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KST4Contest/PraktiKST - user manual



http://www.on4kst.com/	
KST4Contest (praktiKST)	
OndependenceDesigned to enhance station workflow in contests:Prequency extractionDirected-to-you highlighting Default-text-macrosMany filters for the userlist Shows also misdirected messagesBy po5AMF	
ANY KEY	



1) Abstract

The ON4KST-Chat is the defacto-standard for skeds at the 144+ bands.

KST4Contest is a java based client for the ON4KST chat.

I specially designed it in a way at which it can improve the workflow of an amateur radio station during the contest, using the ON4KST Chat.

In the beginning I implemented the software because the chat is really useful if you know, which of the other station you worked before. We (DM5M) using UCXLog-software of DL7UCX and sure, you could use the chat and check the log manually for the worked-state of a selected callsign and then try to handle a sked (or not).

If there are 300 to 600 chatters active, that had been a huge amount of extra work for the second op at our station and it's annoying and slow to use.

So we needed an opportunity to mark the already worked chat stations.

That leads me to implementing a client which can handle that. Now, some time later, there had been more and more possibilities to improve the effectivity while using the chat.

2) About me

My name is Marc Fröhlich, Callsign DO5AMF and I am operator at DM5M. Many parts of the VUSHF part of the stations are results of reflections I done and worked out with the team of DM5M, mostly with DL5ASG and DL5ZK.

My passion: the upper bands. I am also qrv in some short wave contests, prefered is WAG.

The chance to work my callsign is rare as I had been qrv in contests only (95% of the time) as DM5M since ~2005.

a) Contact me

If you want to tell me something, you can write an email to

praktimarc+kst4contest@gmail.com

Please use only this address in the context of kst4contest as my other inboxes are full of trash...



3) Prerequisites

a) Behavioral etiquette

At the ON4KST chat the official language is **english**. Please use only english, even if you are communicating to other chatters of your own country.

It's common to use HAM abbreviations such as "agn, dir, pse" to communicate. It is best if you know some of the meanings of these abbreviations, this will make it easier for you to use the chat.

b) Account at ON4KST chat

In order to use the chat client you must be registred at the on4kst chat service. If you don't hatve an account yet, create one here:

http://www.on4kst.info/chat/register.php

c) Writing personal messages to other stations

Use "/CQ «CALLSIGN» «messageText»" to send a text direct to this callsign! Otherwise the message will be posted in the public channel and the adressed station most likely will never get this message due to many text-traffic in contests (5-6 messages per second!) except they also uses Kst4contest because I catch such messages and sorting it to the pm table.



4) Downloading the software

a) Download URL

The Software can be downloaded as a ZIP file here: <u>https://do5amf.funkerportal.de/</u>

The filename of the software is something like: "kst4Contest_v11.zip" (or higher).

b) Updates for kst4Contest

DO5ALF, the webmaster of <u>www.funkerportal.de</u> made it possible for me to upload my software packages there.

Thank you very much, Andreas!

I implemented a simple update information service:

If I am uploading a new version, the older version will show a window with the information that a new version is available (also a changelog) and also will show you the download link for the latest package.

To update, there is only one way at this time. Delete the old folder and unzip the new one.

Update information	-	-	\times
Update aviable!			
Your Software version:	kst4Contest 1.0		
Newest Software version:	kst4Contest 1.1		
Major Changes:	Chatter directed-to-you marking, New station marking		
Admin Message:	Please check the new abilities		
Downloadable here:	Download here		
 ChangeLog 			
▼ 1.1			
Date: 2024-03			
Desc: Increased wo	orkflow		
Added: - reachable warnin If a message-sende directed to this rec likely in my directic prefs at antenna-bu Otherwise it will be	g function: er writes another chatter to ask for a sked, I assume that his antenna is eiver-chatter. If this causes that the sender-antenna is directed most on (with a difference of +/-25deg [depends to what you entering in the andwidth]), this sender callsign will appear fat and green in the userlist. e normal formatted.		
As the senders ofte already), there is a	en propagates his frequency at the chat (that means, we have saved this high probability to work him at this short term opportunity.	1	
- Introduced new v	variables "FIRSTAP" and "SECONDAP" to the predefined texts		
If Airscout commune this variables.	nication is activated, you can add the AP Info to the snippet by using		
For example add th	nis text to your textsnippets or textbuttons:		
"There will be FIRS"	TAP. SECONDAP" will be converted to:		
"There will be a ver	ar did we in thimin. Nevt bid AP in 8 min-		

Example update window



5) Running the client, change some preferences

After running the praktiKST.exe there will be opening some window. The most important is your best friend: the settings window.

Station × Log sync	n TRX synch	Airscout	Notification	Shortcuts	Beacon	Unworkedstn requester	Workedstn database		
		Set you	r Login Creder	ntials and Sta	ation Para	meters here			
Login-Callsign:	DO5AM	F							
Login-Password:	•••••	••							
Name in Chat:	Marc								
Locator in Chat:	JN49GL								
Chatcategory:			-						
Antenna beamwidth	: 50.0								
Default maximum C	RB: 900.0								
Default filter QTF:	180.0								
!	! ! ! Don't forg	et to reset t	the worked sta	tions inform	ation befo	ore starting a new contest			
 I !!! Don't forget to reset the worked stations information before starting a new contest !!!! Define on which bands you will be qrv today (changes UI a bit click save, then restart!) My station uses 2m band My station uses 70cm band My station uses 23cm band My station uses 13cm band My station uses 9cm band My station uses 6cm band My station uses 3cm band 									

The most of the data to be entered at the station settings are obvious, even without reading this manual. Thatswhy I will only mention the important ones.

Please do not enter fantasy values at the fields: locator, antenna beamwidth and default maxium QRB! The Reason follows now.

The "my station uses band" checkboxes will affect the user interface. If you check only the bands where you are qrv (in many cases that will be only 2 or 3 bands), the user interface will only show you table rows and buttons which are neccessary for your activated bands.

If you changed one or mote of these checkboxes, you have to save and restart the software to see a changing effect.



a) Problems at running chat

1) Norton 360

praktiKST.exe is rated dangerous by Norton360 (tnx for reporting, Franz, PE0WGA). You will have to make an exception for this to use the Chatsoftware.



b) Station settings

Now let's continue to the settings which you have to make.

1) Antenna beamwidth

Please enter a real value here as this value is used for some calculations in the background of the software. The Software is able to highlight skeds in your own direction and this calculation is only useful if the data are plausible.

