

SETTING INTERNAL TNC

■ Data Band

Access Menu 310.

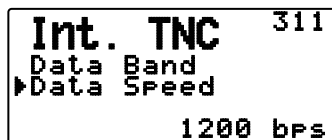


On this transceiver you can select data band for APRS mode independent of the selection for Packet mode. Select band A or B as the data band for receiving or transmitting APRS packets. The default is band A. "A" indicates the current data band.

Note: In Menu 310, the selection switches among A-Band, B-Band, A:TX B:RX, and A:RX B:TX. Select A:TX B:RX or A:RX B:TX if APRS networks which use two separate frequencies become available in the future.

■ Packet Transfer Rate

Access Menu 311.

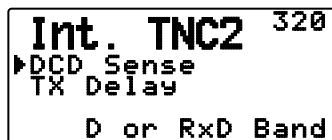


The default APRS packet transfer rate set on the built-in TNC is 1200 bps which is the standard among the current APRS networks.

Note: You can also set the Packet transfer rate to 9600bps when necessary.

■ DCD Sense

Access Menu 320.



You can also select the method for inhibiting the built-in TNC from transmitting.

D or RxD Band: When the data band is no longer busy (as per the steps below), the packet is transmitted.

- ① Press [PTT] to enter transmit mode.
- ② The data band is busy.

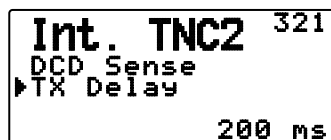
Both Band: When the bands are no longer busy (as per the steps below), the packet is transmitted.

- ① Press [PTT] to enter transmit mode.
- ② The data band is busy.
- ③ The other band is busy.

Ignore DCD: Transmission from the built-in TNC is not inhibited. The packet is transmitted immediately.

■ TX delay time

Access Menu 321.



This function allows you to set a transmission delay time between transmitting the APRS data and transmitting a flag code prior to the APRS data. When the other station has activated their Save Mode, set a longer delay time.

SETTING COM PORT

■ Baud Rate

Access Menu 330.



Set the communication speed of the external GPS or other equipment that is connected to the GPS terminal. The speed is set to 4800 bps (NMEA)/ 9600 bps (IPS format: SONY) when a GPS receiver is connected.

- It does not correspond to the Gamin-TXT format.

■ Input Type

Access Menu 331.



Off: You can perform APRS communications without the use of an external GPS receiver or Weather Station. Set your station position data manually through Menu 360 (MY Position) or use the internal GPS receiver.

GPS: You can perform APRS communications using an external GPS receiver. Verify your station position data by pressing the [POS] key.

Weather (Davis): You can perform APRS communications using a Davis Weather Station. Verify your station weather data by pressing the [F], [POS] key.

- Operation verification model (as of November 2011) Vantage PRO2™
- Please use the Data Logger bundled with "WeatherLink® for Vantage Pro2™, Windows, Serial Port" (Davis Part No.06510SER) or "WeatherLink® for APRS, with Streaming Data Logger" (Davis Part No.06540) with Vantage PRO2™.
- When using the "WeatherLink® for APRS, with Streaming Data Logger" (Davis Part No.06540) Data Logger, set the Baud Rate (Menu 330) to 9600bps for stable operation.

Weather (PeetBros.): You can perform APRS communications using a PeetBros Weather Station. Verify your station weather data by pressing the [F], [POS] key.

- Operation verification model (as of November 2011) ULTIMETER® 2100 (Packet mode)

■ Output Type

Access Menu 332.

```
COM Port 332
Baud Rate
Input
▶Output Off
```

Waypoint: Waypoint/ DGPS information is forwarded. The callsign and positioning data received from another station can be displayed as the waypoint data through the device connected to your GPS receiver or on the GPS receiver display.

Note: When Menu No. 331 is set to "Off" or Weather Station Unit is selected, the Way Point data is not output.

SETTING WAY POINT

■ Way Point Format

Access Menu 340.

```
Waypoint 340
▶Format
Length
Output NMEA
```

Select the type of Way point Format that is sent.

NMEA: The data which is output from the GPS terminal using the NMEA-0183 "\$GPWPL" format.

MAGELLAN: The data which is output from the GPS terminal using the "\$PMGNWPL" format.

KENWOOD: The data which is output from the GPS terminal using the "\$PKWDWPL" format.

■ Way Point Length

Access Menu 341.

```
Waypoint 341
Format
▶Length
Output 6-Char
```

Select the length of the Way Point Name. The length can be set as "6-Char", "7-Char", "8-Char", or "9-Char".

■ Way Point Output

Access Menu 342.

```
Waypoint 342
Format
Length
▶Output All
```

All: All Way point information is sent.

Local: If the position limit is ON, all the data within the position limit is sent. If the position limit is OFF, all Way point data is sent.

Filtered: Information that is permitted using the packet filter is output as Way point information.

PC PORT ON/OFF

■ Output

Access Menu 350.

```
PC Port 350
▶Output Off
```

This function outputs data from the PC (USB) port <Baud rate: 9600 bps> after receiving packet and TNC command data from the APRS data communications. Use this function to verify the received data from the transceiver.

PROGRAMMING POSITION DATA

■ Select Position channel

Access Menu 360.

```
MyPosition 360
▶*1 JJ00AA
Name :
N 00°00.00'
W 000°00.00'
```

This transceiver has 5 memory channels for storing position data. Program latitude and longitude data for up to 5 locations from which you will often transmit APRS packets. You can also name the 5 memory channels.

