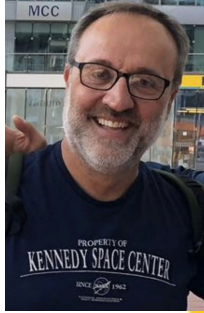


# AMATÖRCE SOHBETLER



**Burcu Aybak Dinc**  
TA2NBA / OH2CAV



**Barbaros Asuroglu**  
WB2CBA

**FISILTİ  
WSPR NEDİR ?**



**Volkan SAMLI**  
TA1DE



**Baris Dinc**  
TA7W / OH2UDS

# Gündem / Konularımız

- WSPR Nedir ?
- WSPR Ne için kullanılıyor ?
- Sinyal neye benziyor, nasıl üretiliyor ?
- WSPR-Net
- Kendi WSPR Vericimizi Yapabilir miyiz ?
- Barbaros Aşuroğlu uygulamaları ve hikayeleri (WB2CBA)
  - WSPR
  - uSDX, uSDX MoNo, uSDX SOTA
  - ADX

# WSPR Nedir ? **WhiSPeR** (FISILTI) diye okunur

**2008**

**W** : Weak (Zayıf)

**S** : Signal (Sinyal)

**P** : Propagation (Propagasyon)

**R** : Reporter (Raporlayıcısı)

WSJT (Weak Signal Joe Taylor)

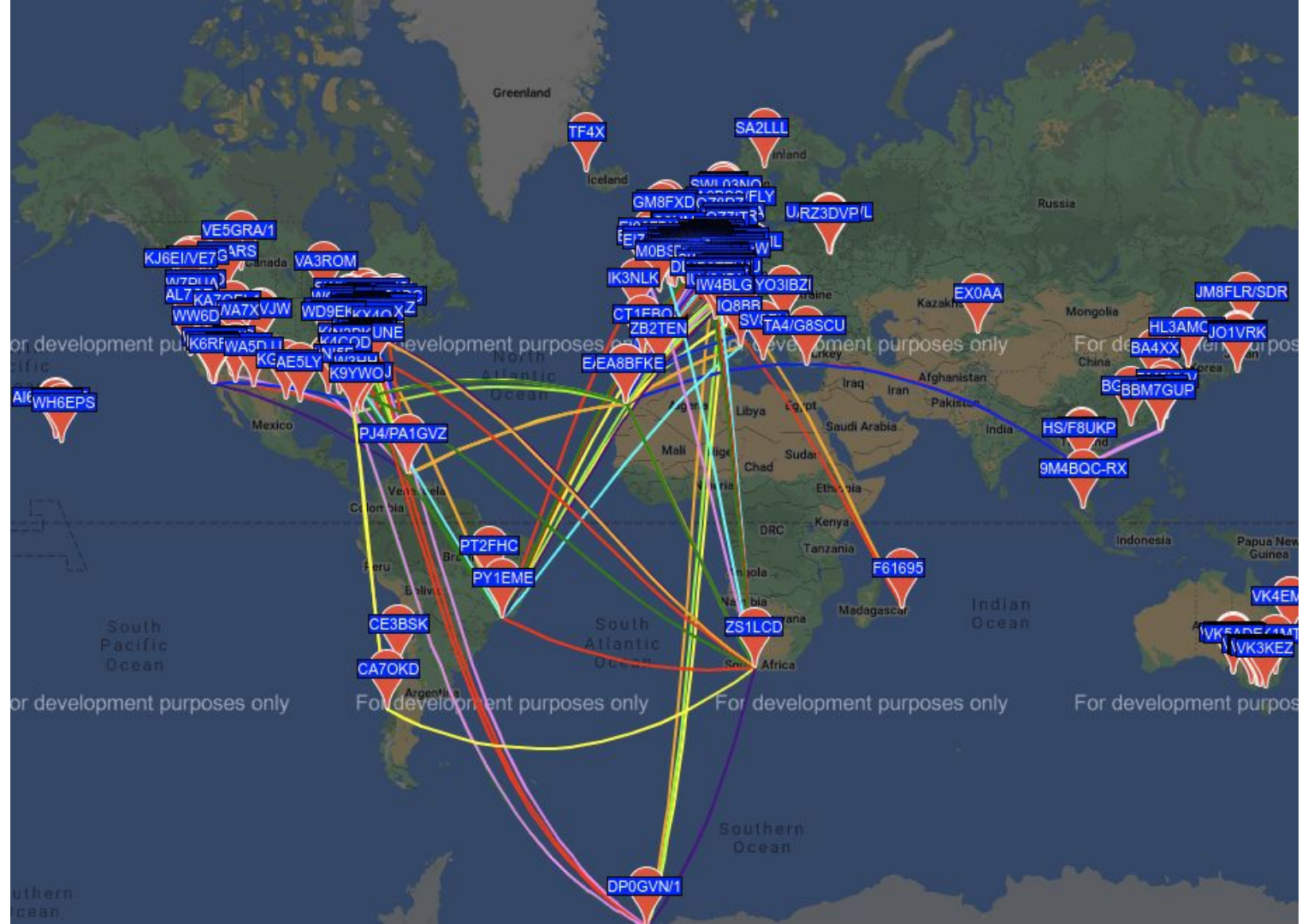
- FSK441 (2001)
- JT6M / JT65 / JT9
- FT4 / FT8 (2017)