Please find more information here: 7)a), Sked directed to me"-Highlighting.

2) Default maximum QRB

As the Highlighting of skedders to you should only be done for distances which are workable for you, please enter a distance which is realistic for your station. A good value for us as DM5M is 900 kilometres.



c) Log synch settings

In general there are two possibilities to tag logged stations automatically as worked at the userlist of the chat.

TRX synch	Airscout	Notification	Shortcuts	Beacon	Unworkedstn requester	Workedstn database			
File polling for worked colleges									
File polling for worked callsigns									
Worked stations will be read there: SimpleLogFile.txt Choose									
N1MM/QARTEST/UCXLog/DXLog.net Network-Listener									
ork based UE	P log mes	sages 🗸							
listener (de	ault is 120	60) 12	060						
	TRX synch File d callsign Int e read there: MM/QARTES ork based UE -listener (def	TRX synch Airscout File polling for d callsign Interpreter (n e read there: IM/QARTEST/UCXLog, rk based UDP log mess listener (default is 120	TRX synch Airscout Notification File polling for worked callsig d callsign Interpreter (readOnly!) v e read there: Sim MM/QARTEST/UCXLog/DXLog.net Ne rk based UDP log messages v listener (default is 12060) 12	TRX synch Airscout Notification Shortcuts File polling for worked callsigns d callsign Interpreter (readOnly!) ✓ e read there: SimpleLogFile.to MM/QARTEST/UCXLog/DXLog.net Network-Lister rk based UDP log messages Jistener (default is 12060)	TRX synch Airscout Notification Shortcuts Beacon File polling for worked callsigns d callsign Interpreter (readOnly!) e read there: SimpleLogFile.txt MM/QARTEST/UCXLog/DXLog.net Network-Listener rk based UDP log messages listener (default is 12060) 12060	TRX synch Airscout Notification Shortcuts Beacon Unworkedstn requester File polling for worked callsigns			

1) Universal file based callsign interpreter (Simplelogfile)

As earlier 2022 I had to interprete UCXLogs binary database files without any knowledge of the format, I had to find out what's possible to reach my goals.

I took notice of readable String values in the binary files. I wrote a regular expression for matching callsign patterns. With this I am able to find out callsign-like patterns out of huge amounts of text while the callsign-matcher ignores the binary data and other Strings.

If you change the path of the logfile in the preferences, you are able to use all other logfile formats. The interpreter will recognize all callsign-formatted text-strings and mark worked stations in the chat clients GUI.

But in this case there is no option to mark a worked band for the station!

The better option is to use a compatible logprogram like UCXlog or N1MM to mark the worked stations with their worked bands.

2) Networklistener for loggers' QSO-UDP-broadcast

Thats important, read that!

In order to use station-worked tagging, kst4Contest must be executed parallel to the log-software!

The reason is that the log software will send an UDP packet to the broadcast address of your home network just at the moment you saves the QSO to the log programs database.

Kst4Contest catches these packets and will mark the station (potencial "chat-member") as worked in it's own internal sqlite database. **That means, kst4contest is not connected to the log programs database but rather get's the information which the log program shares**.

That means, if you log a qso and the chatclient is not running, there will be no chance for the chatclient to recognize that a qso had been saved – in the most cases!

Exceptional: **QARTest is able to send a full log to the client while UCXLog is not.** Just push the right button in the preferences of QARTest.

The udp port is likely the same as default (12060) if you never changed it. If you changed it, you had a reason fo that and knows the right port value to write in the field.

Note that if you running 2 log program instances for 2 radios at 2 computers but only one kst4contest chat for both bands, **both log programs have to propagate the qso packets to the kst4contest instance! Then at least one IP is not 127.0.0.1 (localhost).**

At DM5M we have this setup. If you are running 2 log programs at 2 pcs each one with an instance of kst4contest, then only the localhost have to consume the qso packets.

Eigene Station		
Allgemeines Transceiver Andere Schnittstellen Spezielles Farb	en / QSL Band-Plan Band	Data LPT
DX-Cluster über TNC via COM port COM y Port-Enstell. Telnet 1 Telnet 3 Telnet 2 Telnet 4 Web Browser CPU-Last UcxLog Network CPU-Last Tarkt file (xxX) <fexther th="" the="" to="" top="" top<="" true=""><th>CW / SSB Soundkarte D: Input 0 0 Mikrofon (USB Audio CODEC) Output 0 0 Lautsprecher (USB Audio CODEC)</th><th>RTTY / PSK / Digital □ Fldigi OSY Warten Pfad □ CW 2000 ⊕ Hz 2 ⊕ s □ ▼ PSKCore Soundkart(¬_1 ▲ In: Microsoft Soundmapper</th></fexther>	CW / SSB Soundkarte D: Input 0 0 Mikrofon (USB Audio CODEC) Output 0 0 Lautsprecher (USB Audio CODEC)	RTTY / PSK / Digital □ Fldigi OSY Warten Pfad □ CW 2000 ⊕ Hz 2 ⊕ s □ ▼ PSKCore Soundkart(¬_1 ▲ In: Microsoft Soundmapper
Zusatz Cat-I/O (PA/Tuner/) COM v Port Settings COM v Port-Enstell.	Pegel CW Ton 800 Hz Sende CW als SSB-Audio-Ton	Image: Construct Microsoft Soundmapper Image: Construct Mi
Winkey Winkey 9600 Bd No Rotor Image: Common state Port.Einstell Image: Common state Port.Einstell COM Image: Common state Port.Einstell Key mode Iambic B Image: Common state) ar	TX Mode SSB C Data/Pkt ICOM mode PSK C Klein C USB
Sende UDP P Port Radio Info: 127.0.0.1 12060 Spot Data: 12060 12060 Log QSO: 127.0.0.1 12060	puter which is runni at runs at the same o 7.0.0.1 (localhost-ac	ing kst4Contest computer: dress)
Port 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 DM data - - T -	18 19 20 Benutzt von U	Belegt von anderen JcxLog für Cluster W WinKey R Botor

A) Needed preferences for UCXLog

Note the green highlighted fields! Fill in the IP of the kst4contest computer (most likely localhost)



B) Needed preferences for QARTest

	Indirizzo IP	Porta	Default	
C Score	127.0.0.1	12060	Def.	Ogni 3 min
	127.0.0.1	12060	Def.	Invia log completo
₽ Radio info	127.0.0.1	12060	Def.	1
F" Spot	127.0.0.1	12060	Def.	J
┌─ Invia dati QSD a	ad HRDLog.net			
User	Codice	Inxi	a log con	npleto

"Invia log completo" will send the full QARTest log database to the chatclient. **Buona funzionalità** caro IK3QAR!

