

www.voacap.com/planner.html

VOACAP Propagation Planner

A Planning Tool for Contesters and DXers

Preface

Preparing and planning for any worldwide contest or DX expedition (or hunting a DX) require a thorough analysis of propagation predictions. The propagation predictions help you, so to speak, get a good grasp of the playing field, i.e. where to play and when. The predictions tell you when and on what bands the best openings are in the given direction at a suitable signal strength, so that the QSO rates can be maintained at their best; at what times it's good to use those valuable long-path openings, and when to focus on working those hard-to-reach areas while the band opens elsewhere at the same time.

For these specific purposes I developed a new service on my Web site — VOACAP Propagation Planner. It provides VOACAP propagation predictions as numeric data, which can then be entered into an Excel template giving you zone-specific summaries and thus helping to create your own contest or DX operation plan.

It all boils down to making optimum use of the openings — being in the right place at the right time. So, the better predictions you have, the better basis for operating planning. Nevertheless, we must remember that predictions are just that — predictions, not exact science. And, due to the nature of VOACAP, you must visualize low-band openings with the help of grayline map software such as DX Atlas by Alex VE3NEA or GeoClock by Joe Ahlgren. VOACAP predictions are of less help there.

VOACAP Propagation Planner is in two parts:

- 1) a Web site (www.voacap.com/planner.html) that offers VOACAP predictions as numeric data, and
- 2) Windows and Mac software called PropPlanner (together with a user's manual plus an Excel template) that helps you work on the VOACAP prediction data on your own computer and make it more usable.

Step 1. Creating a numeric VOACAP prediction online

To begin, we will start by creating a numeric VOACAP prediction online at www.voacap.com/planner.html. This will provide us with the raw material which we will then process into a working propagation prediction with the help of PropPlanner and Excel.

The screenshot shows the VOACAP Propagation Planner web interface. It is divided into four main sections:

- Date:** Year: 2012, Month: October.
- TX Site Settings:** QTH: << Select a location >>, Name: KP03SD (with a 'Loc calc' button), Latitude: 63.146 [-90..90], Longitude: 21.542 [-180..180]. Antennas: 10M: 3-el Yagi @ 15M (50ft), 12M: 3-el Yagi @ 15M (50ft), 15M: 3-el Yagi @ 15M (50ft), 17M: 3-el Yagi @ 15M (50ft), 20M: 3-el Yagi @ 15M (50ft), 30M: Dipole @ 15M (50ft), 40M: Dipole @ 15M (50ft), 80M: Dipole @ 15M (50ft). Power: 1500 W, Mode: CW.
- Ionospheric Parameters:** Sporadic E: No.
- DX Site Settings:** Antennas: 10M: 3-el Yagi @ 15M (50ft), 12M: 3-el Yagi @ 15M (50ft), 15M: 3-el Yagi @ 15M (50ft), 17M: 3-el Yagi @ 15M (50ft), 20M: 3-el Yagi @ 15M (50ft), 30M: Dipole @ 15M (50ft), 40M: Dipole @ 15M (50ft), 80M: Dipole @ 15M (50ft). DX sites: All 40 CQ Zones, Short Path, All 40 CQ Zones, Long Path.

A 'Run the prediction!' button is located at the bottom right of the form.

Image 1. The home page of VOACAP Propagation Planner at www.voacap.com/planner.html

The user interface is divided into four sections: Date, TX Site Settings, Ionospheric Parameters and DX Site Settings. Let's take a closer look at the parameters:

- In the Date section you will choose the year and month for your prediction. At the moment, the years available are 2012, 2013 and 2014. The list will be regularly updated. The two parameters will be used to select the correct Smoothed Sunspot Number (SSN) for VOACAP calculations.
- In the TX Site Settings section you will enter the coordinates of the Transmitter (TX), the antennas to be used for predictions, the transmitting power and the transmitting mode.

The transmitter's coordinates can be entered in three alternative ways:

1. Choose the appropriate location (QTH) from the QTH pop-up menu. This menu offers a wide selection of pre-defined DXCC countries and more (currently 480 locations).
2. Type a Maidenhead grid locator into the Name field and press the "Loc calc" button. The corresponding coordinates will be calculated for you and entered into the Latitude and Longitude fields.
3. Enter the Latitude and Longitude coordinates manually in their fields in decimal format. To find the correct coordinates, you can use my Google Maps based QTH Locator as an aid.

Then you will need to enter the transmitting antenna details for all bands from 80 Meters to 10 Meters. Choosing a correct antenna is one of things that contribute to a good prediction. There is a wide selection of antennas (verticals, dipoles, yagis and an isotrope) to choose from:

1/4 wl Vertical
 5/8 wl Vertical
 3/2 wl Vertical
 Dipole @ 10M (33ft)
 Dipole @ 15M (50ft)
 Dipole @ 20M (66ft)
 Dipole @ 25M (82ft)
 Dipole @ 30M (99ft)
 Dipole @ 40M (132ft)
 Dipole @ 60M (198ft)
 3-el Yagi @ 10M (33ft)
 3-el Yagi @ 15M (50ft)
 3-el Yagi @ 20M (66ft)
 3-el Yagi @ 25M (82ft)
 3-el Yagi @ 30M (99ft)
 3-el Yagi @ 40M (132ft)
 3-el Yagi @ 60M (198ft)
 5-el Yagi @ 10M (33ft)
 5-el Yagi @ 15M (50ft)
 5-el Yagi @ 20M (66ft)
 5-el Yagi @ 25M (82ft)
 5-el Yagi @ 30M (99ft)
 5-el Yagi @ 40M (132ft)
 5-el Yagi @ 60M (198ft)
 8-el Yagi @ 10M (33ft)
 8-el Yagi @ 15M (50ft)
 8-el Yagi @ 20M (66ft)
 8-el Yagi @ 25M (82ft)
 8-el Yagi @ 30M (99ft)
 8-el Yagi @ 40M (132ft)
 8-el Yagi @ 60M (198ft)
 Isotrope (12 dBi gain)
 10 M 4x JP2000

If you wish to see VOACAP's view of all potential openings, choose the 12-dBi isotrope (transmit and receive) antenna for all bands. The 12-dBi gain is valid for elevation angles

from 0 to 90 degrees. Typically, you would choose the antenna types which are the closest match to the antennas you really use. This will bring the prediction closer to the "reality".

The transmitting power can be selected from eight pre-defined values between 1-1,500 watts. The transmitting modes available are CW (Morse), SSB (Single-Side Band, Phone) and AM (Amplitude Modulation). The selection of the transmitting mode sets the reference for VOACAP's Reliability (REL) calculations. The REL output value is one of the parameters which we will consider as we work on and interpret the VOACAP prediction.

