GreenCube Terminal Program by OZ9AAR

MISSION STATEMENT

The sole purpose of the newest implementation of UHM (You Heard Me) in the Greencube Terminal program is to minimize transmissions which up until now have not been identifiable as unnecessary transmissions into what is a limited resource transponder on IO-117. That's it. Hopefully by doing this the transponder workload will be somewhat reduced and more real time RF to RF satellite contacts can be made by all stations on a pass.

CONCEPT

Telemetry has been available from IO-117 since its launch and activation in July of 2022. By using some of that information available it should be possible to decrease unnecessary transmissions on what has become a heavily utilized transponder by the amateur radio community. Given the current satellite's programming there are times when it is so heavily used that you may only see one or two digipeats come through between the transponders TLE transmissions every 45 seconds. The Greencube Terminal program can now send parts of that telemetry information to the Greencube Reporter Server (oscarwatch.org) to determine if a message was indeed received by the destination call sign as well as provide data to help visually identify (spot) current stations and their location on a pass in graphic form. You cannot see who a station is in contact with or which station may be calling you on this web site. You have the options to disable your participation in either sending telemetry to SatNOGS, which is completely unrelated to UHM, by disabling that function in the program, or not participating in having data sent to the Greencube Server by disabling the sending data function to the server in the program. The Greencube server is maintained by 2M0SQL and remains under development and can be viewed anytime, anywhere by anyone interested in its graphic display of stations on an IO-117 pass.

GreenCube Terminal Program (GC-T) will access the Greencube Server to obtain information about your own RF transmissions and whether or not a successful digipeat was actually heard by the station you are calling. This is similar to getting a signal report of your HF FT8 station from another specific station on PSK Reporter but with more precise real time information. Knowing that a station has heard you does not guarantee a contact BUT what it does do is inform you that you do not need to continue transmitting to that station again anytime soon. This fact alone should encourage a significant change in all of our behavior when it comes to trying to contact a station. If a single station were to decrease their transmissions by 5 per pass and with 50 to 60+ stations on a busy pass that translates to possibly 250 to 300+ fewer unnecessary digipeats overall in one pass.

UHM

What it is and How to Use It

No direct communication from station to station occurs over the internet. The direct communication is all done with RF from one station to the other station via the satellite transponder.

You Heard Me (UHM) technology will alert you to the fact that a station you were calling has actually copied your transmission. With this knowledge in hand you do not have to send any further repeat transmissions wondering whether your transmission was copied. If your signal was copied a Checkmark symbol will show up next to their call. If they did not copy you then a Stop Sign symbol will show up by their call. If a station does not have UHM enabled then no symbol will show up next to their call.

You must enable "forwarding statistics to server" (oscarwatch.org) in order for UHM to work. This is enabled in the Settings Menu, General tab: see Figure 1.

Figure 1
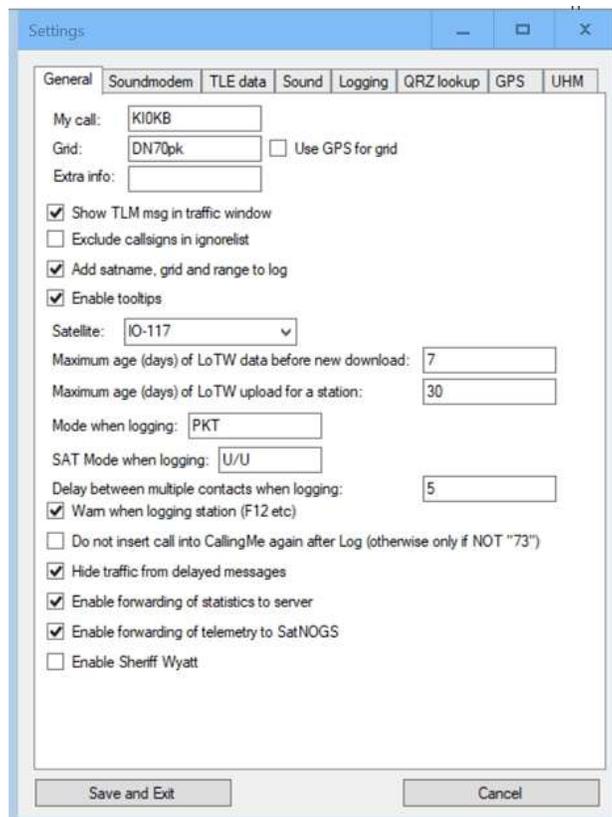
Additionally UHM must be enabled in the Setting Menu, UHM tab: see Figure 2.