■ Name Entry

Access Menu 361.

```
MyPosition 361
*1 JJ00AA
▶Name : ▶Home
N 00°00.00'
W 000°00.00'
```

You can enter alphanumeric characters plus special ASCII characters (up to 8 digits).

■ Latitude Entry

Access Menu 362.

```
MyPosition 362
*1 JM03AP
▶Name Home
N 33°39.28'
W 000°00.00'
```

<Menu 3W0: "dd°mm.mm' ">

```
MyPosition 362
*1 JM03AP
▶Name: Home
N 33°39'28.0"
W 000°00'00.0"
```

<Menu 3W0: "dd°mm'ss.s" ">

The north/ south latitude is entered.

■ Longitude Entry

Access Menu 363.

```
MyPosition 363
*1          EM73SP
Name       Home
N          33°39.28'
W          084°27.08'
```

<Menu 3W0: "dd°mm.mm' ">

```
MyPosition 363
*1          EM73SP
Name:      Home
N          33°39.28.0"
W          084°27.08.0"
```

<Menu 3W0: "dd°mm'ss.s' ">

The east/ west longitude is entered.

SETTING BEACON INFORMATION

■ Speed Information

Access Menu 370.

```
BeaconInfo 370
Speed
Altitude
Pos. Ambiguity On
```

Select whether or not to transmit speed information when using APRS data communications.

■ Altitude Information

Access Menu 371.

```
BeaconInfo 371
Speed
Altitude
Pos. Ambiguity On
```

Select whether or not to transmit altitude information when using APRS data communications.

- When the beacon type is "NAVITRA", this information will not appear on the display.

■ Position Ambiguity

Access Menu 372.

```
BeaconInfo 372
Speed
Altitude
Pos. Ambiguity 1-Digit
```

There may be cases where you do not know or do not want to report your precise locations. For position data, you can select the number of digits not to be included in your packets. Select 1 to 4, or Off (default). The table shows how the digits are cleared.

OFF	1-Digit	2-Digit	3-Digit	4-Digit
33°50.43	33°50.4	33°50.	33°5X.	33° .
118°13.72	118°13.7	118°13.	118°1X.	118° .

- When the beacon type is "NAVITRA", this information will not appear on the display.

SELECTING A POSITION COMMENT

Access Menu 380.

```
Comment 380
Position Comment

Off Duty
```

The APRS data which you transmit always includes one of the 15 predetermined position comments. Select an appropriate comment depending on your situation.

The selectable comments are listed below:

"Off Duty", "Enroute", "In Service", "Returning", "Committed", "Special", "PRIORITY", "CUSTOM 0 ~ CUSTOM 6" or "EMERGENCY!"

- If you select "EMERGENCY!", a confirmation message appears. Press [►OK] again.

```
Comment 380
Position Comment

Are you sure?
EMERGENCY!
```

ATTENTION:

When it is unnecessary, never select "EMERGENCY!". When an emergency signal is received using APRS, the Emergency Alarm on all stations will sound.

STORING STATUS TEXT

Status text is another comment to transmit with position data. Unlike a position comment, you can make any desired comment using a maximum of 42 alphanumeric characters. This transceiver has 5 memory channels for preprogramming.

- 1 Access Menu 3A0.

```
StatusText 390
▶*1 TX Rate : 1/1
Text :
```

- 2 Select a status text number.
 - Press **[MHz]** to mark the currently used status text with (✱).
- 3 Select the frequency on which to transmit the status text when the APRS beacon is transmitted. You can select "Off" or "1/1" ~ "1/8" (APRS only).

```
StatusText 390
*1▶TX Rate : 1/2
Text :
```

- 1/X means the status text will be transmitted X number of times.
- 4 Enter your status text.

```
StatusText 390
*1 TX Rate : 1/2
▶Text :▶
░░░░░░░░░░░░░░░░░░░░
░░░░░░░░░░░░░░░░░░░░
```

QSY FUNCTION

The QSY function uses AFRS (Automatic Frequency Reporting System) to report a frequency on which voice communications can be established. A station using the QSY function embeds the frequency information in a position beacon transmission. A receiving station of this information can change frequency, or QSY, over to the reported voice frequency to begin voice communication by the select of **[Tune]**.

Transmitting QSY Information

A properly configured functioning TM-D72 QSY station can automatically embed the voice frequency from the non-data band to the beginning of status text. This is the mechanism used for automatically transmitting the frequency information.

The format of the transmitted frequency is FFF.FFF MHz.

So, for example, if at the time of a beacon transmission, the non-data band has a frequency of 446.100 MHz selected, then the frequency of "446.100MHz" gets embedded to the beginning of the status text. If you configure in any of Statuses 1 through 4 the frequency of "446.100MHz" at the beginning of the status text messages, then this fixed frequency will be transmitted as QSY information along with the beacon transmission. In addition to frequencies, there are fields where you can send other settings such as Wide/Narrow, Tone/CTCSS/DCS, Shift (+/-), and Offset frequency simply by -leaving one space between each value. Therefore, other information besides just a frequency can be sent.

QSY Information Format:

(Insert one space after the frequency before entering Wide/Narrow, Tone/CTCSS/DCS and Shift/Offset.)