- In the Ionospheric Parameters section you can choose if you want to consider the effects of a possible Es layer. Setting this to "Yes" can be useful for summer-time predictions. The default value is "No".
- In the DX Site Settings section you will need to choose the antennas of the receiving (DX) site for each band from 80 Meters to 10 Meters. Of course, if you make predictions for a DXpedition, the coordinates of the DXpedition site will be entered in the TX Site section, and the rest of the world is considered to be the "DX sites". The antenna selection is the same as in the TX Site section. In reality, you cannot possibly enter all the possible antennas the DX stations may have but you must choose an appropriate "reference antenna", e.g. a 3-element Yagi at 15 meters (50 feet) above the ground.

Then you must select a collection of pre-defined receiving sites, i.e. the "DX Sites". There are two identical collections available (one for Short-Path and the other one for Long-Path predictions) that extensively cover all the 40 CQ Zones around the world. Each collection contains 54 receive sites. As we know, some CQ Zones, for instance the Zones 14 and 15, are geographically large and only one location per Zone cannot represent that Zone well enough.

01 KL7	20 4X
02 VO2	20 LZ
03 VE7	21 A7
03 W6	22 VU
04 W0	23 JT
04 W5	24 BY
05 W1	24 VR2
05 W4	25 JA
06 XE	26 HS
07 TI	27 DU
08 KP4	27 KH2
09 8R	28 YB
10 OA	29 VK6
11 PY2	30 VK3
11 PY7	31 KH6
12 CE	32 KH8
13 LU	32 ZL
14 EA	33 EA8
14 G	34 ST
14 LA	35 5N
15 I	35 6W
15 OH	36 9Q
15 OM	36 ZD8
16 UA3	37 5Z
17 UN	38 ZS6
18 UA9	39 5R
19 UA0	40 TF

Image 2. The countries included in the DX Site collection (the Zone number and DXCC country shown above).

When you are done with the input values, it's time for VOACAP to calculate the prediction from the transmitting (TX) site to all the receive (DX) sites in the DX Site collection. This means 54 point-to-point calculations per collection. More collections can be created if necessary. Please contact the author.

Now you can finally press the "Run the prediction" button, and wait for a few seconds as the result page comes up.

Your prediction is done! Now take the next steps:

1. Download [your VOACAP prediction as a text file](#) (right-click to save target to disk)
2. A propagation data analysis tool, **Propagation Planner**, is available for [Windows](#) and [Intel Macs](#) (v0.9).
3. Open the prediction text file with Propagation Planner
4. Download **this Excel workbook** [\[Office 2010\]](#) or [\[Office 2003 and earlier\]](#), and copy the band-specific predictions from Propagation Planner to their corresponding tabs (80...10) in the workbook. The 40+ CQ Zone summary tabs will be populated automatically!
5. **Enjoy!**

To make another VOACAP prediction, go back using the browser's Back button - or [click here](#).

Image 3. The result page at VOACAP Propagation Planner

On the result page you will see the next steps to take. First, you will need to download the numeric VOACAP prediction on your computer. Download by right-clicking the hyperlink ("your VOACAP prediction as a text file") with your (right-handed) mouse and save the target (the default filename is "prediction.txt" – feel free to rename it before saving) to an appropriate location on your hard disk. If you just click the link, you will see the raw data in textual form (see image 4 for an example).

```

.....
IONOSPHERIC COMMUNICATIONS ANALYSIS AND PREDICTION PROGRAM
      VOACAP  VERSION 12.0721I

      1          2          3          4          5          6          7
12345678901234567890123456789012345678901234567890123456789012345

COMMENT  Any VOACAP default cards may be placed in the file: VOACAP.DEF
LINEMAX  250          number of lines-per-page
CCEFFS   CCIR
TIME     1  24  1  1
MONTH    2012 10.00
SUNSPOT  77.
SYSTEM   1. 155. 0.10  90. 24.0  3.00  0.10
FPROB    1.00 1.00 1.00 0.00
ANTENNA  1  1  2  5  0.000[voaant/d15m.ant ] 0.0  1.5000
ANTENNA  1  2  5  8  0.000[voaant/d15m.ant ] 0.0  1.5000
ANTENNA  1  3  8 12  0.000[voaant/d15m.ant ] 0.0  1.5000
ANTENNA  1  4 12 15  0.000[voaant/3e115m.ant ] 0.0  1.5000
ANTENNA  1  5 15 19  0.000[voaant/3e115m.ant ] 0.0  1.5000
ANTENNA  1  6 19 22  0.000[voaant/3e115m.ant ] 0.0  1.5000
ANTENNA  1  7 22 26  0.000[voaant/3e115m.ant ] 0.0  1.5000
ANTENNA  1  8 26 30  0.000[voaant/3e115m.ant ] 0.0  1.5000
ANTENNA  2  9  2  5  0.000[voaant/d15m.ant ] 0.0  0.0000
ANTENNA  2 10  5  8  0.000[voaant/d15m.ant ] 0.0  0.0000
ANTENNA  2 11  8 12  0.000[voaant/d15m.ant ] 0.0  0.0000
ANTENNA  2 12 12 15  0.000[voaant/3e115m.ant ] 0.0  0.0000
ANTENNA  2 13 15 19  0.000[voaant/3e115m.ant ] 0.0  0.0000
ANTENNA  2 14 19 22  0.000[voaant/3e115m.ant ] 0.0  0.0000
ANTENNA  2 15 22 26  0.000[voaant/3e115m.ant ] 0.0  0.0000
ANTENNA  2 16 26 30  0.000[voaant/3e115m.ant ] 0.0  0.0000
FREQUENCY 3.50 7.1010.1014.1018.1021.1024.9028.20 0.00 0.00 0.00
METHOD    30  0
BOTTLINES 1  8 10 12
TOPLINES  1  2  3  4  5  6
LABEL     KP03SD          01 KL7 SP
CIRCUIT   63.15N  21.54E  61.00N  150.00W  S  0
EXECUTE

```

Image 4. An example of the first few lines in a raw numeric VOACAP prediction.

Next, you will need to download the PropPlanner software which is a simple propagation data extraction and analysis tool. Its main function is to read the raw numeric data into its internal database and filter the data so that it can be copied into Excel (or Excel compatible program) for final analysis. The PropPlanner program is available for Windows and Intel Macs (OS X).

You must also download the ready-made Excel spreadsheet template which automatically creates zone-specific VOACAP predictions (80M to 10M, from the TX Site to 54 DX Site locations) from user-entered band-specific (80M to 10M) prediction data.