K1JT Joe Taylor  
Nobel Ödüllü Astrofizikçi

**İhtiyaç** : HF için bir propagasyon haritası çıkarmak

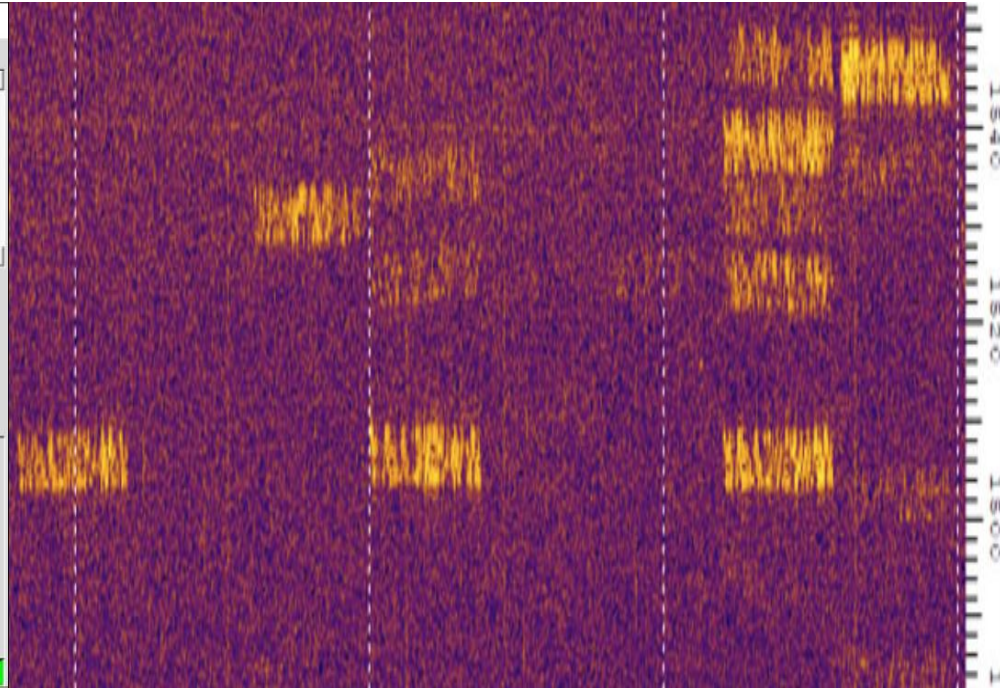
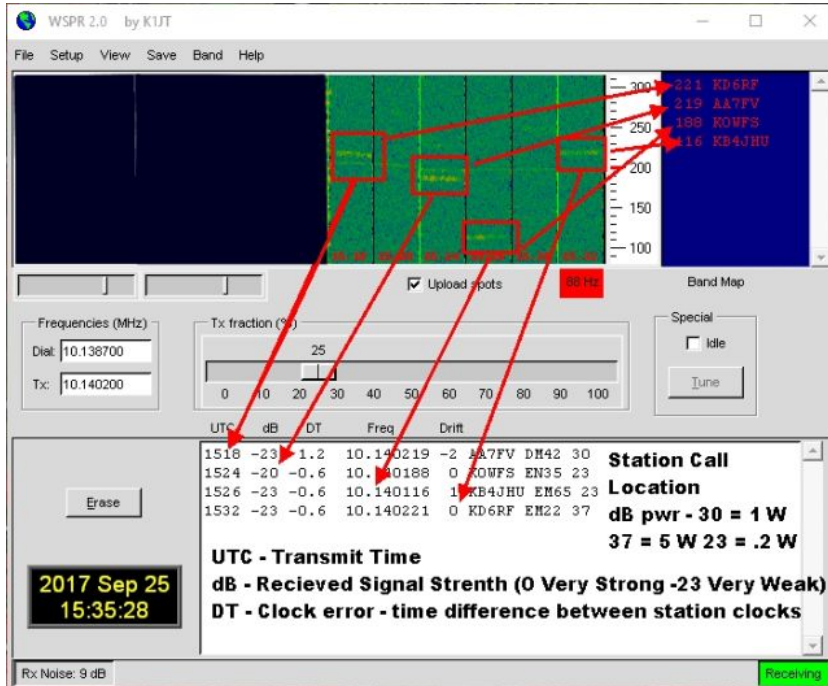
**Çözüm** : düşük güçlü WSPR vericileri (beaconları)