Figure 2
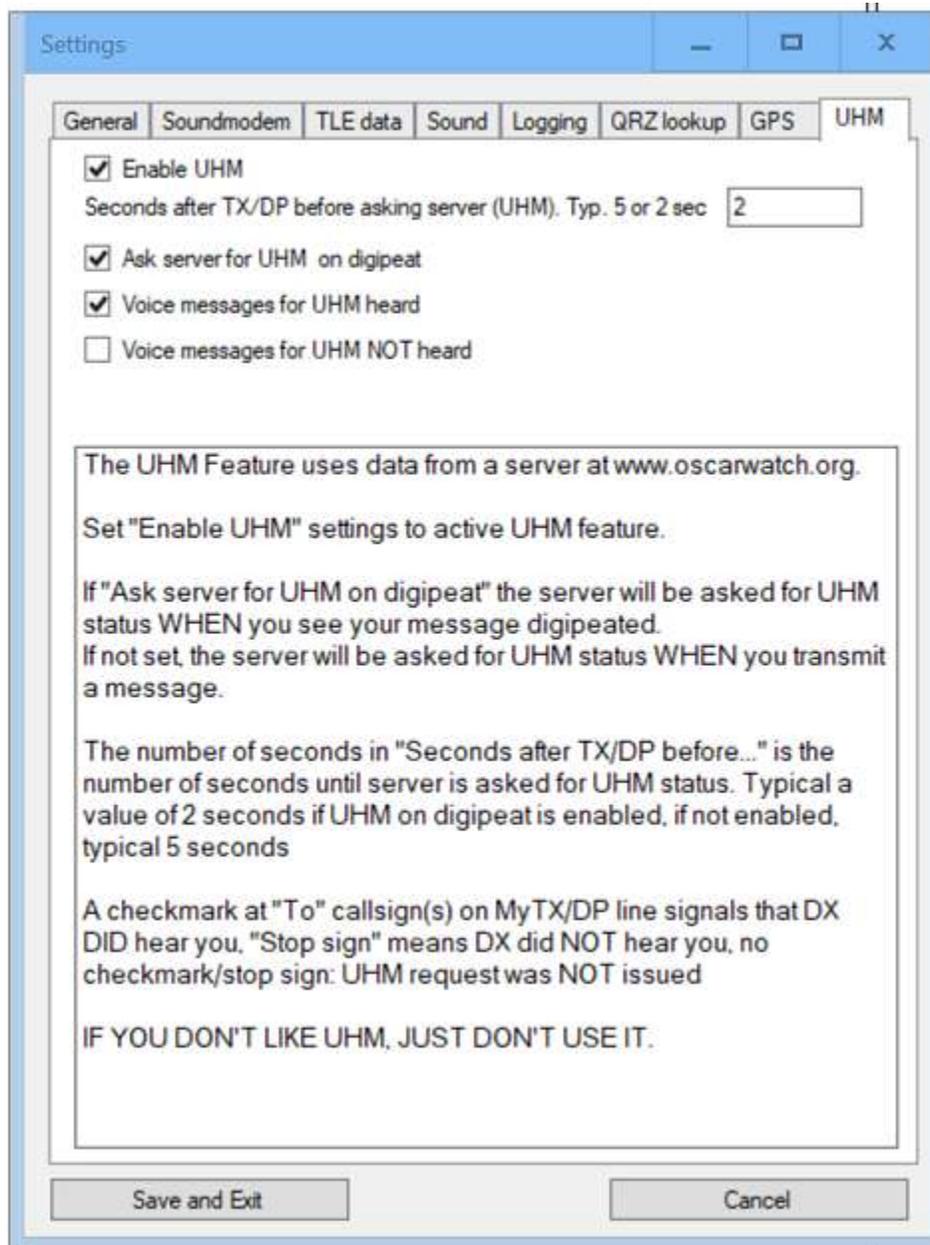
Whether or not you enable sound alerts is a personal choice but can be very helpful. Stations without internet access are considered non-UHM participants. For those not interested in the added benefit UHM provides you, for whatever your reason, then the whole process can be disabled by leaving the "Enable UHM" function unchecked.

SYMBOLS UTILIZED WHEN USING UHM

For the purposes of this document a **Successful Transmission** will be considered any transmission you send that is digipeated by the transponder that returns to your Traffic Window.

The Check Mark

A check mark will be present beside the call sign of the station you are calling after you have sent a successful transmission that was digipeated through the satellite transponder and that GTC-T has determined was actually received by the station you are calling.

The Stop Sign

A stop sign will be present by the call sign of the station you are calling when GC-T determines that the station did not copy your successfully digipeated transmission.