Step 2. Using the PropPlanner

The PropPlanner program helps extract the relevant data from the raw data and gives simple tools to filter data, too. Download the PropPlanner directly here: <http://www.voacap.com/PropPlanner-0.9.zip> (Windows) or <http://www.voacap.com/PropPlanner-0.9.app.tar.zip> (Mac).

There are three sections (top, middle and bottom) in the user interface of the PropPlanner program:

1. Top section: the internal database view (physically the database is located in the installation directory of PropPlanner with the name of PropPlannerDatabase.rdb). The column headings (TX, RX, FREQ, SSN, MONTH, HOUR, SDBW, SNR, REL, MODE and TO) show which details have been extracted from the raw VOACAP prediction file. The # column is an internal database index number.
2. Middle section: output filters. The prediction results will be viewed by band (80M is the default). The actual filters are: REL (the reliability of achieving a QSO, %), SNR (the signal-to-noise ratio) and the median S-meter reading. More to follow.
3. Bottom section: predictions by Zone. At each UTC hour, three values will be shown by Zone (the zones are horizontally arranged in columns): REL (%), SNR (dB) and the median S-meter reading. There are 54 DX Sites covering all 40 CQ Zones. Technically speaking, the bottom section is a text field, which allows it to be copied and pasted into Excel or any program.

The 54 DX Sites run from left to right, and the UTC time runs from 01 UTC to 24 UTC.

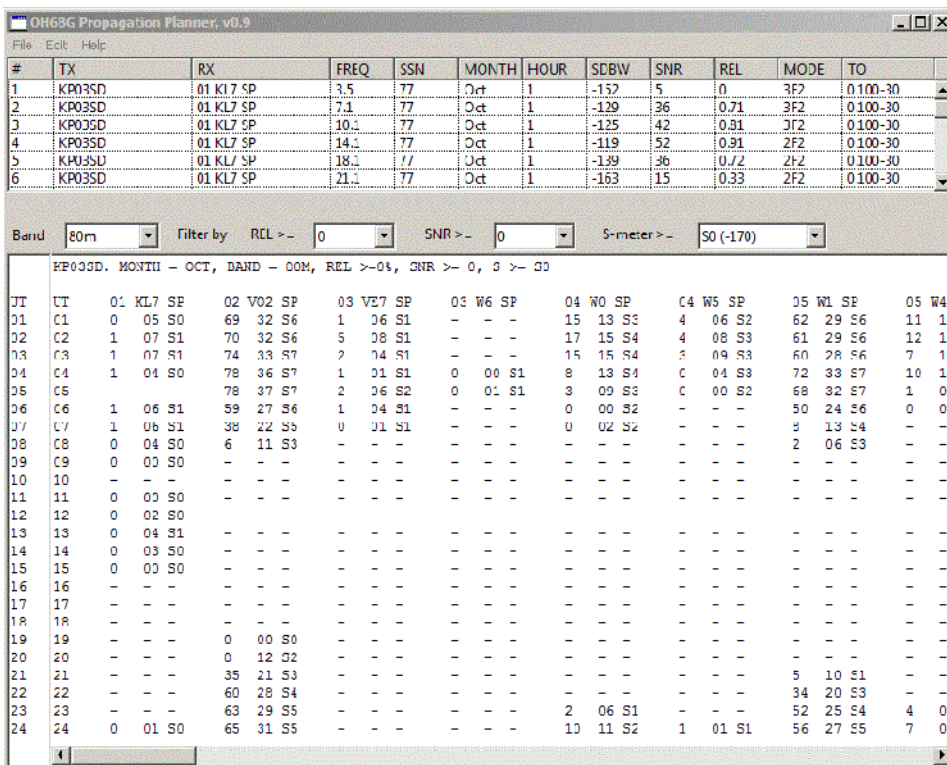


Image 5. The user interface of PropPlanner, the data extraction and filtering tool.

Let's now take a look at the basic functions of the PropPlanner program.

2.1. Reading the raw data into the program

The numeric VOACAP propagation prediction data (the file "prediction.txt") which we received from the online service in text format, needs to be read into a database for easier filtering and analysis. PropPlanner will automatically create a database (PropPlannerDatabase.rdb) for this purpose. When the raw data has been read into the database, there is an internal view to it in the top section of the PropPlanner user interface (see image 5, top section). Typically, a DX Site collection with 54 locations will create a database of more than 10,000 data rows.

To read the raw data in, choose "Open VOACAP output..." from the File menu. You can also use a keyboard shortcut Ctrl-O (see image 6).

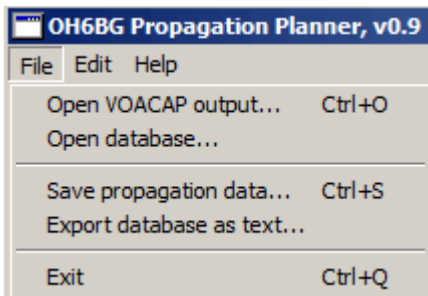


Image 6. The File menu options

This will prompt a file selection window which by default shows the files in the installation directory of PropPlanner. Therefore, it is a good idea to save different prediction sets in sub-directories of their own under the installation directory.

Now select the file named "prediction.txt", and press the "Open" button (see image 7).