C) Needed preferences for N1MM

I have to take a picture of that sometimes...

D) Needed preferences for DXLog.net

Live score UDP broadcast IP address: Port: Port:	Default
DXC spots UDP broadcast IP address: Port:	Default
Radio UDP broadcast IP address: 127.0.0.1 Port: 12060	Default
Direction UDP broadcast IP address: Port:	Default
QSOS UDP broadcast IP address: 127.0.0.1 Port: 12060	Default
UDP broadcast listener IP address: Port: Port:	Default

Note the green highlighted fields! Fill in the IP of the kst4contest computer (most likely localhost)



d) TRX-synch settings

The trx synch option is also based to UDP packets of the log program, as the qso log synch option is. UCXLog and other programs are transmitting the actual frequency setting of the trx so the chat client and it will process this information, too.

By using ths option, you are able to propagate your qrg in the chat within a very short time and also via the automatic cq beacon. Just hit the macro key for the MYQRG or clicking the button and you never have to type your qrg again if someone asks for it.

/SETNAME MYQRG MYQRG

MYQRG Buttos

Note that if you running 2 log instances for 2 radios at 2 computers but only one instance of kst4Contest (in DM5M case an additional pc), only one logprogram instance should propagate the frequency packets to the network, the other sould not.

Kst4contest dont distinguish between the sources of these packets and processes everyone!

At DM5M we have this setup and I only propagate VHF qrg. It's the better option to use 2 instances of kst4Contest at 2 seperate computers/logs and 2 logins then...

e) Airscout settings

Airscout allows to easy detect airplanes for the signal propagation via aircraft scatter. It allows to communicate with it via an UDP interface which kst4Contest does. If you don't used airscout before, now it's time to do so!

Air scatter allows very far communication at VHF and up even for stations with low asl levels and bad topografic conditions. Thanks to **DL2ALF** all stations can use this great opportunity!

1) Airscout Download

Download here:

http://airscout.eu/index.php/download

2) Plane feeds (ADSB)

As the free usable plane feeds at the internet are unreliable and don't allow much traffic for the airplan data download (number of queries is mostly very limited), we all are very glad about the plane feed service established by **OV3T** (Thomas).

You need an account for his service. Don't forget to donate for this great service as the server costs for him are also not for free.



Get your account information here:

• <u>https://airscatter.dk/</u>

or here:

• https://www.facebook.com/groups/825093981868542

3) Plane feed setup

If you got your account by Thomas, next step is to setup it at the AS client.

Step1:	🖳 Air Scout Options – 🗆 X
	Spectrum Track CAT Watchlist Misc. Info General Database Stations Map GLOBE SRTM3 SRTM1 ASTER3 ASTER1 Path Planes Alarm Network
	Plane Feeds
	Plane Feed 1: [WebFeed] VRS Web Server v Settings Import Export Default
	Dinn End 2: Forma 1 Sattine lemnet Evenet Refault
Step2:	Air Scout Options - 🗆 🗙
1	[WebFeed] VRS Web Server
	Settings Info
	Web feed from Virtual Radar Server
	V Web Feed (c) AirScout (www.airscout.eu)
	SaveToFile False
	URL http://arscatter.dk:8890/VirtualRad Gets either single or aggrated feed
	Password •••••• Be sure to select the desired feed as
	UseGeoAt True the default web server feed in the
	Timeout 60 VRS Web server settings.
	WRIZ http://airscatter.dudez.no.18080/Vir
	Username2 do5amf for details.
	Password2 ·····
	LoadShare True Change hostname and/or port to your needs when getting data from a remote server.
	If the access is restricted, you can enter username and password here.
	Version
	Share load between both redundant servers 1.4.5.0



4) Setup for communication with kst4Contest

If there is no need to differ of the default values, then you should not do that.

There have to be only one checkbox enabled for turning on kst4contest ↔ AirScout communication:

🚽 Air Scout Options		- o ×
Spectrum Track CAT Watchlist Misc. General Database Stations Map GLO	Info SRTM3 SRTM1 ASTER3 ASTER1 Path Planes	s Alarm Network
Activate Server Activate Network Server AirScout can work as a server in a net UDP Server: You can ask for a path calculation bet portential for a reflection. HTTP Server: You can ask for latest plane positions JSON file which can used to run own See documentation for further details	ork. een two stations and AirScout will return the planes ne ia simple http-request (e.g. from a web browser. The re arvices and calculations.	er path and their soult is delivered as a
UDP Server Settings AirScout UDP Server Name: AS AirScout UDP Server Port: 9872	HTTP Server Settings AirScout HTTP Server Port: 9880	
CAUTION: Running a web serv function only inside a private n Depending on your user profile first run. Please accept all sec Otherwise the web service will	e is a potential security hole! You should a work. you will prompted several times by the Ope ity queries with "Yes" or "Accept". ot run properly.	rating System on OK Cancel

5) Resulting userlist behaviour in kst4Contest

After setting up all (and after connecting to a chat), the AP column will show up to two reflectable airplanes from your locator to each chatters locator. For enhanced workflow, the

Callsign 🗍	Name	QRA	QTF	QRG	Act	AP [minutes / pot%]
(DF9QX)	Matthias	JO42HD	1.1°		0	0 (100%) / 0 (100%)
(F1NZC)	Jean-Louis J	JN15MR	226.74°		0	nil
(F5DYD)	Jean-Louis	JN03KG	223.27°		0	14 (50%) / 31 (50%)
(F6DKW)	Maurice	JN18CS	262.71°		0	0 (100%) / 1 (75%)

private chat messages window do also provide this information, the data fields are the same then.

Let's look for example to DF9QX:

- 2 planes available
 - one in 0 minutes, another one in 0 minutes
 - both with 100% potencial (good height and distance, big planes)

As this is a bad example, let's use F5DYD:

- 2 planes available
- one in 14 minutes, another one in 31 minutes
- both with 50% potencial (not very big) but also maybe reflectable



6) Using AP Text-Shortcuts

If there is an airplane available, the Strings FIRSTAP and SECONDAP will be replaced with reflectable airplane data. Have a look to: 7)c)1)A) FIRSTAP, .

f) Notification settings

You can choose between up to 3 notification types here. First are simple sounds, such as a TADA sound for incoming messages, tick sound for sked-direction-detection, etc.