No Symbol

When you call a station not participating in UHM then no symbol will appear by their call sign after GC-T has determined that they are a non-UHM participant. Whether or not they received you transmission will not be available using UHM.

The Question Mark

When you send a successful final 73 transmission to a non-UHM station then a question mark will show up in the S73 column of the CallingMe window. This will let you know that you have successfully sent your final transmission to complete the QSO but there will be no GC-T confirmation that the station actually received that transmission.

WITH UHM DISABLED

With UHM disabled NO Symbols will appear in the Traffic Window. Checkmarks will appear in the CallingMe window with a successful 73 transmission from you and a successful 73 reception from your QSO partner

WHAT TO DO WHEN YOU GET A STOP SIGN AND WHAT DOES A STOP SIGN REALLY MEAN?

A STOP SIGN AFTER A SUCCESSFUL TRANSMISSION MEANS THAT THE STATION YOU ARE CALLING DID NOT COPY YOU.

YOUR NEXT MOVE SHOULD NOT BE TO IMMEDIATLEY START TRANSMITTING AGAIN!!

CONSIDER WHY THE STATION DID NOT COPY YOU. YOU MUST ASSUME THAT IT'S BECAUSE THE STATION IS TRYING TO TRANSMIT TO FINISH A QSO OR CALLING SOMEONE THEY WANT TO CONTACT.

IF YOU JUST KEEP TRANSMITTING AND TRANSMITTING IT IS A LOSE-LOSE SITUATION FOR EVERYONE!

WHEN YOU GET A STOP SIGN ASSUME THEY ARE TRANSMITTING AND EITHER WAIT AWHILE TO RE-TRANSMIT OR BETTER YET WAIT UNTIL YOU SEE THEIR CALL AGAIN AT WHICH POINT YOU KNOW THEY WILL BE LISTENING AGAIN.

A STOP SIGN IS VALUABLE INFORMATION TO HAVE BUT YOU MUST USE THE INFORMATION IT PROVIDES YOU WISELY.

WHAT UHM LOOKS LIKE IN THE TRAFFIC WINDOW OF GC-T

Single station successful digipeat: IK3ITB DID COPY the call and grid square

16:30:57	OZ9AAR	IK3ITB	JO45
16:31:05	OZ9AAR	IK3ITB	JO45
16:31:12	OZ9AAR	IK3ITB	JO45
16:31:15	OZ9AAR	IK3ITB✔	JO45

Single station successful digipeat: IK3ITB DID NOT COPY the R73

16:38:21	OZ9AAR	IK3ITB	R73
16:38:24	OZ9AAR	IK3ITB⊘	R73

MultiCall successful digipeat: FG8OJ DID COPY the call and KP3V DID NOT COPY the call

15:42:11	KI0KB	FG8OJ KP3V	Testing
15:42:14	KI0KB	FG8OJ✔ KP3V⊘	Testing

MultiCall successful digipeat: HR1JBR has **NO SYMBOL** so therefore **NO TELEMETRY** is being sent by his station so we don't know if he copied the transmission or not, just like it has always been in the past before UHM. Both LU5FF and W3TI did copy the transmission.

| 15:48:50 | KI0KB | HR1JBR LU5FF W3TI | Testing Only |
| 15:48:53 | KI0KB | HR1JBR LU5FF✔ W3TI✔ | Testing Only |

As a result of my transmission I did get a call from LU5FF. You can see that my RR73 was successfully digipeated to him which he did copy as you see from the check mark next to his call on the last blue line.

15:48:50	KI0KB	HR1JBR LU5FF W3TI	Testing Only
15:48:53	KI0KB	HR1JBR LU5FF✔ W3TI✔	Testing Only
15:48:54	GreenCube	ALL	[TLM: eps/obc/radio bo
15:48:58	N7CMJ	CQ	DN28 Montana
15:49:01	AK3Y	W3TI	R73 TU!
15:49:12	W3TI	AK3Y	RR73 Logged TU
15:49:14	LU5FF	KI0KB	R73
15:49:22	N9ZTS	N8XHF	R QSL TU73
15:49:33	LU4FTA	N7CMJ	FF96
15:49:35	KI0KB	LU5FF	RR73
15:49:37	KI0KB	LU5FF✔	RR73

<u>UHM AND THE GC-T CALLING ME WINDOW</u>

The CallingMe Window is a reflection of what comes across in the Traffic Window but **only for stations that are calling you** with any transmission.

This window will let you know at a glance where you are in the process of completing a QSO with a station.