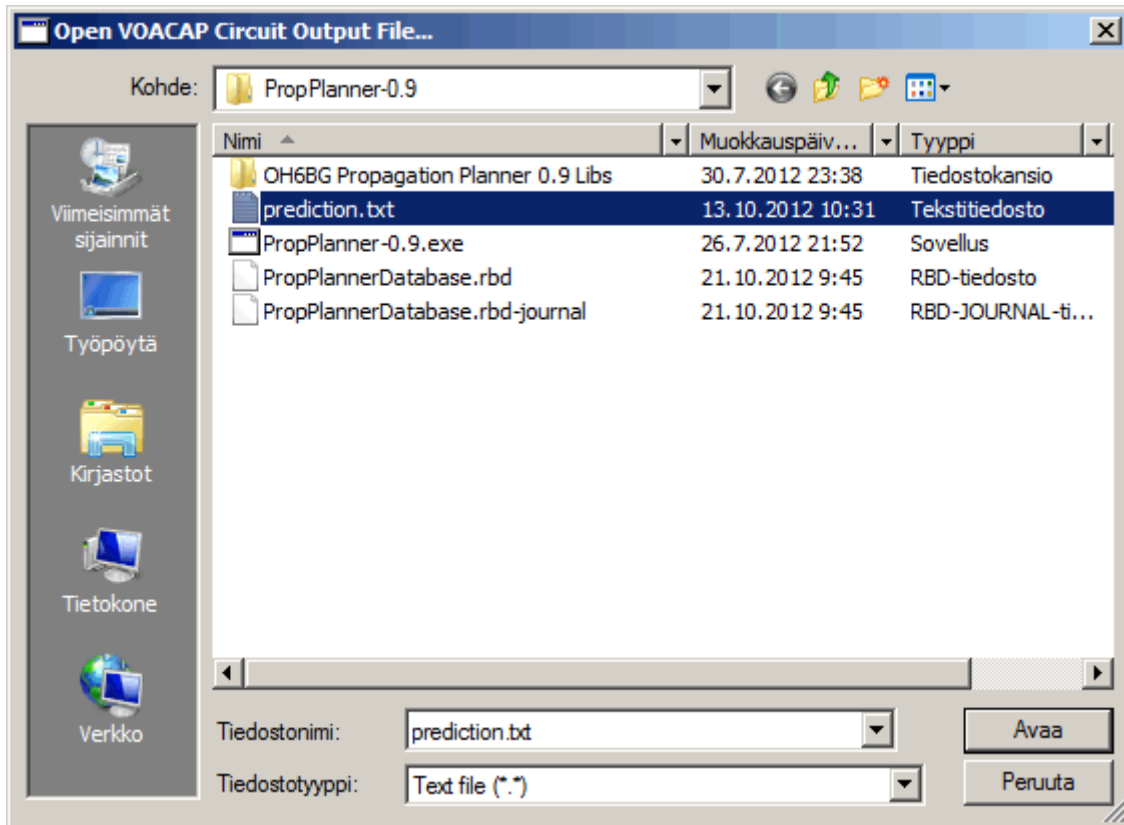


Image 7. Choose the file "prediction.txt" and press the "Open" button. Please note that the button names are translated into the language of your operating system. Here in the Finnish version of Windows 7, "Avaa" = "Open".

After you pressed the Open button, the raw prediction file will be read in. This typically may take a while but should not be more than a few minutes in slow computers. When the process is finished, the prediction for 80 meters will be filtered from the database, and shown in the bottom section of the user interface (see image 5, bottom section).

Now you can start to view the prediction for all other bands as well as experiment with the filters in the middle section of the user interface: REL, SNR and S-meter.

Important note! If you quickly change the bands, or quickly move from one filter to another, or select new filter values too quickly, the program may crash (happened many times). This happens because each time you touch these filters, the database must be accessed to get the results. For some reason, the program does not tolerate quick changes. So my advice is that you will patiently wait for a few seconds until the results come up and then move on.

#	TX	RX	FREQ	SSN	MONTH	HOUR	SDBW	SNR	REL	MODE	TO
1	KP03SD	01 KL7 SP	3.5	77	Oct	1	-152	5	0	3F2	0.100-30
2	KP03SD	01 KL7 SP	7.1	77	Oct	1	-129	36	0.71	3F2	0.100-30
3	KP03SD	01 KL7 SP	10.1	77	Oct	1	-125	42	0.81	3F2	0.100-30
4	KP03SD	01 KL7 SP	14.1	77	Oct	1	-119	52	0.91	2F2	0.100-30
5	KP03SD	01 KL7 SP	18.1	77	Oct	1	-139	36	0.72	2F2	0.100-30
6	KP03SD	01 KL7 SP	21.1	77	Oct	1	-163	15	0.33	2F2	0.100-30

Band	80m	Filter by	REL >= 0	SNR >= 0	S-meter >= S0 (-170)
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KP03SD, MONTH = OCT, BAND = 80M, REL >= 0%, SNR >= 0, S >= S0

UT	UT	01 KL7 SP	02 VO2 SP	03 VE7 SP	03 W6 SP	04 W0 SP	04 W5 SP	05 W1 SP	05 W4
01	01	0 05 S0	69 32 S6	1 06 S1	- - -	15 13 S3	4 06 S2	62 29 S6	11 13

Image 8. Changing the band for prediction and using the filters in the middle section. To avoid program crash, wait for the results to show until you try new bands or filter values.

2.2. Viewing and understanding the prediction results

Let's take now a look at the bottom section of the PropPlanner window. The propagation predictions are shown from the TX Site to 54 DX Sites from left to right. Because there are 54 columns, you will need to scroll the bottom section window horizontally to see all the details. This is also why there is a separate UTC column on the left side of the actual prediction window.

#	TX	RX	FREQ	SSN	MONTH	HOUR	SDBW	SNR	REL	MODE	TO
1	KP03SD	01 KL7 SP	3.5	77	Oct	1	-152	5	0	3F2	0.100-30
2	KP03SD	01 KL7 SP	7.1	77	Oct	1	-129	36	0.71	3F2	0.100-30
3	KP03SD	01 KL7 SP	10.1	77	Oct	1	-125	42	0.81	3F2	0.100-30
4	KP03SD	01 KL7 SP	14.1	77	Oct	1	-119	52	0.91	2F2	0.100-30
5	KP03SD	01 KL7 SP	18.1	77	Oct	1	-139	36	0.72	2F2	0.100-30
6	KP03SD	01 KL7 SP	21.1	77	Oct	1	-163	15	0.33	2F2	0.100-30

UT	UT	01 KL7 SP	02 VO2 SP	03 VE7 SP	03 W6 SP	04 W0 SP	04 W5 SP	05 W1 SP	05 W4
01	01	0 05 S0	69 32 S6	1 06 S1	- - -	15 13 S3	4 06 S2	62 29 S6	11 13
02	02	1 07 S1	70 32 S6	5 08 S1	- - -	17 15 S4	4 08 S3	61 29 S6	12 14
03	03	1 07 S1	74 33 S7	2 04 S1	- - -	15 15 S4	3 09 S3	60 28 S6	7 13
04	04	1 04 S0	78 36 S7	1 01 S1	0 00 S1	8 13 S4	0 04 S3	72 33 S7	10 15
05	05	- - -	78 37 S7	2 06 S2	0 01 S1	3 09 S3	0 00 S2	68 32 S7	1 09
06	06	1 06 S1	59 27 S6	1 04 S1	- - -	0 00 S2	- - -	50 24 S6	0 02
07	07	1 06 S1	38 22 S5	0 01 S1	- - -	0 02 S2	- - -	8 13 S4	- -
08	08	0 04 S0	6 11 S3	- - -	- - -	- - -	- - -	2 06 S3	- -
09	09	0 00 S0	- - -	- - -	- - -	- - -	- - -	- - -	- -
10	10	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- -
11	11	0 00 S0	- - -	- - -	- - -	- - -	- - -	- - -	- -
12	12	0 02 S0	- - -	- - -	- - -	- - -	- - -	- - -	- -
13	13	0 04 S1	- - -	- - -	- - -	- - -	- - -	- - -	- -
14	14	0 03 S0	- - -	- - -	- - -	- - -	- - -	- - -	- -
15	15	0 00 S0	- - -	- - -	- - -	- - -	- - -	- - -	- -
16	16	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- -
17	17	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- -
18	18	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- -
19	19	- - -	0 00 S0	- - -	- - -	- - -	- - -	- - -	- -
20	20	- - -	8 12 S2	- - -	- - -	- - -	- - -	- - -	- -
21	21	- - -	35 21 S3	- - -	- - -	- - -	- - -	5 10 S1	- -
22	22	- - -	60 28 S4	- - -	- - -	- - -	- - -	34 20 S3	- -
23	23	- - -	63 29 S5	- - -	- - -	2 06 S1	- - -	52 25 S4	4 06
24	24	0 01 S0	65 31 S5	- - -	- - -	10 11 S2	1 01 S1	56 27 S5	7 06

Image 9. The propagation predictions on the 80-Meter band from the grid locator KP03SD to 54 DX Sites, representing the 40 CQ Zones.