- "T079": An upper case "T" indicates Wide. Tone frequency of 79.7 Hz. (Encoding)
- "t079": A lower case "t" indicates Narrow. Tone frequency of 79.7 Hz. (Encoding)
- "tOFF": A lower case "t" indicates Narrow. Tone = OFF (Without any tone Encoding or Decoding.)
- "C079": An upper case "C" indicates Wide. CTCSS frequency of 79.7 Hz. (Encoding/ Decoding)
- "c079": A lower case "c" indicates Narrow. CTCSS frequency of 79.7 Hz. (Encoding/ Decoding)
- "D023": An upper case "D" indicates Wide. DCS code of 023. (Encoding/ Decoding)
- "d023": A lower case "d" indicates Narrow. DCS code of 023. (Encoding/ Decoding)
- "+" : Plus Shift (A default offset frequency is applied.)
- "-" : Minus Shift (A default offset frequency is applied.)
- "+500" : Plus Shift, 5 MHz Offset
- "-060": Minus Shift, 600 kHz Offset

The value of the Offset shall be a 3-digit number. (x 10 kHz/ 50 kHz step)

Refer to the website for QSY Information Format:
<http://aprs.org/info/freqspec.txt> (as of November 2011)

■ QSY Transmission Operation

- 1 Access Menu 3A0.

```
QSY(FREQ) 3A0
►QSY in Status
Tone/Narrow
Shift/Offset Off
```

- 2 Set it to "On".
- 3 Access Menu 3A1.

```
QSY(FREQ) 3A1
QSY in Status
►Tone/Narrow
Shift/Offset Off
```

- 4 Set it to "On" or "Off".
- 5 Access Menu 3A2.

```
QSY(FREQ) 3A2
QSY in Status
►Shift/Offset Off
```

- 6 Set it to "On" or "Off".

■ Operation when Receiving a QSY

When QSY (frequency) information is received, the station list appears with the verified frequency. Select [Tune], then press [►OK].

```
1:W6DJY
►Tune 446.000
Sort
```

- The QSY (frequency) is set to the non data band.

Note: When using 6.5 kHz or 12.5 kHz step values, the display does not indicate values for 100 Hz and lower.

SETTING PACKET FILTER

■ Position Limit

Access Menu 3B0.

```
Pkt. Filter 3B0
►Position Limit
Filter Type
50 km
```

If APRS is popular in your area, you may receive too many APRS packets for a short period. If this disturbs your APRS activities, specify a distance from your location. You will not receive APRS packets from stations beyond this distance.

Select the range from 10 to 2500 in steps of 10, plus OFF (default). The unit is mile or kilometer depending on the selection in Menu 3V0 (Units 1).

■ Packet Filter Type

- 1 Access Menu 3B1.

```
Pkt. Filter 3B1
Position Limit
►Filter Type
*Weather
```

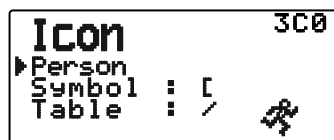
- 2 Select the Filter type to "Weather", "Digipeater", "Mobile", "Object", "Navitra", "1-WAY", or "Others".
- 3 Press [►OK].
 - When you press [MHz], the "✱" icon appears on the left side of the Filter type.

The APRS position data is filtered.

- Check the type(s) you want to receive.
- If all types are checked, you will receive all types of data.

SELECTING YOUR STATION ICON

Access Menu 3C0.



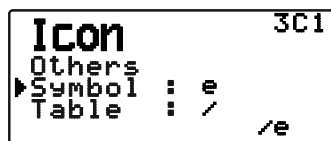
Select an icon which will be displayed on the monitors of other stations as your ID. You may select an icon depending on your current location.

It is important that the icon conveys the operational status of the station as well as the SSID. You can display and set the following icons for the TH-D72.

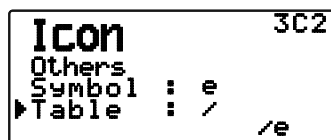
KENWOOD (\K)	Eyeball (/E)
Lighthouse (\L)	School (/K)
Satellite (\S)	PC user (/L)
SUNNY (\U)	Balloon (/O)
RADIO (\Y)	Police (/P)
ARRL (\a)	RV (/R)
RACES (\c)	SHUTTLE (/S)
Gale Flags (\g)	SSTV (/T)
HAM store (\h)	Sailboat (/Y)
WorkZone (\j)	Person (/I)
Speedpost (Value Singpost) (\m)	DF station (/A)
Triangle (\n)	WX (Weather station) (/_)
Small circle (\o)	Dish Antenna (/)
Tornado (\t)	Bicycle (/b)
Wreck (\x)	HOSPITAL (/h)
Sheriff (/!)	Jeep (/j)
Digipeater (/#)	Truck (/k)
GATEway (/&)	Mic-E Repeater (/m)
Aircraft (/')	Node (/n)
Red Cross (/+)	ROVER (/p)
Home (/ -)	QSO Repeater (/r)
X (/.)	Boat (/s)
Red Dot (/I)	Truck (18-wheeler) (/u)
Fire (/:)	Van (/v)
Portable (Tent) (/;)	Big Question Mark (\.)
Motorcycle (/ <)	IRLP/EchoLink (\0)
REILROAD ENGINE (/ =)	APRStt (\A)
Car (/ >)	
BBS (/B)	
Canoe (/C)	

APRS supports approximately 200 icons. It allows users to select each icon by specifying a combination of two ASCII codes, for example, ! and /. One is a symbol code, and the other is a table identification code (either / or \). If you select "Others", use the following procedures:

- 1 Access Menu 3C1.
- 2 Select a symbol code, then press [▶OK].

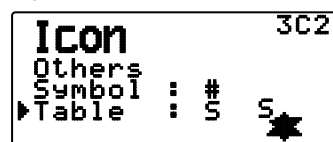


- 3 Select a a table identification code.