Station	Log synch	TRX synch	Airscout	Notification $ imes$	Shortcuts	Be			
	Notification settings								
Enable	audio notifi	cations at: sta	artup, new	personal message	es, other 🗸]			
Enable	CW callsign	spelling for i	new persor	al messages	\checkmark]			
Enable phonetic callsign spelling for new personal messages									

Second type is that the callsign of a station which

writes a personal message to you will be typed as an audio cw signal out of your speaker.

Last type is a phonetic spelling of the callsign of a station which writes a personal message to you.

g) Shortcut settings

Here you can change or add fast accessible text-buttons which are generated live. I created some as default but most likely you need other ones. Also longer texts are possible. The texts will be added to the UI. A click to each button will insert the text of the button to the sendtext-field, where you are typing your texts normally. It's also possible to use all variables. The variables will be

tation	Log synch	TRX synch	Airscout	Notification	Shortcuts X	Beacon	Unworkedstn requester	Wo
			Set the sho	ortcut-Buttons	above Sendte	xt-field)		
Short	tcut-Buttont	text						
Hi ON	Л,							
pse								
turn								
ant								
my								
dir								
sked								
ssb								
cw								
trv								\sim
Add	new shorcut-	-button m	ove marked	d down mo	ve marked up			

changed to real values if you use it there (and also if you type it by hand).

1) Resulting UI behaviour

Hi ON	1, pse	e 🗍 turn	ant	my	dir	sked	ssb	cw	try	agn	nw	qrg	bean	ning	calling	Isn to	qsb	rpt	nr	ur	I
hear	you	weak	nil, sry	ma	ybe	later	tmw	rrr	tnx	qso	73	?!) ,	/SETN	AME MY						
														se	end	clear		144.	388.0	3	

Each shortcut text will create exact one button



h) Snippet settings

The textsnippet-function is very similar to the shotcut buttons.

The snippets which you creating here are accessible via

- ٠ right klick to a callsign in the userlist,
- right click in the cq-message table, •
- right click in the pm-message table ٠ and

Snippet	
Hi OM, try sked 2m? Ur QRG?	
Hi OM, try sked 70cms? Ur QRG?	
I am calling cq to ur dir, pse Isn to MYLOCATOR at MYQRG	
There will be FIRSTAP. SECONDAP	
rrr, I move to your qrg nw, pse ant dir MYLOCATOR	
pse ant dir MYLOCATOR	
I turn my ant to you now	
Sry, strong qrm by local station, may try MYQRG	
Sry, in qso nw, pse qrx, I will meep you	

Set the Text-snippets (First 10 are accessible by pressing <strg> + <nr>!)

the first 10 snippets are linked to the button combination ctrl+1, ctrl+2, [...], ctrl+0! •

Ur ant my dir MYLOCATOR nw?

Add new snippet move marked down move marked up

I had this idea from Gianluca Costantino, read more here: 7)c) Macros.

1) Resulting UI behaviour (right click)

(DF9QX)	Matthias	J		100%) / 2 (75%).
(F1NZC)	Jean-Louis J	J	HI OM, try sked 2m? Ur QKG?	
(F5DYD)	Jean-Louis	J	Hi OM, try sked 70cms? Ur QRG?	50%) / 11 (50%)
(F6DKW)	Maurice	J	I am calling cq to ur dir, pse Isn to MYLOCATOR at MYQRG	75%) / 17 (75%)
(S52FO)	Janez	J	There will be FIRSTAP. SECONDAP	
(SM7SPG)	Per	J	rrr, I move to your qrg nw, pse ant dir MYLOCATOR	
DG2KBC	Ansgar MM	J	pse ant dir MYLOCATOR	100%) / 0 (100%
DH3NAN	Matthias	J	I turn my ant to you now	100%) / 0 (100%
DL1YDI	Dirk 2m/9Ele	J	Sry, strong qrm by local station, may try MYQRG	100%) / 5 (75%)
DO1CTL	Frank 2/70/	J	Sry, in qso nw, pse qrx, I will meep you	100%) / 0 (100%
F6HTJ)	Michel	J	Ur ant my dir MYLOCATOR nw?	50%) / 13 (50%)
6IFX	Bert 2/70/23	J	nil?	100%) / 8 (75%)
G4FUF	Keith	J	No cw op here, pse can we use ssb?	100%) / 0 (100%
G4TRA	Steve	10	No chance in ssh. can we use cw?	(75%) / 0 (50%)
G4URT	Peter 2m 4*	10	Nil till new are you calling?	
G4XYW	Andrew	10	Nit un now, are you caning:	100%) / 2 (75%)
GW0GEI	steve 2/6m	10	INII nere, thx try, maybe later!	
HA2NP	Robert	J	Nil, I will look for an ap and meep you then	
HA4XN	Zoli 2m SSB	J	There will be an AP in	
I3MEK)	Mario	J	Tnx fb qso, all ok, 73 es gl!	75%) / 3 (75%)



i) Beacon settings

Here you can activate an automated message in the public channel (message addressed to all). You can change the text and interval and also use some variables (7)c)1)Variables).



There is planned a new variable for own QTF

j) Worked station database settings

There is only one reason for this settings tab: to **reset the internal worked-state database before a contest (and since v1.2: reset the not-qrv-band-info)**. Planned feature is a lifetime for the worked state, then the reset can be automatized. Please use the button below the table to reinitialize the worked-DB before each new contest.

Station L	.og syn	ch	TRX	sync	h /	Airso	out	No	otificatio
		C	hang	ge th	e se	tting	s of t	the	internal
C -11-				١	worl	ked			
Calls	ign		1	4	23	13	9	6	3
ОК2КҮЈ									
SM5EPC	2								
DK0MM	1								
CT1DM	К								
HA5KFZ	2								
SP4MPE	3								
PC7M									
DL5AAJ									
F5AYE									
OK2KYZ	2								
OM0AT	U								
M1ABK									
PA1AW									
HA9MD	N/P								



k) Click save settings to store your personal settings!

This settings will be saved in the folder ".praktikst/preferences.xml" at your user folder.

Since version 1.21 your windows sizes (and divider positions) will also be saved via the savebutton.

6) Connecting to the chat

After selecting a chat category, you are able to press the connect button and connecting to a Chat. If Airscout is running and all preferences are ok, it should look like the following.