# Nasıl Gönderiyor

- 4 FSK (Frequency Shift Keying), 1.4648 Hz ton aralığı
- 6 Hz band genişliği kaplar
- Çift dakikaların 1. Saniyesinde gönderim başlar (00:02:01)
- 110.6 saniye sürer



# Ne Gönderiyor (Protokol İçeriği)

ÇAĞRI İŞARETİ

- + LOCATOR
- + dBm cinsinden verici gücü

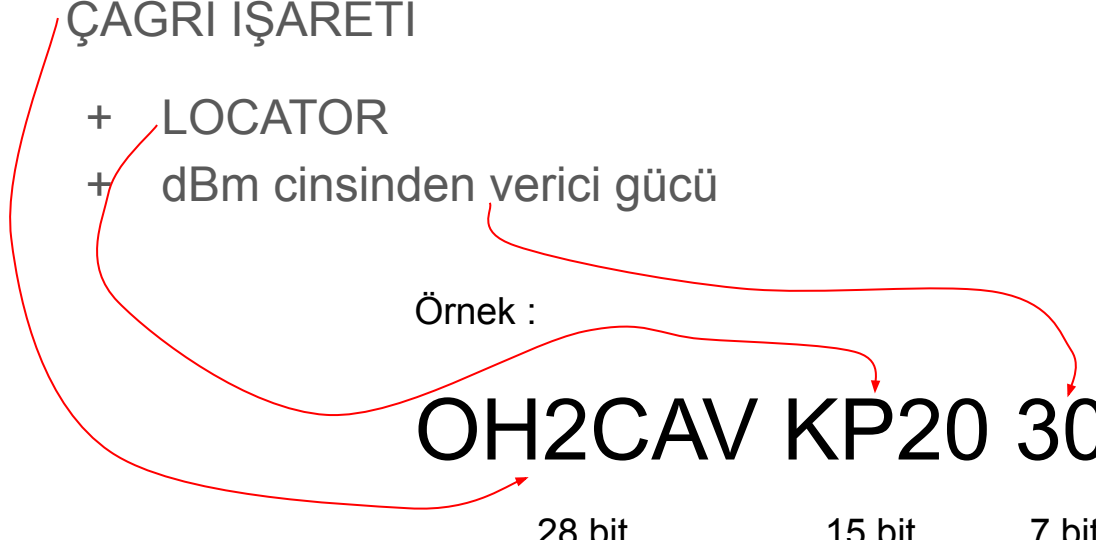
Örnek :