In Image 9, you will see a lot of details. Let's talk about them. First of all, one column, here "02 VO2 SP", represents one CQ Zone. "02" is the number of the CQ Zone, "VO2" is a more detailed DXCC location within that Zone, and "SP" means a "Short-Path" prediction. If you had run Long-Path predictions, here the letters would be "LP". As you can see, for some geographically large CQ Zones, there can be two locations in that Zone, here for example for Zone 03: "03 VE7" and "03 W6".

One practical tip on how to use horizontal scrolling. Let's say that you want to know from which part of the world the best QSO masses (or the worst QRM) may come at the given UTC hour. Just

triple-click a line in the prediction window and that line will be activated (see Image 9 at 03 UTC). Then start scrolling horizontally and you will quickly get an overview of the prediction details in all Zones.

What does the prediction say?

OK, now comes the fun part! What do those numbers in the columns really mean? Let's have a look at the prediction in Image 10 – a circuit from OH (KP03SD) to VO2 on 15M at 15 UTC.

KP03SD. MONTH = OCT, BAND = 15M,

UT	01	KL7	SP	02	VO2	SP
01	33	15	S0	-	-	-
02	-	-	-	-	-	-
03	-	-	-	-	-	-
04	-	-	-	-	-	-
05	-	-	-	-	-	-
06	-	-	-	-	-	-
07	-	-	-	-	-	-
08	-	-	-	-	-	-
09	-	-	-	-	-	-
10	-	-	-	-	-	-
11	-	-	-	23	09	S0
12	-	-	-	88	48	S4
13	-	-	-	97	64	S7
14	-	-	-	98	65	S7
15	-	-	-	98	65	S7
16	-	-	-	94	56	S6
17	-	-	-	92	54	S5
18	59	29	S1	87	47	S4
19	63	31	S1	65	32	S2
20	22	08	S0	52	25	S0
21	60	29	S1	-	-	-
22	51	25	S0	-	-	-
23	47	22	S0	-	-	-
24	40	19	S0	-	-	-

Image 10. The VOACAP prediction for the circuit from OH to VO2 on 15 Meters at 15 UTC.

Each cell will have three output parameters, taken from the VOACAP prediction and separated by a space:

1. The reliability for a successful QSO (0-100%). This is the REL output parameter in the VOACAP terminology. This value has a direct relation to the transmitting mode selected. In our example (Image 10) above, this value is "98" (%).
2. The signal-to-noise ratio, or SNR (expressed in dB). This is a median value which is calculated from the signal power and noise power. This value can be compared to and assessed with regard to the minimum reference values of the chosen transmitting mode. The minimum workable values which I have chosen for the transmitting modes are as follows: CW = 24, SSB = 38 and AM = 49. In our example above, VOACAP has calculated a value of "65" (dB) which greatly exceeds the minimum reference values for any transmitting mode.

- The S-meter reading. This value is calculated from VOACAP's signal power value (SDBW). As this is also a median value, the actual S-meter reading can vary widely above and below the predicted S-meter reading. In this example, the prediction says "S7" which represents a pretty good signal. Please note that the S-meter reading of "S9" means any value between S9 to S9+60 dB!

Our example in Image 10 represented perhaps the most typical case. There are sometimes, however, much more difficult cases to consider: Predictions on 10 Meters and Predictions on 80 Meters.

Predictions on 10 Meters, or on High Bands

First, let's talk about 10 Meters (or any high band in general) with the help of Image 11.

KP03SD. MONTH = OCT, BAND = 10M,

UT	01	KL7	SP	02	VO2	SP
01	-	-	-	-	-	-
02	-	-	-	-	-	-
03	-	-	-	-	-	-
04	-	-	-	-	-	-
05	-	-	-	-	-	-
06	-	-	-	-	-	-
07	-	-	-	-	-	-
08	-	-	-	-	-	-
09	-	-	-	-	-	-
10	-	-	-	-	-	-
11	-	-	-	-	-	-
12	-	-	-	-	-	-
13	-	-	-	-	-	-
14	-	-	-	46	22	S0
15	-	-	-	30	13	S0
16	-	-	-	-	-	-
17	-	-	-	-	-	-
18	-	-	-	-	-	-
19	-	-	-	-	-	-
20	-	-	-	-	-	-
21	-	-	-	-	-	-
22	-	-	-	-	-	-
23	-	-	-	-	-	-
24	-	-	-	-	-	-

Image 11. The 10-Meter prediction from OH to VO2 at 14 UTC and 15 UTC.

If we believe this prediction, it says that there is a 46% chance for QSOs at 14 UTC and a 30% chance at 15 UTC. Then if we look at the SNR values: 22 dB at 14 UTC and 13 dB at 15 UTC. Now this prediction was made for the CW mode (with the lowest reference value of 24 dB) so that explains the 46% value at 14 UTC. The percentage values of 46 and 30 are in direct relation to the minimum (median) SNR value set for the transmitting mode, in this case, for CW (24 dB).

BUT please note the S-meter readings of S0! This is an S-meter reading of Zero; it means that there should not be enough (median) signal power available but despite this, the SNR and REL values are nevertheless at quite decent levels. This happens because the noise power is even

much lower, and this is especially true on high bands. And it also happens that the circuit MUF is not reaching 28 MHz at all. So what can we say about this? Most probably that there may be some probability (perhaps for a couple of days in the month) for this circuit to work but do not expect it to be open over 10 days during the month. If not more than that, the prediction can show us the times when to be alert on this band – you never know if the conditions are better than the average!

Predictions on 80 Meters, or on Low Bands

Now, let's talk about 80 Meters (or the low bands in general) with the help of Image 12.