Time	Callsign	Name	QRA QRB	Message L	ast know AP [minutes / pot%]	Show only C	RB [km] <=	900.0 Hide:	Show only QT wkd 144 432	F: 135.0 di	eg, 50.0 beam	width N NE E S	εs	SW	W N	w				
						-										worked				
						Callsign 🕈	Name	QRA	QTF	QRG	Act	AP [minutes / pot%]	wkd	144	432	23 1	3 9	6	3	
						(DF9QX)	Matthias	JO42HD	1.17		58	0 (100%) / 0 (100%)								
						(F1NZC)	Jean-Louis J.	. JN15MR	226.74*		58	nil								
						(F6CIS)	144.010.00	IN94WL	233.02*		58	14 (75%) / 9 (50%)								
						(G4MKF)	Malcolm	IO91HJ	290.67*		58	21 (75%) / 0 (50%)								
			Kein Inhalt in Tabelle			(SK5AA)	Club VRK 4	TL68OL	21.48*		57	nil								
						DG2KBC	Ansgar MM.	JN58MI	123.46*		58	0 (100%) / 0 (100%)								
						DK6AS	Andreas	JOS2JJ	25.06*		31	0 (100%) / 0 (100%)								
						DL1YDI	Dirk 2m/9Ele	JO42FA	358.84*		58	0 (100%) / 2 (100%)								
						(DL68F)	Heinz 2 &a	JO32QI	346.1*		22	0 (100%) / 0 (100%)								
						EI9KP	Phil	IO54MB	299.67*		5	nil								
						F5ICN	Alex QRV 2	JN038F	226.02*		58									
						F6DKW	Maurice	JN18CS	262.71*		40	0 (100%) / 7 (75%)								
						Fegra	Carol 6/2/70	JN04DB	229.28*		3	23 (50%) / 24 (50%)								
IOM, pse	turn ant	my dir	sked ssb cw try agn nw qrg beam	ng calling Isn to qsb r	pt nr ur I hear you	GOJDL	John 2/70/23	JO02SI	305.77*		5	0 (100%) / 0 (100%)								
eak nil, sr	/ maybe is	ater tmw	rrr tnx qso 73 ? ! , VSETNAME MYC	RG MYQRG		G3MXH	Terry	JOO2LF	302.78*		19	0 (100%) / 0 (100%)								
on DI 686				send dear	44 209 02	G4DCV	Paul	IO910F	289.94*		58	24 (75%) / 0 (50%)								
						G4DHF	David	109200	304.75*		37	0 (100%) / 0 (100%)								
Time	Callsign	Name	Message		Last QRG	G4FUF	Keith	JO01GN	295.33*		58	0 (100%) / 1 (75%)								
.03 14:29	OHEMAZ	Hannu	ell=all			G4RGK	Dave 1296	1091NO	293.15*		58	0 (100%) / 7 (75%)								
.03 14:29	OHEMAZ	Hannu	Galei			G4URT	Peter 2m 4*.	. 1082PU	299.88*		58	nil								
.03 14:06:			giv tropo or ms			G4XYW	Andrew	109101	291.06*		58	17 (75%) / 21 (75%)								
.03 14:06:	DL6BF	Heinz 2 &a	.yes I			G8VHI	Reg 6 2 70	IO92FM	299.47*		58	0 (100%) / 25 (75%)								
103 14:04:	DL6BF	Heinz 2 &a	m l			GW0GEI	steve 2/6m	IO72VE	293.47*		58	nil								
.03 13:33:	SERVER	Sysop	Your name is now "Marc".			GW8ASD	Tony	IO83LB	300.76*		58									
.03 13:33:	SERVER	Sysop	Your QRA Locator is now "JN49GL".			HAZNP	Robert	JN975G	102.65*		58	nil								
.03 13:33:	SERVER	Sysop	Use the inline ON4KST-2 CLX DX cluster for your	spots.		13VJW	Walter	JN55MI	156.77*		8	1 (75%) / 2 (75%)								
.03 22:12:	IKSPWC	Luca Sezion.	. 2			Messages of D	6RE -> Filter	noth	ing 🔘 om to me	nm to ot	ther nubl	ic msos								
.03 22:12:	IKSPWC	Luca Sezion.	. 2			Time	Call TX	Call RX	ing O printe inc	O pin to o	ordi 🕘 poo	Message								
.03 20:29	OHEKTL	Lasse	so still some hours, then we know		483	24.03 14:10:02	OH6KTL	DL68F	rr here arey -0.5da	r no wind , and	about 5cm sr	ow on ground roads are c	aetina dr	v so its o	k.					
.03 20:28:	OHEKTL	Lasse	should be alert beginning Sunday evening and in	nto Monday.	483	24.03 14:08:20	DL6BF	OH6KTL	Lasse here bad WX	, time to time	rain, strong no	ise then from static rain a	nd temp	5 degr I						
.03 20:28:	OHEKTL	Lasse	Geomagnetic storming reaching the moderate (G	i2) to strong (G3) threshold	483	24.03 14:06:04	DL6BF	ALL	.ves l											
03 20:27:	OH6KTL	Lasse	CME Model Released: The halo CME has been mo	odeled. NOAA/SWPC is callin	483	24.03 14:05:16	OHEKTL	DL68F	been restaurating a	a room so lines	has to be cha	nged.								
03 20:27:	OH6KTL	Lasse	yes this came few hours ago on solarham.net b		483	24.03 14:04:18	DL6BF	ALL	m1											
.03 20:26:	NL8992	Anthonie P	RR, on Dutch news channel, they announced mo	nday would be best to view		24.03 14:03:02	OHEKTL	DL68F	but i got a pwr cut	on way here w	ill change a fe	eding line 5 x 2.5 mm2 to a	a ho spot	t wich is i	n use					
03 20:23:	OH6KTL	Lasse	so othing tonight2mrw and monday then		483	24.03 14:03:00	DL6BF	OH6KTL	rr Lasse , ol 1											
03 20:22:	OH6KTL	Lasse	and this is 240km west of me https://www.sm3e	sx.se/sam.htm	483															
			follow the Stiers, home page, https://itiaskelarce.	on wiveite.com/sm&noc	483	OT5-246.1 deg														
)3 20:20:	OH6KTL	Lasse	follow the bogs frome page intps//sogakelaiss	on the state of th		Girloworracy														

As you can see, my PM window in the upper left corner left empty during this test.

At the downer right side you can see the messages of/to a selected station. You are also able to filter which messages you want to see.

In this way you will have a very fast overview of what happened during the communication of this chatter.