OH2CAV KP20 30

28 bit

15 bit

7 bit = Toplam 50 bit

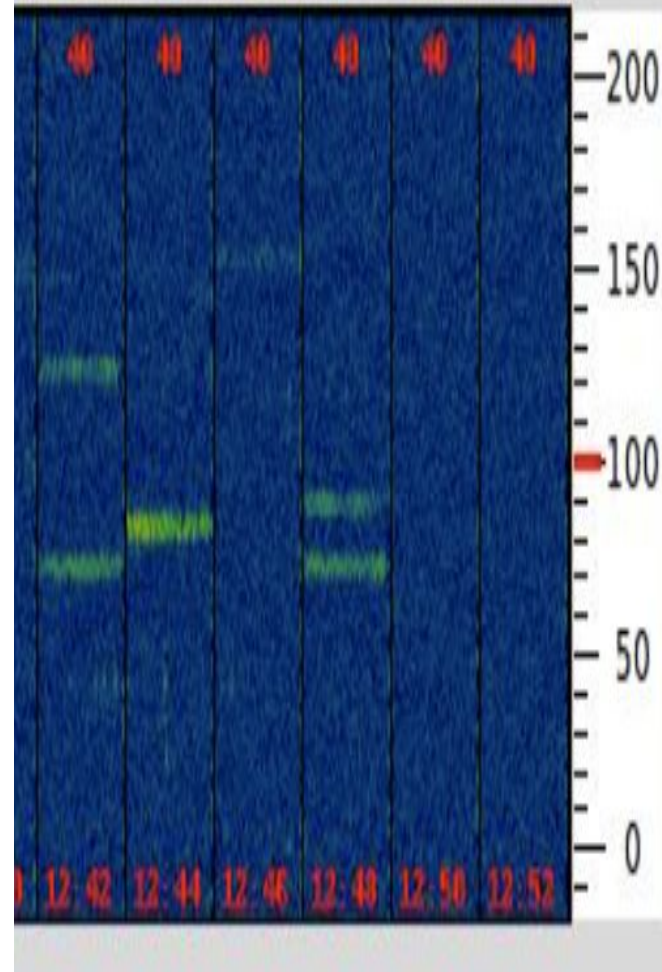
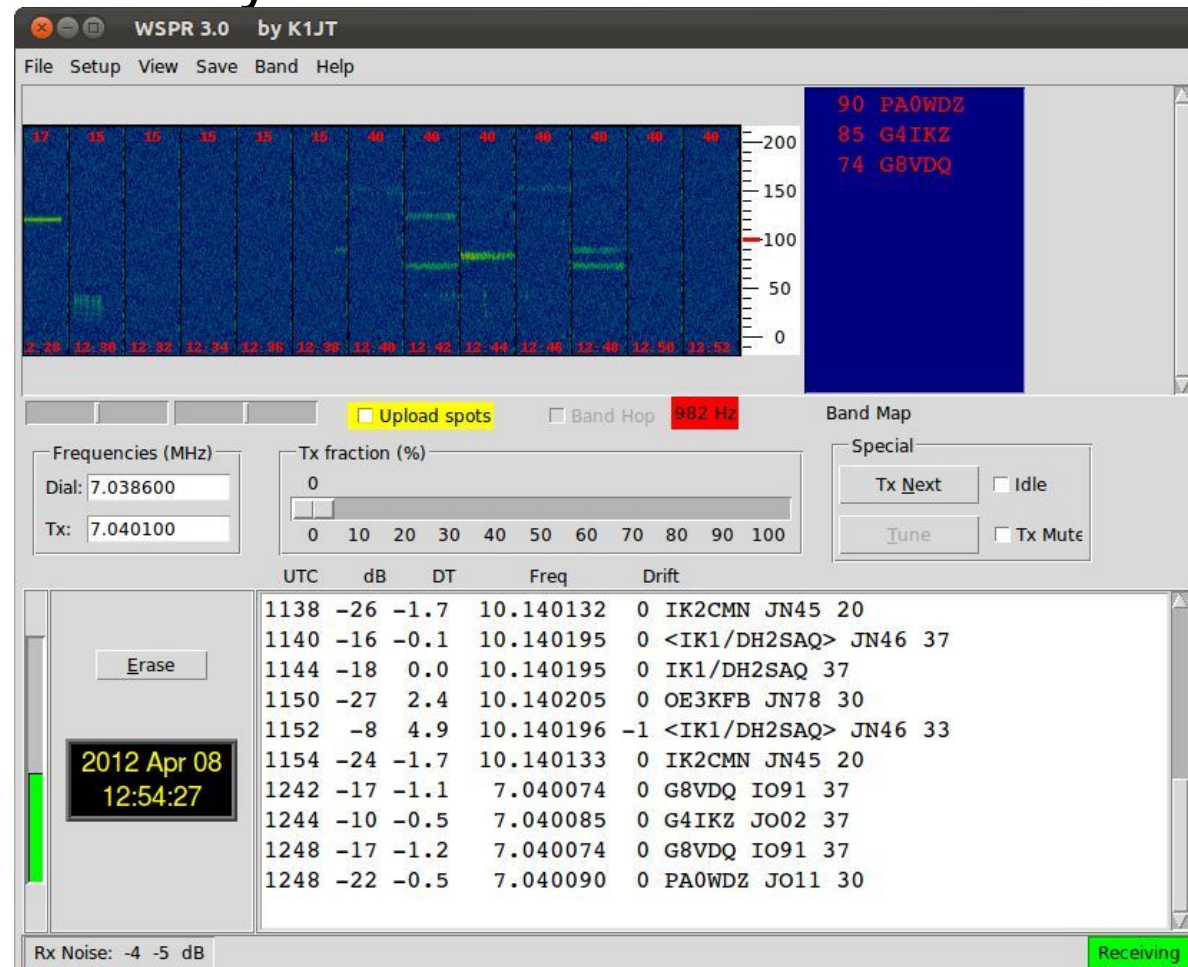


# WSPR Frekanslari

-----Band-----Dial Frequency-----TX Frequency center(+range)-----

- 2190m-----0.136000-----0.137500 (+- 100Hz)
- 630m-----0.474200-----0.475700 (+- 100Hz)
- 160m-----1.836600-----1.838100 (+- 100Hz)
- 80m-----3.568600-----3.570100 (+- 100Hz) (this is the default frequency in WSJT-X v1.8.0 to be within the Japanese allocation.)
- 80m-----3.592600-----3.594100 (+- 100Hz) (No TX allowed for Japan; [http://www.jarl.org/English/6\\_Band\\_Plan/JapaneseAmateurBandplans20150105...](http://www.jarl.org/English/6_Band_Plan/JapaneseAmateurBandplans20150105...))
- 60m-----5.287200-----5.288700 (+- 100Hz) (please check local band plan if you're allowed to operate on this frequency!)
- 60m-----5.364700-----5.366200 (+- 100Hz) (valid for 60m band in Germany or other EU countries, check local band plan prior TX!)
- 40m-----7.038600-----7.040100 (+- 100Hz)
- 30m-----10.138700-----10.140200 (+- 100Hz)
- 20m-----14.095600-----14.097100 (+- 100Hz)
- 17m-----18.104600-----18.106100 (+- 100Hz)
- 15m-----21.094600-----21.096100 (+- 100Hz)
- 12m-----24.924600-----24.926100 (+- 100Hz)
- 10m-----28.124600-----28.126100 (+- 100Hz)
- 6m-----50.293000-----50.294500 (+- 100Hz)
- 4m-----70.091000-----70.092500 (+- 100Hz)
- 2m-----144.489000-----144.490500 (+- 100Hz)
- 70cm-----432.300000-----432.301500 (+- 100Hz)
- 23cm-----1296.500000-----1296.501500 (+- 100Hz)