UT	25 JA SP	26 HS SP	27 DU SP
01	- - -	- - -	- - -
02	- - -	- - -	- - -
03	- - -	- - -	- - -
04	- - -	- - -	- - -
05	- - -	- - -	- - -
06	- - -	- - -	- - -
07	- - -	- - -	- - -
08	- - -	- - -	- - -
09	- - -	- - -	- - -
10	- - -	- - -	- - -
11	- - -	- - -	- - -
12	- - -	- - -	- - -
13	- - -	- - -	- - -
14	- - -	- - -	- - -
15	0 00 S2	- - -	- - -
16	1 04 S3	- - -	- - -
17	2 07 S3	- - -	- - -
18	6 10 S3	0 05 S4	- - -
19	14 14 S4	1 07 S5	0 01 S4
20	12 13 S3	2 09 S5	0 02 S4
21	11 12 S2	1 03 S3	- - -
22	1 06 S1	0 00 S3	- - -
23	- - -	1 03 S3	- - -
24	- - -	- - -	- - -

Image 12. The 80-Meter prediction from OH (KP03SD) to CQ Zones 25, 26 and 27.

It is a known fact that VOACAP heavily under-predicts long-distance (DX) circuits on low-bands. It does a decent job on short-range circuits, however. This is also the reason why I strongly discourage the use of VOACAP on 160 Meters in the DX sense. Predictions on 80 Meters are also quite miserable. And when we recall that VOACAP cannot take into account the effects of grayline, which are quite predominant on the low bands in general, I strongly encourage the use of grayline mapping software for the low bands, instead of blindly trusting VOACAP.

Let's take a look at the grayline map (Image 13) at 17 UTC for the circuit from KP03SD (Finland) to HS (Thailand):

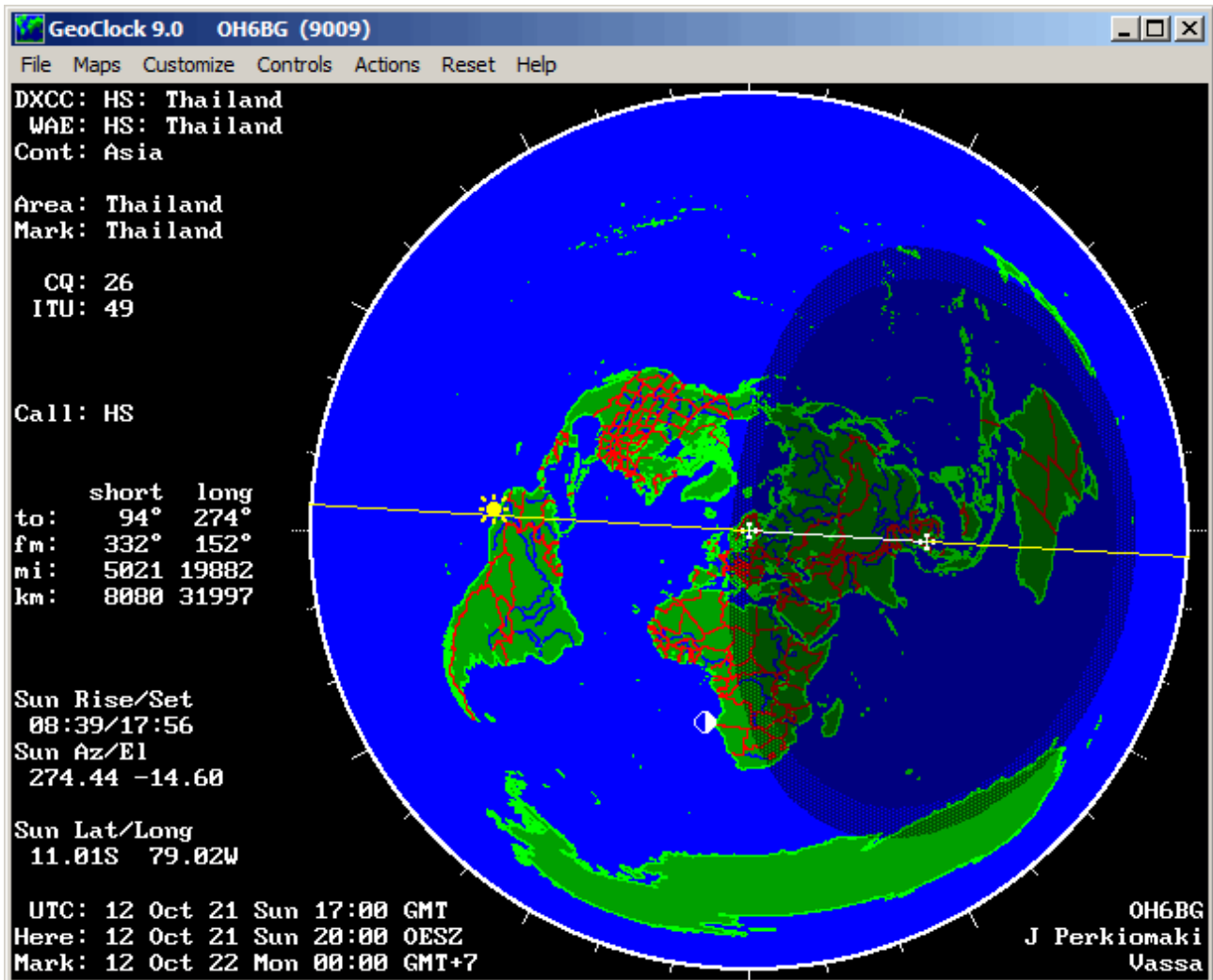


Image 13. Grayline map at 17 UTC: Finland to Thailand.

Finland is still a little bit in the grayline zone and it's midnight in Thailand. This should be one of more favorable conditions on low bands. The other two are (1) sunrise in Thailand at about 22-23 UTC when it's dark in Finland and (2) sunset in Finland starting at around 16 UTC when it's already dark in Thailand.

As we can see in Image 12 above, VOACAP does not predict anything for 17 UTC. At 22-23 UTC (sunrise in Thailand), the QSO reliability is zero to one percent (practically non-existent), SNR values are zero to three dB. If we believe VOACAP, there is no chance for any QSOs on any day of the month on 80 Meters.

Nevertheless, VOACAP predicts decent signal power levels (S-meter reading of S5!), especially at 19-20 UTC! So, what to do? On the practical level, it's a good idea to keep an eye on the signal power levels and ignore the QSO probability and SNR predictions. In addition, we definitely need to use the grayline maps and visualize the hours when the Transmitter or the Receive sites are in the dark and especially in the grayline zone.