Disconnect and reconnect is only available via the settings window.

Best practice is to leave the settings window open as if youre scanning frequencies for new qsos, you may should turn off the beacon sending.



There will be an additional "cluster & QSO of the others" window. There you can try to follow the qso flow between the other stations. As I don't do that ever, I am minimizing this window. This window is interesting only in the night hours of contests, if the traffic decreases. At this time it is unfiltered but later I will filter the messages of chatmembers, which are in your selected QTF (See 7)g)Direction filter for the userlist).



7) Features

a) "Sked directed to me"-Highlighting

One picture tells more than 1000 words. I painted one.

So let's begin with the picture and than let's follow 1000 words:



• Sked from F5FEN to DM5M

- DO5AMF in JN49 will get a sked-in-your-direction-tag for F5FEN in the userlist
- DO5AMF/P will get a sked-in-your-direction-tag for F5FEN in the userlist
- F/DL5ASG will **NOT** get a sked-in-your-direction-tag for F5FEN in the userlist
- Sked-answer from DM5M to F5FEN
 - DO5AMF in JN49 will get a sked-in-your-direction-tag for DM5M in the userlist
 - DO5AMF/P will **NOT** get a sked-in-your-direction-tag for DM5M in the userlist
 - F/DL5ASG will **NOT** get a sked-in-your-direction-tag for DM5M in the userlist
- F1DBN is unaffected by the communication



Following now: an explanation to the mechanics and the thoughts. It's simple and free of topographic path calculations although this would be possible. Maybe this will follow sometime.

If a message-sender writes another to ask for a sked, I assume that his antenna is directed to this receiver-chatter. If this causes that the sender-antenna is directed most likely in my direction (with a difference of «half of selected beamwidth»), the callsign will appear fat and green in the userlist. As the sender often propagates his frequency at the chat (that means, we have saved this already), there is a high probability to work him at this short term opportunity

At this moment, the calculation is based to the value of your own antenna beamwidth. I tested this with 50 deg (while DM5M uses only Quads with 69 deg). Test results had been good for 50 deg.

As you certainly use an antenna setup similar to the most of the other stations of the used bands, I am assuming that the other stations do nearly have the same antenna beamwidth as you are using. Maybe it would be good to decide between the others beamwidth and the own. But since I don't have any information about the antennas, I firstly have to find a good treshold for the warnings.

Show only	QRB [km] <=	900.0	Show only QT	F: 135.0 de	eg, 50.0 beamw	idth N NE E S	ES	SW	M N	1M		
Find		Hide: wkd	144 432	23 13	9 6 3	Inactive stations						
Callainn	Name	0.0.4	OT	0.00	00	AD (minutes (met0/)				work	ed	
Calisign	Name	QKA	QIF	QKG V	Act	AP [minutes / pot%]	wkd	144	432	23	13	9
(F1NZC)	Jean-Louis J	JN15MR	226.74°	n285	13	nil						
G1KAW	kevin	IO91RH	291.04°	320	18	5 (75%) / 9 (75%)						
9A1UN	Davor MMC	JN65TF	139.09°	310 320	39	0 (100%) / 1 (75%)						
YU7SMN	Nesha	KN05EG	113.25°	284	2	nil						
OK1FPR	Milos	JO80CE	78.93°	271 382 35	39	0 (100%) / 3 (75%)						
DD0VF	Steffen 2m	JO61TB	62.08°	182	47	0 (100%) / 0 (100%)						
DK5EW	Wini	JN48MB	166.72°	182	22	0 (100%) / 0 (100%)						
OE3FVU	Franz 4x14	JN78VE	102.39°	180	21	nil						
OH6KTL	Lasse	KP02OJ	23.64°	144180 315	25	nil						
G4KWQ	Andy 2x12ele	IO92AQ	299.96°	144095	10	nil						
EW7T	Anatoly	KO53DR	64.17°	144058	42	nil						
HB9SJV	Ben	JN36DO	208.46°	144.310	28	0 (100%) / 4 (75%)						
PA2DX	Kees	JO23XE	337.48°	144.180	14	0 (100%) / 0 (100%)						
OM4CW	Vlado 2m Q	JN88UN	95.19°	144.052	46	nil						
DL8KX	Tommy	JO53CL	13.9°	087	9	0 (100%) / 0 (100%)						
DG5CST	Sebastian70	JO60DS	60.32°	077	52	0 (100%) / 1 (75%)						
I3MEK	Mario	JN55SJ	152.46°	060 358	6	0 (100%) / 1 (75%)						
DK3EE	TOM	JO41GU	0.0°	060	51	0 (100%) / 0 (100%)						
(DF9QX)	Matthias	JO42HD	1.1°		21	0 (100%) / 0 (100%)						
(F6CIS)	144.010.00	IN94WL	233.02°		21	11 (75%) / 15 (75%)						
(G4MKF)	Malcolm	IO91HJ	290.67°		52	1 (50%) / 3 (50%)						

Example: green and fat means: station makes a sked in your direction



b) Airscout-interface

As described in the AirScout settings, kst4Contest is able to send messages to Airscout and it answers with a list of reflectable planes and their properties.

Note, if you running multiple instances of kst4Contest and this setting is turned on at both instances, Airscout will answer to both instances as well in the local network!

That's not a problem if the locator is the same for both instances (or/and if the login callsign differs from one instance to the other). Otherwise it will have bouncy effects to the available AP list and the AP data maybe are not valid.

c) Macros

There are some predefined Text-Snippets you seen before. In general you mostly does not need more than 4 or 5 predefined texts in the whole contest.

The first 10 texts are callable by hitting key-combinations: CTRL + 0 [....] CTRL + 9.



Gianluca Costantino gave me the idea of using a programmable macro keyboard and assigning the key combinations to the keys. By hitting a key, you can call the texts, hitting another key (linked to enter) will send the text.

This really saves a lot of time compared to the right click menu and significantly improves the workflow.

In the most cases, the macro calling will only make sense after you selected a receiver in the userlist. Kst4Contest will then address the user by typing:

"/CQ «callsignOfTheUser» «Makro»"

to the sendtext-field.

Hitting enter will then send this text, even if you the sendtext-field dont have the focus.



1) Variables

There are some built in variables which will be replaced by values at the runtime.