# WSPR yazılımı





# Spektrum Görünümü



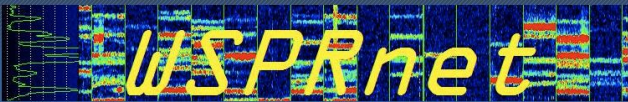
Dikkat : Şekilde gösterilen bir FT-8 Waterfall görünümüdür

Neden WSPR ?

## Weak-Signal S/N Limits

<u>Mode</u>	<u>(B = 2500 Hz)</u>
SSB	~+10 dB
MSK144	- 8
CW, "ear-and-brain"	-15
FT8	-21
JT4	-23
JT65	-25
JT9	-27
QRA64	-27
WSPR	-31

# WSPR-NET (<https://www.wsprnet.org/>)



**WSPRnet**  
Welcome to the Weak Signal Propagation Reporter Network

[Activity](#) | [Map](#) | [Database](#) | [Forum](#) | [Downloads](#)

**User login**

Username \*

Password \*

Create new account  
Request new password

Log In

**Frequencies**

USB dial (MHz): 0.136, 0.4742, 1.8366, 3.5696, 5.2872, 5.3647, 7.0396, 10.1387, 13.5539, 14.0956, 18.1046, 21.0946, 24.9246, 28.1246, 50.293, 70.091, 144.489, 432.300, 1296.500

**Navigation**

Forums

**3rd Party Maps and Data**

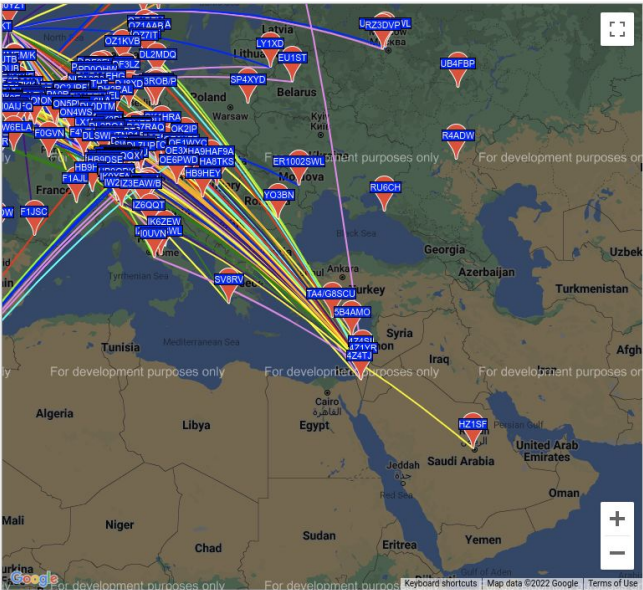
VK7JJ Site  
M0XDK Map  
K89AMG Monthly Stats  
WIA2ZKD Spot Analysis  
DJ2LS WSPR Spot Heat Map  
LU7AA/LU7ABF Maps/Graphs (slow load)

**Who's online**

There are currently 69 users online.

- sq9nrf
- SM6OES
- G4PCI
- IW2FVO
- KD4MZM
- G0UCD
- N5XXN

**Map**



Update

Band  
20m

Show only spots on this band.

Maximum number of spots limit has been reached (500). Not all spots for the form limits have been returned

[Keyboard shortcuts](#) | [Map data ©2022 Google](#) | [Terms of Use](#)