Step 3. Using Excel for final analysis

The final step consists of using Excel (or Excel compatible program such as LibreOffice) for creation of zone-specific predictions for all bands from 80 Meters to 10 Meters. Here I strongly suggest use of my ready-made Excel workbook template (available at the result page of the online service, or via this direct link: <http://www.voacap.com/planner/prop-planner.xlsx> . This workbook automatically creates the zone-specific predictions from band-specific data.

What I personally do is that I choose one band in the PropPlanner, copy all the contents of the bottom section (the prediction results) and paste that contents into the corresponding sub-page (tab) in Excel. So, if I copy the 80M prediction from PropPlanner, I will then paste it into the "80M" tab in Excel. The same procedure is valid for all the other bands as well up to 10 Meters. You must not paste anything into the Zone-specific tabs such as "01 KL7". All zone-specific tabs (sub-pages) will be automatically populated from the band-specific data.

Let me show you an example. First, open the Excel template, it will look like in Image 14 below.

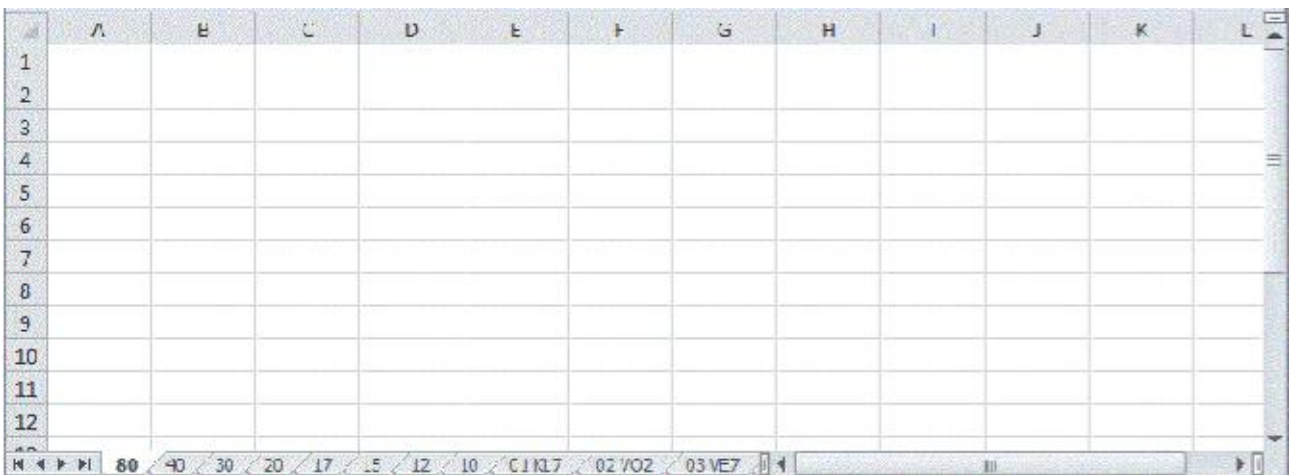


Image 14. This is a portion of the empty Excel workbook. At the bottom of the Excel sheet, please locate the tabs "80" to "10". These are the band-specific sub-pages from (0 meters to 10 Meters that you will need to fill out with the data from PropPlanner. Do not touch the tabs labeled "01 KL7", "02 VO2", "03 VE7", etc.

Then open the PropPlanner if it's not already open. Then follow the instructions in Image 15.

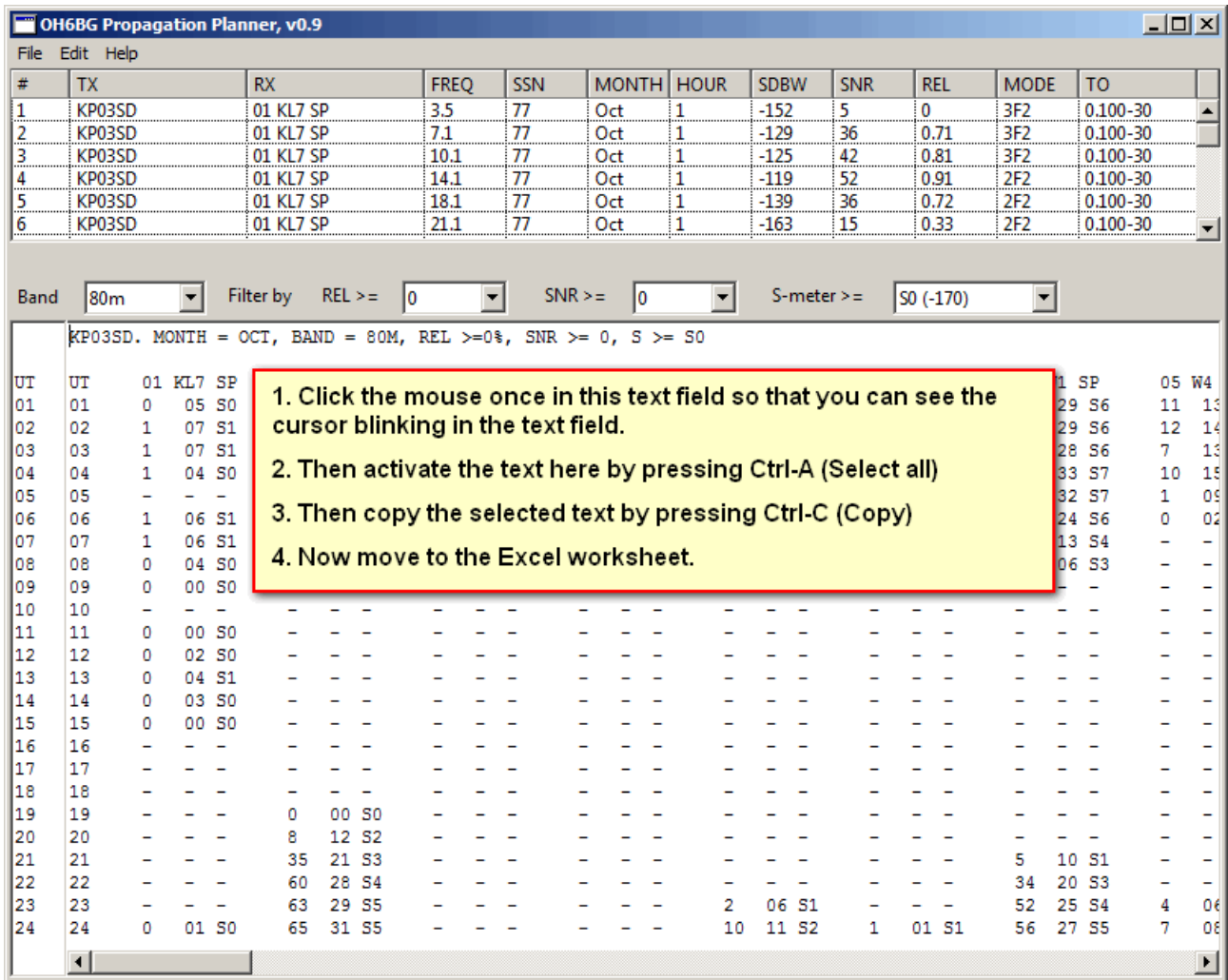
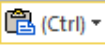


Image 15. The instructions on how to copy prediction data band by band from PropPlanner into Excel.