• Overlay Icon Setting

For example, to set the Digipeater icon to the letter "S", select "Others" under the icon type menu, select "#" under "Symbol", then select "S" under "Table".



Note:

- ◆ APRS icon codes (symbols/tables) are sometimes updated. Please refer to the following official APRS website (as of November 2011):
<http://www.aprs.org/symbols/symbolsX.txt>
<http://aprs.org/symbols/symbols-new.txt>
- ◆ Set an icon that represents your operational status. (For example, setting an Aircraft icon or Balloon icon to a fixed station will cause confusion when a station receives a beacon.)

SETTING TX BEACON

■ Packet Transmit Method

Access Menu 3D0.



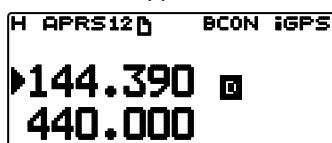
Select the operation method for transmitting APRS packets. The table concludes how operations differ depending on the selection.

Manual:

Each press of [BCON] transmits your APRS packet.

PTT:

- 1 Press [BCON] to switch the function ON.
 - "BCON" appears and blinks.



- 2 Press and hold [PTT], then speak into the microphone.
- 3 Release [PTT].
 - Releasing the switch transmits your APRS packet.
 - You cannot retransmit an APRS packet unless the time selected in < Initial Interval > passes. Wait until "BCON" starts blinking to indicate transmitting is ready.
- 4 To switch the function OFF, press [BCON] again.

Auto:

- 1 Press [BCON] to switch the function ON.
 - "BCON" appears.
 - Switching the function ON transmits your APRS packet once. After that, APRS packets are automatically transmitted at intervals of the period selected in < Initial Interval >.
- 2 To switch the function OFF, press [BCON] again.

SmartBeaconing:

- 1 Press [BCON] to switch the function ON.
 - "BCON" appears and blinks.
 - After manually transmitting your station position data 1 time, your position data will be automatically transmitted using the time interval set under "SmartBeaconing" (Menu Nos. 3F0 ~ 3G2).
- 2 To switch the function OFF, press [BCON] again.

Note: After setting "SmartBeaconing", the TX Interval Time, Decay Algorithm and Proportional Pathing features will no longer operate.

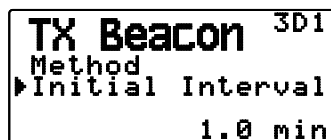
■ Quick Beacon

When setting "Method" to any value other than "Manual", you can manually transmit the Beacon.

Press [F], [BCON] transmits your APRS packet.

■ Initial Interval Time

Access Menu 3D1.



You can change the interval for automatically transmitting APRS packets. Select to 0.2, 0.5, 1, 2, 3, 5, 10, 20, 30 or 60 minutes. The default is 1 minute.

Note:

- ◆ With "Auto" in < Method > and Beacon ON, pressing [▶OK] to complete the setting causes the APRS packet to be immediately transmitted. After that, APRS packets are transmitted at intervals of the selected period.
- ◆ While signals are present, an APRS packet is not transmitted after the interval. After signals drop, transmitting is executed.

SETTING ALGORITHM

■ Decay Algorithm

Access Menu 3E0.



This function continuously extends the packet transmission interval in the case that there is no change of position information.

- When the position data does not change, the data is transmitted based on a Decay Algorithm (ex. Interval Time = 1 minute: 2 minutes, 4 minutes, 8 minutes, 16 minutes, 32 minutes, 32 minutes, 32 minutes, etc.)
- When My station position data changes, the data is transmitted using an interval time based on the set Initial Interval.
- When the set time elapses and transmission is performed but a busy signal is present, the transceiver does not transmit. When there is no longer a busy signal, the transceiver attempts to transmit.

Note:

- ◆ While transmitting by pressing the [PTT] switch, beacon transmission is reserved.
- ◆ If My callsign is not set, the APRS packet will not be transmitted.
- ◆ Independent of this interval, the transmission of the message is in 1 minute intervals.

■ Proportional Pathing

Access Menu 3E1.

```
Algorithm 3E1
Decay Algorithm
Prop.Pathing
On
```

This function automatically changes the transmit packet path with the elapsed time.

Operation example for when <Proportional Pathing> = ON

Transmission interval is 2 minutes. (When the <Decay Algorithm> = ON, the decay transmission interval takes precedence.)

The packet path changes with each transmission as shown below (when the packet path is set as WIDE1-1, WIDE2-1).

2 minutes : DIRECT

4 minutes : WIDE1-1 (1 Hop)

6 minutes : DIRECT

8 minutes : WIDE1-1, WIDE2-1 (2 Hops)

10 minutes : DIRECT

12 minutes : WIDE1-1 (1 Hop)

14 minutes : DIRECT

16 minutes : WIDE1-1, WIDE2-1 (2 Hops)

This is repeated.

When jointly using a Decay Algorithm, if the speed is 1 knots or slower, a Decay Algorithm pattern is used for transmitting, but if the speed is 3 knots or faster, it changes to Proportional Pathing.

SETTING SmartBeaconing™

Set to use "SmartBeaconing" (Menu 3D0) with APRS data transmission.

This function optimizes beacon transmission based on driving direction and speed. Use this function when you want to track your transmissions, especially for optimizing crossover beacon transmission intervals.

< SmartBeaconing™ from HamHUD Nichetronix >

■ Low speed / High speed

Access Menu 3F0.

```
SmartBcon1 3F0
Low/High Speed
Slow Rate
Fast Rate
26 - 30 km/h
```

Low speed setting (2 ~ 30 <mi/h, km/h or knots>).