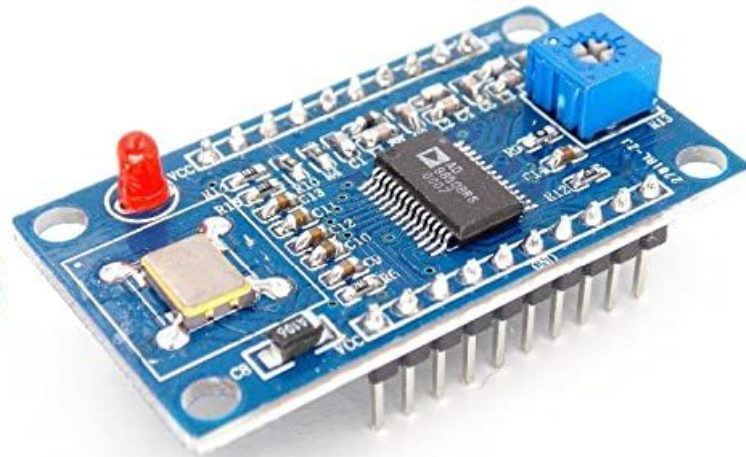
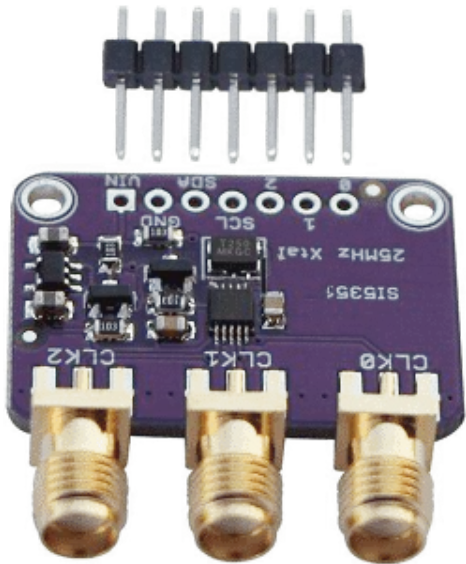


# Kendi WSPR Vericimizi Yapabilir miyiz ?

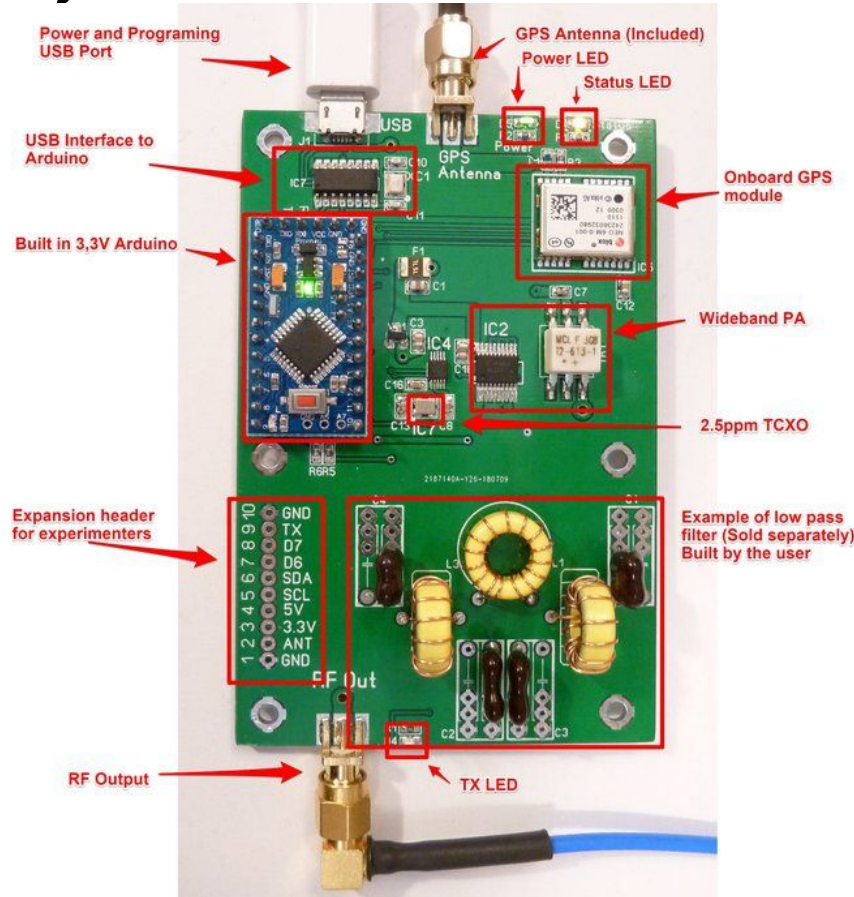
Neye ihtiyacımız var :

- Zaman !!!
- Verici (Frekansı Hz seviyesinde değiştirebildiğimiz kararlı bir Osilatör)
- Güçlendirici (Opsiyonel)