Now the prediction data from the specific band is located in the computer's memory. In this example case, we copied the prediction for 80 Meters into the memory.

Now, in Excel, select the "80" tab and paste the data from the computer's memory onto the page by pressing Ctrl-V (Paste). See detailed instructions below (Image 16).

	A	B	C	D	E	F	G	H	I	J
1	KP03SD. MONTH = OCT, BAND = 80M, REL >=0%, SNR >= 0, S >= S0									
2										
3	UT	01 KL7 SP	02 VO2 SP	03 VE7 SP	03 W6 SP	04 W0 SP	04 W5 SP	05 W1 SP	05 W4 SP	06 XE SP
4		1 0 05 S0	60 22 66	1 06 S1		15 12 63	1 06 S3	63 28 66	11 13 S4	- - -
5		2 1 07 S1								4 1 02 S2
6		3 1 07 S1								1 05 S2
7		4 1 04 S0								5 0 02 S2
8		5 - - -								- - -
9		6 1 06 S1								- - -
10		7 1 06 S1								- - -
11		8 0 04 S0								- - -
12		9 0 00 S0								- - -
13		10 - - -								- - -
14		11 0 00 S0								- - -
15		12 0 02 S0	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
16		13 0 04 S1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
17		14 0 03 S0	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
18		15 0 00 S0	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
19		16 - - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
20		17 - - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
21		18 - - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
22		19 - - -	0 00 S0	- - -	- - -	- - -	- - -	- - -	- - -	- - -
23		20 - - -	8 12 S2	- - -	- - -	- - -	- - -	- - -	- - -	- - -
24		21 - - -	35 21 S3	- - -	- - -	- - -	- - -	5 10 S1	- - -	- - -
25		22 - - -	60 28 S4	- - -	- - -	- - -	- - -	34 20 S3	- - -	- - -
26		23 - - -	63 29 S5	- - -	- - -	2 06 S1	- - -	52 25 S4	4 06 S2	- - -
27		24 0 01 S0	65 31 S5	- - -	- - -	10 11 S2	1 01 S1	56 27 S5	7 08 S3	

1. To paste prediction data from PropPlanner into Excel, first click on the cell A1.

2. Then paste the data by pressing Ctrl-V (Paste).

3. Then click again on the cell A1 to remove the highlighting of the data.

4. Move to the next tab by clicking it (in this case, the tab "40" below), and repeat the procedure with the prediction data for that band.

Image 16. Instructions on how to paste prediction data from PropPlanner into Excel, band by band.

After you have populated the band-specific prediction data from 80 Meters to 10 Meters, the zone-specific predictions have been created automatically. Let's take a look at the circuit from KP03SD to Zone 3 (W6) (see image 17).

	A	B	C	D	E	F	G	H	I
1	UT	80M	40M	30M	20M	17M	15M	12M	10M
2	1	- - -	51 25 S3	72 36 S5	91 51 S7	84 45 S5	74 37 S3	30 14 S0	- - -
3	2	- - -	52 25 S4	68 34 S5	90 50 S6	80 41 S4	48 23 S0	- - -	- - -
4	3	- - -	52 25 S4	70 35 S5	85 45 S5	40 19 S0	- - -	- - -	- - -
5	4	0 00 S1	53 25 S4	80 41 S6	80 41 S5	34 16 S0	- - -	- - -	- - -
6	5	0 01 S1	55 26 S4	81 42 S6	43 21 S1	- - -	- - -	- - -	- - -
7	6	- - -	50 24 S4	80 41 S6	53 25 S1	- - -	- - -	- - -	- - -
8	7	- - -	43 22 S4	81 42 S6	63 31 S2	- - -	- - -	- - -	- - -
9	8	- - -	45 23 S4	83 44 S6	65 32 S2	- - -	- - -	- - -	- - -
10	9	- - -	26 19 S3	82 43 S5	66 33 S2	- - -	- - -	- - -	- - -
11	10	- - -	40 22 S3	81 42 S5	- - -	- - -	- - -	- - -	- - -
12	11	- - -	38 22 S3	59 29 S3	- - -	- - -	- - -	- - -	- - -
13	12	- - -	38 22 S3	63 31 S3	- - -	- - -	- - -	- - -	- - -
14	13	- - -	29 20 S3	76 38 S5	35 16 S0	- - -	- - -	- - -	- - -
15	14	- - -	6 12 S1	63 31 S3	94 56 S6	42 20 S0	- - -	- - -	- - -
16	15	- - -	1 06 S0	64 29 S3	90 51 S6	77 40 S3	- - -	- - -	- - -
17	16	- - -	1 06 S0	45 23 S2	87 47 S5	94 57 S6	82 43 S3	77 39 S2	40 19 S0
18	17	- - -	- - -	24 19 S1	85 46 S5	93 54 S6	89 49 S4	68 34 S1	26 11 S0
19	18	- - -	- - -	34 16 S1	76 38 S4	89 50 S5	86 47 S4	61 30 S1	- - -
20	19	- - -	- - -	4 09 S0	79 41 S4	92 53 S6	82 43 S3	80 42 S3	55 26 S0
21	20	- - -	- - -	4 09 S0	80 41 S4	90 50 S5	82 43 S3	78 40 S2	56 27 S0
22	21	- - -	- - -	13 15 S1	82 43 S5	80 41 S4	82 43 S3	75 38 S2	50 24 S0
23	22	- - -	0 01 S0	34 20 S1	85 45 S5	79 41 S4	79 41 S3	68 34 S1	36 17 S0
24	23	- - -	8 13 S1	59 29 S3	89 49 S6	81 42 S4	79 40 S3	61 30 S1	- - -
25	24	- - -	35 21 S2	68 34 S4	91 51 S6	84 45 S5	79 41 S3	54 26 S0	- - -

Image 17. Automatically populated prediction data for Zone 3 from the band-specific data.

As you can see in Image 17, you can make a polishing touch to your prediction by lightly coloring the best opening times to the Zone (the evaluation of the best times has been done manually), as I have done here for Zone 3 (W6). Of course, for the absolutely complete picture, an analysis of grayline maps will still be needed for 80 and 40 Meters and to be marked with light orange color on this same page - but this is a good start!