When the speed is lower than this, beacons are transmitted at the time interval specified under "Slow Rate".

High speed setting (2 ~90 <mi/h, km/h or knots>).

When the speed is faster than this, beacons are transmitted at the time interval specified under "Fast Rate".

Note: To select the speed setting of the units, access Menu 3V0 (Units 1 - Speed, Distance).

■ Slow rate

Access Menu 3F1.

```
SmartBcon1 3F1
Low/High Speed
Slow Rate
Fast Rate
30 min
```

Low speed transmission interval time (1 ~ 100 minutes).

■ Fast rate

Access Menu 3F2.

```
SmartBcon1 3F2
Low/High Speed
Slow Rate
Fast Rate
30 sec
```

High speed transmission interval time (10 ~ 180 seconds).

■ Turn angle

Access Menu 3G0.

```
SmartBcon2 3G0
Turn Angle
Turn Slope
Turn Time
28 deg
```

Driving direction change, minimum value setting (5 ~ 90 degrees).

■ Turn slope

Access Menu 3G1.

```
SmartBcon2 3G1
Turn Angle
Turn Slope
Turn Time
245 (deg/speed)
```

Driving direction change, additional value setting (1 ~ 255 (10degrees/speed)).

■ Turn time

Access Menu 3G2.

```
SmartBcon2 3G2
Turn Angle
Turn Slope
Turn Time
30 sec
```

Minimum time delay between each beacon transmission by change of direction. (5 ~ 180 seconds).

Note: Adjust the Setting values to match the actual driving status.

SmartBeaconing Operation:

Speed	Transmission Interval	Corner Pegging
Above the <High Speed>	<Fast Rate>	Operates normally
Under <High Speed> Over <Low Speed> (Only when the set <High Speed> \geq <Low Speed>)	The interval is calculated using the following formula: (Transmission Interval = <Fast Rate> x <High Speed> \div Speed)	Operates normally
Below the <Low Speed>	<Slow Rate>	Will not operate

Transmission Interval Example:

(with <Low Speed> = 5, <High Speed> = 70, <Slow Rate> = 30 min, <Fast Rate> = 120 sec)

Speed	Interval
80	120 seconds (2 minutes)
70	120 seconds (2 minutes)
50	168 seconds (2 minutes 48 seconds)
30	280 seconds (4 minutes 40 seconds)
20	420 seconds (7 minutes)
10	840 seconds (14 minutes)
5	1680 seconds (28 minutes)
0	1800 seconds (30 minutes)

Corner Pegging Operation Example:

(with <Turn Angle> = 30° <Turn Slope> = 24)

Speed	<Turn Slope>	<Turn Slope> \div Speed (1)	<Turn Angle> (2)	Turn Threshold (3)=(1)+(2)
60	24 (x10)	4°	30°	34°
50	24 (x10)	6°	30°	36°
30	24 (x10)	8°	30°	38°
20	24 (x10)	12°	30°	42°
10	24 (x10)	24°	30°	54°
5	24 (x10)	48°	30°	78°

- When the value of "Turn Threshold" exceeds 120°, it is calculated as 120°.

PROGRAMMING A PACKET PATH

Access Menu 3H0.

```

PacketPath 3H0
Type : *New-N
WIDE1-1 : On
Total Hops : 2
[WIDE1-1,WIDE2-1]

```

Select the packet path type from "New-N", "Relay", "Region", or "Others".

When you press [MHz], the "✱" icon appears on the left side of the packet path type, showing the current used information.

New-N:

This digipeat type has been used mainly in North America, but is now used worldwide.

- Set the <Type> to "New-N", then press [MHz].

```

PacketPath 3H0
Type : *New-N
WIDE1-1 : On
Total Hops : 2
[WIDE1-1,WIDE2-1]

```

- Set <WIDE 1-1> to "Off" or "On".

```

PacketPath 3H1
Type : *New-N
WIDE1-1 : On
Total Hops : 2
[WIDE1-1,WIDE2-1]

```

- Set <WIDE 1-1> to "On" to use the digipeater of the Fill-in type (RELAY type) with <New-N>.
- When set to "On", 1 packet path in addition to <WIDE 1-1> can be used, as per the <Total Hops> setting.

- Select the relay step number for the <Total Hops> setting.

```

PacketPath 3H2
Type : *New-N
WIDE1-1 : On
Total Hops : 2
[WIDE1-1,WIDE2-1]

```

- You can confirm the setting contents in [].

Relay:

This is one of the digipeat types used in Europe.

- 1 Set the <Type> to "Relay", then press [MHz].

```
PacketPath 3H0
▶Type : *Relay
RELAY : On
Total Hops : 2
[RELAY, TRACE2-1 ]
```

- 2 Set <RELAY> to "Off" or "On".

```
PacketPath 3H1
Type : *Relay
▶RELAY : On
Total Hops : 2
[RELAY, TRACE2-1 ]
```

- Set <RELAY> to "On" to use the digipeater of the Fill-in type (RELAY type) with the <Relay>.
- When set to "On", 1 packet path in addition to RELAY can be used, as per the <Total Hops> setting.

- 3 Select the relay step number for the <Total Hops> setting.

```
PacketPath 3H2
Type : *Relay
RELAY : On
▶Total Hops : 2
[RELAY, TRACE2-1 ]
```

- You can confirm the setting contents in [].