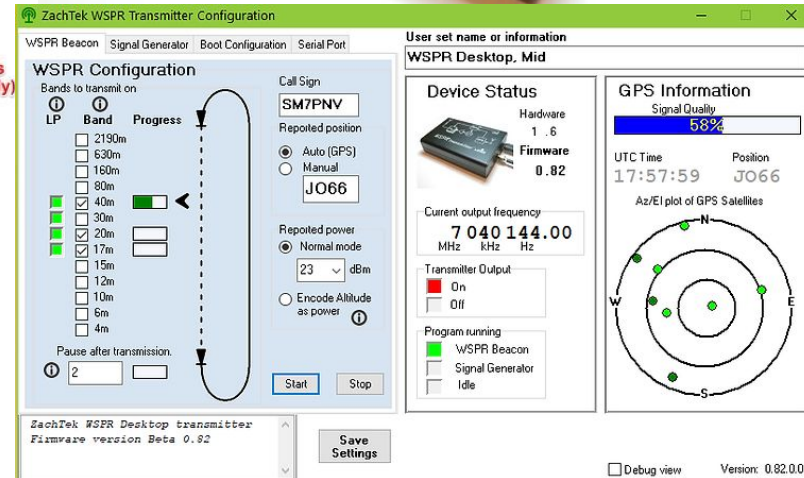
**ZAMAN ?**



# Örnek Projeler 1 (<https://antrak.org.tr/haberler/antrak-wspr/>)

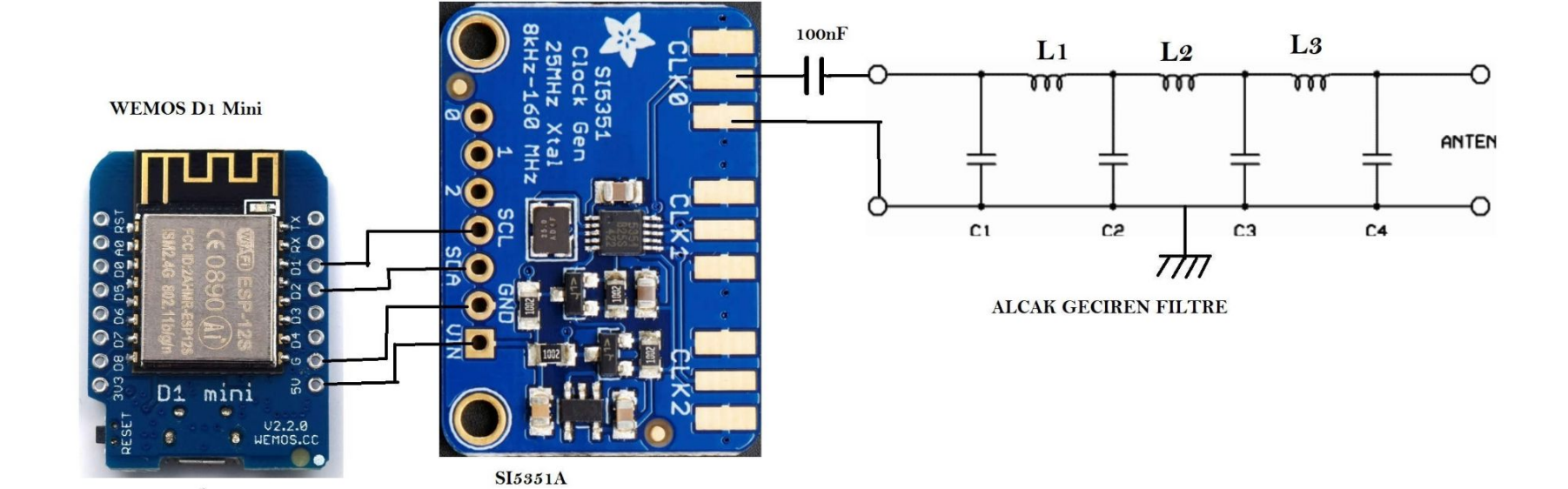


WSPR-TX LP1





# Örnek Projeler 2 (<https://antrak.org.tr/blog/basit-ve-ucuz-esp-wspr-vericisi/>)

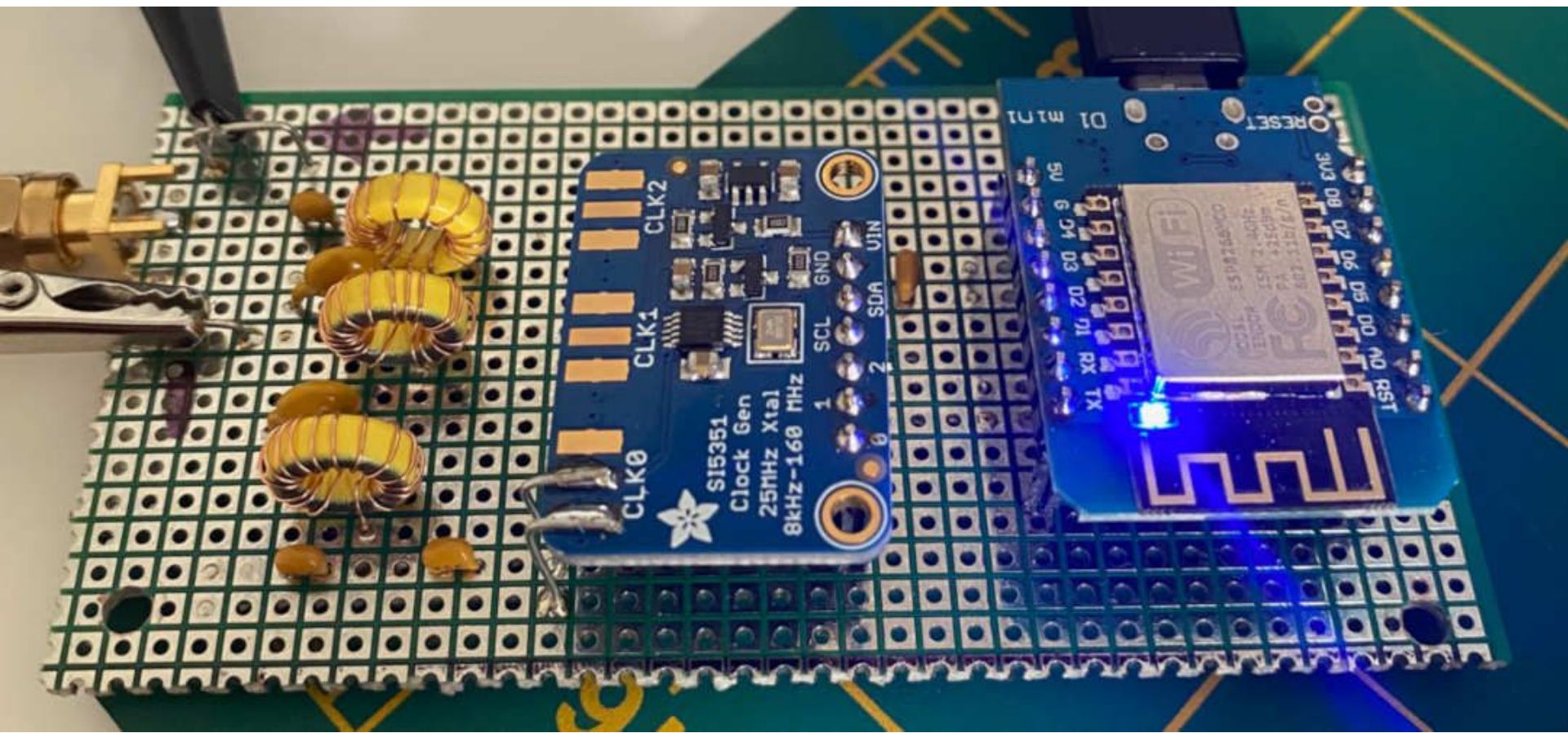


Mikro USB Soketi

Band	C1	C2	C3	C4	L1 ve L3 Tur	L2 TUR	Toroid tipi
20 m/14 mhz bandi için	180 pF	390 pF	390 pF	180 pF	16 (773nH)	17 (904nH)	T37-6 (SARI boyali Toroid)

ESP WSPR SEMASI - WB2CBA

Haydi Yapalım



# Nasıl Çalışıyor ?

- Wifi ağına bağlanır
- İnternet zaman sunucusuna bağlanıp

zaman eşlemesi yapar

- Çift dakikaları bekler
- Kullanıcının çağrı adı

+ Lokatör

+ Çıkış gücünden

oluşturduğu paketi WSPR protokolüne göre kodlar ve

sinyal göndereceği frekansları belirler

- Si5351 belirlenen frekansta taşıyıcı gönderir (FSK)
- 110.6 saniye boyunca gönderime devam eder

Timestamp	Call	MHz	SNR	Drift	Grid	Pwr	Reporter	RGrid	km	az	Mode
2022-04-13 15:12	YM2KA	14.097076	-27	-2	KM69	0.01	EU1ST	KO33bu	1648	348	2
2022-04-13 15:08	YM2KA	14.097068	-22	-3	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 15:08	YM2KA	14.097076	-25	0	KM69	0.01	DK6UG	JN49cm	2243	308	2