The CallingMe window is a very useful place to operate from when you are handling more than just a call or two. It's the place to be for Rovers and Wanted DX.

The S73 column shows a <u>Check Mark</u> when you have sent a successful 73 by RF packet transmission that was received by that station. It will show a <u>Stop Sign</u> if they did not copy your successful transmission. It will have a <u>Question Mark</u> if they are a non-UHM station.

The R73 column with show a Check Mark when you have received a successful RF packet '73' transmission

CALLING ME WINDOW EXAMPLES

COMPLETED QSO WITH UHM USER

In this example the station QSO is complete except for logging the contact. A successful S73 and a R73 with a time stamp indicating when the 73 you received arrived. This contact has not yet been logged. When logged, the call will disappear from the CallingMe Window. It will be logged with the time stamp time no matter how long you wait to log it.

The checkmark by the call sign indicates that the station is using telemetry and indeed received all your transmissions and the QSO is complete.

Call	Grid	Ele	LOS	S73	R73	Logd
W6CZ ✔	DM07	54.7°	00:44:50	✔	19:53 ✔	

COMPLETED QSO WITH NON-UHM USER

In this example below the station is not using UHM which is identified by No Symbol next to his call. You did receive a 73 transmission from him indicated by the R73 column checkmark at 17:45 UTC. You did get off a successful 73 transmission to him indicated by the question mark present. This also indicates that the other station is a non-UHM user. Since GC-T is unable to confirm he copied your transmission the question mark remains.

Call	Grid	Ele	LOS	S73	R73	Logd
AA2HJ	CM97	12.8°	01:08:39	?	17:47 ✔	

If you receive another transmission from a station you have already logged and it ends up back in your CallingMe Window you will then see a checkmark in the Logd column. This most likely will happen with a station that did not copy your 73 report and sent you a repeat grid transmission. In that case you can review the message in the Traffic window and then decide if they need another 73 transmission sent. If you decide no further action is needed you can delete the call from the CallingMe window.

INCOMPLETE QSO WITH A UHM USER

In the example below a 73 has been received at 20:45 UTC. A successful digipeat was sent but the station did not receive it as indicated by the Stop Sign symbol in both the S73 and by the Call sign. This tells you that you should send another 73 report to complete the QSO

Call	Grid	Ele	LOS	S73	R73	Logd
KI0KB🚫	DN70	0,5°	00:00:26	🚫	20:45✔	

INCOMPLETE MULTICALL QSOs WITH UHM USERS

In this example below you have received a 73 transmission from two stations. You have sent a 73 transmission to IK3ITB but they did not copy it as noted by the Stop Sign symbol in the S73 column and next to their call. 2M0SQL has not been sent a 73 transmission yet since the S73 column is empty. Both stations were subsequently included in a MultiCall transmission and sent a 73 transmission.

Call	Grid	Ele	LOS	S73	R73	Logd
2M0SOL	IO87	55,9°	00:47:24		16:38✔	
IK3ITB 🚫	JN55	32,0°	00:56:40		🚫 16:38✔	

COMPLETE MULTICALL QSOs WITH UHM USERS

In this example below two stations have now completed QSOs in the CallingMe Window waiting to be logged. Their timestamp is at the same time because both stations 73 transmissions were received almost simultaneously All the necessary components of the QSOs are checked and the checks by the call signs indicates the all three stations (you and them) involved have actually received all the necessary transmissions to complete the contacts. They can now be logged and will disappear from the CallingMe window.

Call	Grid	Ele	LOS	S73	R73	Logd
2M0SQL ✔	IO87	57,4°	00:46:38	✔	16:39 ✔	
IK3ITB ✔	JN55	33,3°	00:55:54	✔	16:39 ✔	

Calls can be logged individually or in groups by highlighting the call or calls to log and right clicking in the CallingMe Window over the highlighted calls and then selecting the logging option.

FOR ROVERS

If you are a rover and have internet access available you will find UHM a powerful tool if you decide to use it. **If you do not have internet access available then disable UHM in the menu**. In that case your CallingMe window after completing a QSO will appear as below. The standard checkmarks will be utilized in the S73 and R73 columns which will still be a powerful tool in keeping track of multiple QSO at once, particularly when using the MultiCall feature of the GC-T program.

COMPLETED QSO WITH UHM DISABLED

Call	Grid	Ele	LOS	S73	R73	Logd
W0GJ	EN43	54.2°	00:33:10	✔	18:35 ✔	

In closing, this whole process has been created in an attempt to add a little touch of sanity to what can be a frustratingly insane experience on a crowded IO-117 pass. Will it work? The more people using UHM the better the chances of that happening.