Region:

Use this method when the packet is being relayed within only a limited area.

Packet paths are specified using ABBR (abbreviations). (In America, for example, CA represents California, AZ represents Arizona, etc.)

- 1 Set the <Type> to "Region", then press [MHz].

```
PacketPath 3H0
▶Type : *Region
ABBR :
Total Hops : 2
[2-2 ]
```

- 2 Using the ABBR setting, enter an abbreviation of up to 5 characters.

```
PacketPath 3H1
Type : *Region
▶ABBR : CA
Total Hops : 2
[2-2 ]
```

- 3 Select the relay step number for the <Total Hops> setting.

```
PacketPath 3H2
Type : *Region
ABBR : CA
▶Total Hops : 2
[CA2-2 ]
```

- You can confirm the setting contents in [].

Others:

Use this method when the relay path is specified to an individual.

When a character string is not entered, the packet data is not relayed.

- 1 Set the <Type> to "Others", then press [MHz].

```
PacketPath 3H0
▶Type : *Others
PATH :
```

- 2 Enter a path.

```
PacketPath 3H1
Type : *Others
▶PATH : W5DJY-1
[ ]
```

- A Packet path is the digipeat route of the packet data sent from My station.

For example, if you want your packet to take the [W5DJY-1] > [W4DJY-1] route, enter [W5DJY-1, W4DJY-1], separating each digipeater callsign with a comma.

NETWORK

Access Menu 3I0 and 3I1.

```
Network 3I0
▶*APRS [APK003]
Altnet [ ]
```

```
Network 3I1
*APRS [APK003]
▶Altnet [ ]
[ ]
```

Set APRS data communications UNPROTOCOL. UNPROTOCOL is the method in which packet data is transmitted without other stations or making a connection.

Select either "APRS(APK003)" or "Altnet".

APRS: (Use this setting for normal use: default setting)

When transmitting messages and meteorological data using the TH-D72, "APK003 is added to the packet, following your station callsign.

There are no restrictions on received packets.

Altnet: When it is necessary to add restrictions to received packets, you can set it for special use.

Select "Altnet" and press [MHz], then enter your desired character string.

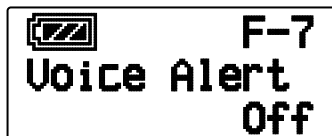
When transmitting messages and meteorological data using the TH-D72, the character string you entered is added to the packet, following your station callsign.

VOICE ALERT

This function will notify another station as to whether or not they are within communications range by emitting beacon tones.

When a Mobile Station is mobile with the Voice Alert function turned ON, other stations also with Voice Alert turned ON will hear the beacon sound of the Mobile Station if they have matching tone (CTCSS) frequencies and are within range, thus informing the stations that communications is possible.

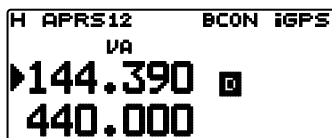
Press [F], [REV].



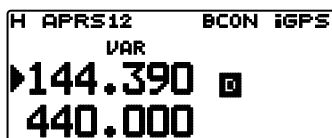
You can set Voice Alert to "Off", "On" or "RX Only". When using this function, you can also change the tone frequency, press [F], [8] [TONE]. (The default is 100Hz.)

Off: Voice Alert is disabled.

On: A tone frequency is added to the transmitted packet. "VA" appears above the displayed frequency.



RX Only: A tone frequency is not added to the transmitted packet. "VAR" appears above the displayed frequency.



Note:

- ◆ When the built-in data band is set to cross band, the Voice Alert function does not operate.
- ◆ Voice alert takes precedence even when TONE, CTCSS and DCS are set.
- ◆ When Voice alert is ON, you cannot perform TONE or CTCSS frequency selection and DCS code selection.
- ◆ When the packet speed is 9600 bps, the TONE will disrupt the demodulation of the packet. Set the packet speed to 1200 bps when using Voice Alert.

WEATHER STATION DATA OUTPUT

■ Transmit

Access Menu 3J0.



This setting determines whether or not to transmit the meteorological data obtained from the Weather Station, with the APRS data communication.

■ Transmit Interval Time

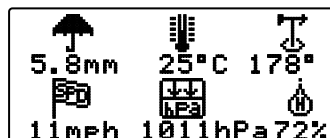
Access Menu 3J1.



Set the interval at which the meteorological data is transmitted with the APRS data communication.

The interval can be set to 5, 10, 30, or 60 minutes.

- The following meteorological data is transmitted:
 - Rainfall
 - Air temperature
 - Wind direction
 - Wind velocity
 - Atmospheric pressure
 - Humidity
- This data is transmitted with the APRS standard format (latitude/longitude and time information).
- You can verify the meteorological data being output by viewing "My Weather". (Press [F], [POS])



■ UITRACE

When using the TH-D72 as a digipeater, set whether or not UITRACE digipeat runs.

When the received UI Frame character string matches the entered alias (for example, WIDE), the number of hops (for example, 2-2) is processed and decreased by 1 (for example, WIDE2-2 becomes WIDE2-1), and your station callsign is added to the UI Frame.

- 1 Access Menu 3O0.



Uitrace 300
▶Uitrace
Alias
Off

- 2 Set <Uitrace> to "On" or "Off".

- 3 Access Menu 3O1.

- You enter Alias Setting mode.



Uitrace 301
Uitrace
▶Alias
WIDE

- 4 Enter the UITRACE alias.

- When running UITRACE digipeat, set the character string of the alias that is used.

STORING USER PHRASES

Access Menu 3P0.