A) FIRSTAP,

Assuming (example):

- a plane to a selected station is available
- the plane have a potencial of 100%
- the plane is available for reflection in 1 minute

Typing "FIRSTAP" will causing this text for example: "a very big AP in 1 min"

B) SECONDAP

Assuming (example):

- a second plane to a selected station is available
- the plane have a potencial of 75%
- the plane is available for reflection in 9 minute

Typing "SECONDAP" will cause this text for example: "Next big AP in 9 min"

C) MYQRG

This will be replaced by the QRG Value which had been received of your log software, if you activated the TRX synch in the preferences or otherwise the entered value of the textfield "MYQRG" right of the send button. Format for QRG string (example, (autoupdating on)) would be: "144.388.03".

D) MYQRGSHORT

Same as MYQRG but only the first 7 characters will be used, for example: 144.388.

E) MYLOCATOR

This will be replaced by your maidenhead-locator (6 characters, for example "JO51IJ").

F) MYLOCATORSHORT

Same as MYLOCATOR but only the first 4 characters will be used, for example: "JO51"

G) QRZNAME

This will be replaced by the data in the name-field of a selected station.



H) MYQTF (planned for v 1.3)

This will be replaced by values for "north, north east, east, [....]". The value for that will be setted out of your beam direction in deg which you can enter at right-handed to the MYQRG-Field (MYQTF-Field).



d) Simplelogfile

As earlier I had to interprete UCXLogs binary database files without any knowledge of the format, I had to find out what's possible to reach my goals.

I took notice of readable String values in the binary files. I wrote a regular expression for matching callsign patterns. With this I am able to find out callsign-like patterns out of huge amounts of text while the callsign-matcher ignores the binary data and other Strings.

If you change the path of the logfile in the preferences, you are able to use all other logfile formats. The interpreter will recognize all callsign-formatted text-strings and mark worked stations in the chat clients GUI.

But in this case there is no option to mark a worked band for the station!

The better option is to use a compatible logprogram like UCXlog or N1MM to mark the worked stations with their worked bands.

Meanwhile I used the logfile in the program folder for tagging stations worked which are unworkable for me (they wrote something with this meaning by the chat, e.g. "I am not qrv today, just spying"). I will replace this method later by introducing reachable tags or something similar (I have to think about that.

The file will be handled as read-only. This way you could also use your production logfile.

e) Intervalled beacons

KST4Contest is able to propagate that you are QRV via messages to the public chat channel. It's able and recommended to insert your CQ frequency there. The best option for that is to use the MYQRG variable (7)c)1)Variables). You are able to update the MYQRG by log program then or also set it manually.

If someone other uses kst4contest in the chat channel, this station will instantly have your QRG on the screen beacause of the qrg reading.



f) QRG-reading

Kst4Contest processes each line of text which flows through the channel.

One of my first goals of the implementation was to build a cluster-like list where I can find out the CQ QRGs of calling stations without asking.

The result to the workflow is clearly that you can visit the QRGs short term and have a look (or throw an ear) if you might can work a station.

Together with the direction warnings it is a useful feature for working stations at good opportunities without really interrupting your CQ calling.

Show only Q	RB [km] <=	900.0	Show only QTF	: 135.0 de	g, 50.0 beamwi	dth N NE E SE	S
Find		Hide: wkd	144 432	23 13	9 6 3	Inactive stations	
Callsign	Name	QRA	QTF	QRG 🔻	Act	AP [minutes / pot%]	wkd
(F1NZC)	Jean-Louis J	JN15MR	226.74°	n285	9	nil	
G1KAW	kevin	IO91RH	291.04°	320	13	10 (75%) / 13 (75%)	
9A1UN	Davor MMC	JN65TF	139.09°	310 320	35	0 (100%) / 0 (100%)	
YU7SMN	Nesha	KN05EG	113.25°	284	2	nil	
OK1FPR	Milos	JO80CE	78.93°	271 382 35	34	2 (75%) / 2 (75%)	
DD0VF	Steffen 2m	JO61TB	62.08°	182	43	0 (100%) / 0 (100%)	
DK5EW	Wini	JN48MB	166.72°	182	18	0 (100%) / 5 (75%)	
OE3FVU	Franz 4x14	JN78VE	102.39°	180	16	nil	
OH6KTL	Lasse	KP02OJ	23.64°	144180 315	21	nil	
G4KWQ	Andy 2x12ele	IO92AQ	299.96°	144095	6	nil	
EW7T	Anatoly	KO53DR	64.17°	144058	38	nil	
HB9SJV	Ben	JN36DO	208.46°	144.310	24	1 (75%) / 5 (75%)	
PA2DX	Kees	JO23XE	337.48°	144.180	9	0 (100%) / 0 (100%)	
OM4CW	Vlado 2m Q	JN88UN	95.19°	144.052	42	nil	
DL8KX	Tommy	JO53CL	13.9°	087	5	0 (100%) / 0 (100%)	
DG5CST	Sebastian70	JO60DS	60.32°	077	48	0 (100%) / 0 (100%)	
I3MEK	Mario	JN55SJ	152.46°	060 358	2	0 (100%) / 0 (100%)	
DK3EE	ТОМ	JO41GU	0.0°	060	47	0 (100%) / 0 (100%)	

QRG-column will be filled with (likely) QRG-values



g) Direction filter for the userlist

If you call CQ contest in a direction it is maybe useful to ask for skeds in this direction. To make it easy finding stations in this direction, it's possible to show only callsigns in the userlist, which are positioned in a special direction. Just activate "Show only QTF" (fill in degrees or) use the N / NE / E [....] buttons to filter.

Show only C	QRB [km] <=	900.0	Show only QT	F: 135.0 de	g, 50.0 beamw	idth N NE E SI	ES	SW	W	W
Find		Hide: wkd	144 432	23 13	9 6 3	Inactive stations				
Callaina A	News	0.04	OT	0.00	0					wor
Calisign -	Name	QKA	QIF	QKG	Act	AP [minutes / pot//j	wkd	144	432	23
DJ9MG	Peter	JO52TC	35.41°		23	0 (100%) / 0 (100%)				
DK3EE	ТОМ	JO41GU	0.0°	060	45	0 (100%) / 0 (100%)				
DL1YDI	Dirk 2m/9Ele	JO42FA	358.84°		15	7 (75%) / 8 (75%)				

Direction filter is up to the userlist

h) distance filter for the userlist

As the most contesters knows their maximum reachable distance (average), it's possible to hide chatters which are farer than this distance. Have a look to the button "Show only qrb [km] <=". It's a toggle button. If you turn it on, the real dx stations will be hided..., :-).

i) worked-filter and NOT-QRV-filter for the userlist

By activating one or more of the hide-worked (also hide-NOT-QRV-tagged) togglebuttons (one per band), you can activate a filter to hide stations which are worked at a special band or tagged as NOT-QRV by yourself.