Phrases 3P0
▶User Phrase1
User Phrase1
User Phrase2
User Phrase3
User Phrase4
User Phrase5
User Phrase6
User Phrase7
User Phrase8

This function (clipboard image) allows you to paste phrases into the APRS message compilation mode. You can create up to 8 phrases each of which can consist of up to 32 characters.

- The user phrase function can only be used in the message compilation mode.
- Before a message is copied, the number of letters cannot be guaranteed. Only the number of letters available will be copied, the remainder will be truncated.
- To copy a message, enter message compilation mode, press [F] to enter function mode, then press [1] (Paste 1), [2] (Paste 2), [3] (Paste 3), [4] (Paste 4), [5] (Paste 5), [6] (Paste 6), [7] (Paste 7), or [8] (Paste 8) key for 1 second to copy the message that has been set up for each key.
- If the user messages are not set up, they cannot be used.

STORING AUTO MESSAGE REPLY

While you are driving, for example, you cannot immediately answer to received messages. On this transceiver, you can program the message to be automatically returned when a message is received.

■ Reply

Access Menu 3Q0.



Auto-Reply 3Q0
▶Reply
Reply To
Delay Time
On

Set <Reply> to "On" or "Off".

- "AA:", meaning "Auto Answer message", is automatically added to the beginning of all auto-reply messages. This has been added, based on the recommendations of "APRS SPEC Addendum 1.1". Refer to <http://aprs.org/aprs11.html> for details.

■ Reply To Callsign

Access Menu 3Q1.



Auto-Reply 3Q1
Reply
▶Reply To
Delay Time
JA1YKX

When there is a message you would like to reply to for the specific callsign, preset that callsign for automatic responses.

- A reply will be sent to all matching stations when using the wildcard mark (*).
For example, if you enter JA1*, a response is sent to all callsigns beginning with JA1.

■ Reply Delay Time

Access Menu 3Q2.



Auto-Reply 3Q2
Reply
Reply To
▶Delay Time
10 sec

After a message has been received, if you operate the transceiver during the delay time, before the message is sent, the auto-reply message is canceled. You can set the wait time as 0, 10, or 30 seconds. The default setting is 10 seconds.

- When a message is received before the delay time has completed counting down, the timer will reset and begin counting down again.
- When multiple messages are received from the same caller before the delay time has completed counting down, only one message will be sent through auto-reply message.
- When the delay time is set to 0 seconds, auto-reply message will send a response immediately following an acknowledged received message.

■ Reply Text

Access Menu 3R0.

```
Reply Msg 3R0
▶Text :▶

```

- The display for entering a message appears; the first digit blinks.
- You can enter alphanumeric characters plus special ASCII characters.

PROGRAMMING A MESSAGE GROUP CODE

Access Menu 3S0 .

```
Group Fitr 3S0
▶Message
▶Bulletin (BLN)
ALL,QST,CQ,KWD

```

Use a message group code to exchange messages only among your group members. With one or more message group codes programmed, you will receive messages that include the same group code(s), besides messages addressed to you. If you program one or more bulletin group codes, you will not receive bulletins addressed to other specific groups. You can program any desired code using alphanumeric characters; up to 9 characters for messages, and up to 4 characters for bulletins. You can also program up to 6 codes at the same time; each code must be separated by a comma (.). If you program 3 message group codes, for example, you will receive all messages that include one of the 3 codes. If you program 3 bulletin group codes, you will reject bulletins addressed to specific groups which do not use any of the 3 codes.

```
Group Fitr 3S0
▶Message
▶Bulletin (BLN)

```

- You can enter 0 to 9, A to Z, , (comma), and -. For messages, "X" is also selectable.
- The keypad on the microphone also is available to enter alphanumeric characters.
- In order to include a message group code in your outgoing packet, enter a group code in place of a callsign. To include a bulletin group code, enter it following BLN#; for example, "BLN#ABC" where ABC is a group code. Use up to 9 characters for a message group code or up to 4 characters for a bulletin group code.

Note: Unlike a message, a bulletin including a group code will be received by stations who do not program any bulletin group code.

SETTING SOUND

■ RX Beep Type

Access Menu 3T0.

```
Sound 3T0
▶RX Beep
TX Beep
Special Call All

```

This transceiver beeps each time it receives any type of APRS packets.

Selection	Operation
Off	The APRS beep tone does not sound.
Message Only	Beep sounds only when a message is received at your station address.
Mine	Beep sounds when a message is received at your station address and your transmitted data is received by a digipeater.
All New	Beep sounds when a message is received at your station address and new packet data is received.
All	Beep sounds when a message is received at your station address and duplicate data or invalid data is received.

■ TX Beep

Access Menu 3T1.

```
Sound 3T1
RX Beep
▶TX Beep
Special Call Off

```

When a beacon containing your station position information (My position information) is transmitted in a manner other than manually, you can select whether or not it emits a beep sound.

Off: A beep does not sound.

On: A beep sounds when a beacon is transmitted using the PTT switch or when it is automatically transmitted. When auto-reply message sends a response, a beep (morse code A) will sound.

Note: Depending on the congestion level of the transmission channel, the transmission beep sound may be delayed when using the internal TNC DCD sense function.

■ Special Call Sound

Access Menu 3T2.

```
Sound 3T2
RX Beep
TX Beep
▶Special Call
JAIYKX

```

This function emits a special call sound when data is received at My station address. Set the callsign of the stations from which you want to receive special call notifications.