Show only C	QRB [km] <=	900.0	Show only Q	TF: 180.0	deg, 5().0 beamwidth	N	NE	E	S	SW	w	' N	W	
		Hide worked: Hide un-QRV	wkd 14	44 432 2	3 1	3 9 6	3 lı	nactive	station	IS					
Callsian 🔺	Name	OPA	OTE	OPC	Act	AD (minut				worl	ked				
cansign .	Name	QKA	QIF	QKG	ACL	AF (minut	144	432	23	13	9	6	3	wk	NOT QRV @
(9A4P)	Club	JN85UH	120.44°		21	nil									144
(F5DYD)	Jean-Louis	JN03KG	223.27°		20	nil									144 70
(G4MKF)	Malcolm	IO91HJ	290.67°		20	nil									144 70 SHF23 SHF13
(G8IQL)	Martin	IO90LX	287.4°		20	nil									144 70 SHF23 SHF13 SHF9

Example view for activated "worked-and-not-qrv-filter"

Read more about the filter function here: 7)k)Tagging other chatters as not-qrv.

j) Catching personal messages which aren't adressed correctly

As I wrote in the prequisites, to send a pm to another callsign, you have to type

"/CQ «callsign» «mesagetext»"

There are much chatters which sends messages to the public instead to a station. I don't know the reason for that, maybe because they does not know how to send personal messages or they make mistakes by unintentionally sending wrong formats.

I see things like

"(DM5M) pse ur qrg"

in the public chat at every contest and in every NAC (every tuesday).

If there is much traffic in the chat, the receiver never would be able to read those type of messages (except he is using kst4Contest). Thatswhy I decided to sort all messages which inhibits your own callsign to the personal messages table. That works really good and you never miss a message to you.

Also you are able to see if someone is slandering about you, hihi.

🔳 Conn	ected	to: 2: 14	4/432	2 MHz	as DO5	AMF (Marc)	in JN4	19GL	(129	users	onlir	ne, 129	shown), 3	332 mess	ages	total.								
File	Optio	ns W	indov	vs Ir	nfo																				
Time	е	Calls	ign	1	Name		QRA			QRB	3			N	lessage				Last	know	<i></i>	AP (minut	es /	pot%]
24.03 19:	41:	DM5M		Tean	n VUSH	IF JC	51IJ		262	km (3 4)°	test										4 (75	%) / 4	(759	6)
24.03 19:	41:	DM5M		Tean	n VUSH	IF JC	51IJ		262	km (3 4) °	(DO	5AMF)	test								4 (75	%) / 4	(759	6)
Hi OM,	pse	turn	ant	my	dir	sked	ssb	СМ	tr	y a	agn	nw	qrg	beamin	g callin	ng	lsn to	qsb	rpt	nr	ur		hear	yc	u
weak	nil, sr	y mayl	be	later	tmw	rrr	tnx	qso	73	?	!	, /	SETNA	ME MYQF	G MY	QRG									
															send		MYQR		144.	388.0	3				

Example, 1st entry: pm, 2nd entry: catched public message with "DO5AMF"-string inside

ST4Contes



k) Tagging other chatters as not-qrv

There are obvious signs of other stations that they are not qrv at special bands. To name an example, if we have a station "DM5D" in the chat and the name in the chat of this station is "23+ only", we can assume that DM5D is only qrv at 23cms, 13cms and may up. I got the hint that such a filter is neccessarry by Franz van Velzen, PE0WGA (tnx!).

However, there is a big amount of other stations which won't write such hints into the name field. You need to ask them for a sked at a band that you want to try. If you ask them for a sked at 144 MHz, they may will answer "sri, only 432 and 1240 today".

If there is an operator change at your station or you are just tired, your station will maybe ask DM5D several times for a sked at 144 MHz. While the HAM spirit asks us for patience, it's avoidable typing work for DM5D to repeat this asnwer all the time.

Thatswhy since v1.2 it's possible to tag a slected station as not qrv at each band, if you get this information:

Time	Call TX	Call RX		Message
				Kein Inhalt in Tabelle
QTF:287.4 deg QRB: 701 25 km		Show path	n in AS v tag not qrv 144	tag not qrv 9cm
QTF:287.4 deg QRB: 701.25 km Last activity: 14.0	04 20:27:35	Show path	h in AS v tag not qrv 144 v tag not qrv 432 v tag not qrv 23cm	tag not qrv 9cm tag not qrv 6cm tag not qrv 3cm

Show only C)RB [km] <=	900.0	Show only Q	۲F: 180.0 و	deg, 50	0.0 beamwidth	N	NE	E	S	SM	/ [W	' N	w	
g8iqI	g8iql Hide worked: wkd 144 432 23 13 9 6 3 Inactive stations														
		ORA	OTE	ORG	Act	AP (minut	worked							NOT ORV @	
Callsian 🔺	Name	ORA	OTE	ORG	Act	AP (minut				work	ked				NOT ORV @
Callsign 🛔	Name	QRA	QTF	QRG	Act	AP [minut	144	432	23	work 13	ked 9	6	3	wk	NOT QRV @

Sample view for using NOT-QRV-tags of G8IQL (unfiltered Userlist)

Of course, the band filters of the user list also affect the NON-QRV tags. If you activate a hide filter, stations that are not qrv on the filtered band will also be hidden.

These not-qrv tags will be stored at the internal database and thatswhy being recreated in case of restarting kst4Contest. It's resettable via the settings, have a look to 5)j)Worked station database settings.



8) Is there anything else that needs to be written?

The client is still under development and there are some things I want to implement in the future. So stay tuned if you like it.

I am thankful for all reported bugs and hints for what I could implement to increase the usability or the contest workflow.

Special thanks to **Gianluca Costantino, IU3OAR, Alessandro Murador, IZ3VTH, Reczetár István, HA1FV** for testing and reports (some others as well).

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Initially it never was planned to publish this software but some people had written to me if they could use it.

a) Some counts...

There are innumerable hours of time in this software and (state today) **20.000 lines of code**.

b) GitHub

Project source is at gitHub.

https://github.com/praktimarc/kst4contest

c) Donation creates motivation

I would be also thankful for donations. The motto is: donation causes motivation.

https://www.paypal.com/paypalme/do5amf

73 de DO5AMF, Marc

14.05.24