SETTING DISPLAY

■ Display Area

Access Menu 3U0.

```
Display      3U0
▶Display Area
  Interrupt Time
  Cursor Control
  Entire Disp
```

Selects the Display area.

Entire Always: The received new data, duplicate data, and My station data information appears on the full display, other data information appears only at the top of the display.

```
▶W6DJY-9
  Enroute to
  🚗 Hamfest.
```

Entire Disp: The received new data information appears on the full display, other data information appears only at the top of the display.

One Line: The received new data information appears only at the top of the display.

```
dP W6DJY-9
▶144.390 📶
  440.000
```

Note: When an emergency message or a message designated for your station is received, the received data information appears on the full display, even if the display method is set to "One Line".

■ Interrupt Time

Set the duration to display an indication for when new data is received. If you select "Infinite", the indication cannot be canceled.

Access Menu 3U1.

```
Display      3U1
Display Area
▶Interrupt Time
  Cursor Control
    10 sec
```

The Interrupt time can be set to 3, 5, 10 seconds or "Infinite".

■ Cursor Control

Select a cursor control setting for when receiving.

Access Menu 3U2.

```
Display      3U2
Display Area
  Interrupt Time
▶Cursor Control
    Followed
```

Followed: On the list screen, the cursor (▶) follows the callsign when receiving APRS data.

```
-STATION LIST-
▶ 1:W6DJY-9      15:08F
  2:JA1VKX-7     15:01F
  3:DF0TK-14     14:55
  4:W5DJY        14:52
  5:9U1KW-13     14:49
```

```
-STATION LIST-
▶ 2:W6DJY-9      15:08F
  3:JA1VKX-7     15:01F
  4:DF0TK-14     14:55
  5:W5DJY        14:52
  6:9U1KW-13     14:49
```

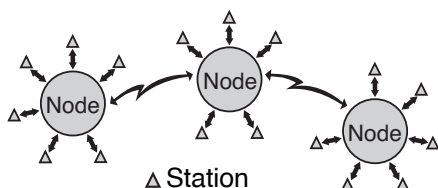
Fixed: On the list screen, the cursor (▶) sits at the list number when receiving APRS data.

```
-STATION LIST-
▶ 1:W6DJY-9      15:08F
  2:JA1VKX-7     15:01F
  3:DF0TK-14     14:55
  4:W5DJY        14:52
  5:9U1KW-13     14:49
```

```
-STATION LIST-
▶ 1:W3DJY-7      15:52F
  2:W6DJY-9      15:08F
  3:JA1VKX-7     15:01F
  4:DF0TK-14     14:55
  5:W5DJY        14:52
```


DX PACKETCLUSTERS MONITOR

DX PacketClusters are networks which consist of nodes and stations who are interested in DXing and contesting. If one station finds a DX station on the air, they will send a notice to their node. This node then passes the information to its local stations through another node. The DX PacketCluster monitor function receives the packet data of the DX cluster and displays the contents. This transceiver can retain the latest information on up to 10 DX stations, but the memory will be cleared when the transceiver power supply is turned Off. If you have a TS-590S, TS-480HX/SAT, TS-2000/X, TS-570S/D, or TS-870S HF transceiver, you can connect the TH-D72 to the HF transceiver to use the DX PacketCluster Tune function. You can use this function to monitor the latest DX information in your area, but it cannot be used to send DX information to a node.



- 1 Access Menu 310 (Int. TNC - Data Band) to select band A or B.
 - If the common transfer rate in your local PacketCluster network is 9600 bps, access Menu 311 (Int. TNC - Data Speed) and select "9600 bps".
- 2 Tune to the frequency of the target PacketCluster node.
- 3 Press **[TNC]** to enter APRS mode.
 - "APRS" should appear.
- 4 Press **[F]**, **[LIST]**.
 - Each time new DX cluster data is received, a callsign, frequency, and time are displayed.
 - When a duplicate DX cluster data is received, "DX" and a callsign are displayed.

DX:9U1KW
21295.0
0906Z

- 5 Press **[▶OK]**.
 - DX station detailed display mode

DX:9U1KW
Strong sig
S!

- Press **[ESC ◀]**: Restores the frequency display.
- Press **[MENU]**: Outputs the PCT data.

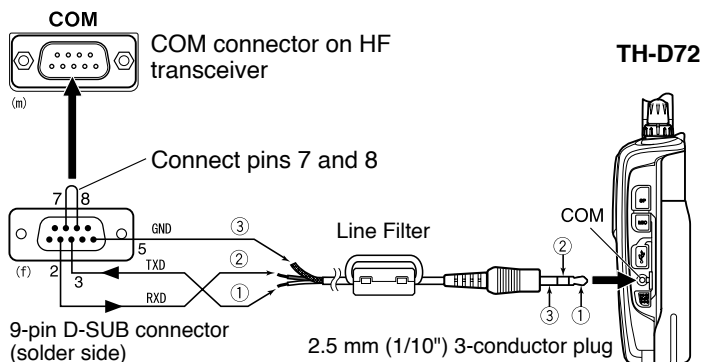
Note: The Packet Cluster data (PCT) is output only when Menu No.311-COM Port-input is set to "Off".

■ Connecting TH-D72 with the HF Transceiver

In order to connect TH-D72 to the HF transceiver, you need to prepare three cables by yourself.

The COM terminal on this transceiver accepts a 2.5 mm (1/10") 3-conductor plug. If necessary, use the cable (service part: E30-3400-XX) to modify the cable end of RS-232-C connector.

HF transceiver



- Attach the line filter to the cable.