2022-04-13 15:08	YM2KA	14.097075	-22	-2	KM69	0.01	DL2MDQ	JO64qb	2189	324	2
2022-04-13 15:04	YM2KA	14.097068	-24	-1	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 15:00	YM2KA	14.097068	-25	-4	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 15:00	YM2KA	14.097076	-24	-1	KM69	0.01	DK6UG	JN49cm	2243	308	2
2022-04-13 15:00	YM2KA	14.097114	-15	-1	KM69	0.01	4Z4TJ	KM71jf	932	169	2
2022-04-13 14:56	YM2KA	14.097068	-23	0	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 14:52	YM2KA	14.097068	-25	-2	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 14:48	YM2KA	14.097089	-24	0	KM69	0.01	DK8NA	JN59mr	2064	311	2
2022-04-13 14:48	YM2KA	14.097075	-27	-2	KM69	0.01	DL2MDQ	JO64qb	2189	324	2
2022-04-13 14:44	YM2KA	14.097077	-25	-3	KM69	0.01	DK6UG	JN49cm	2243	308	2
2022-04-13 14:40	YM2KA	14.097059	-27	0	KM69	0.01	HA9HAF9A	JN97mp	1439	314	2
2022-04-13 14:36	YM2KA	14.097069	-26	0	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 14:36	YM2KA	14.097116	-23	-1	KM69	0.01	4Z4TJ	KM71jf	932	169	2
2022-04-13 14:32	YM2KA	14.097076	-25	-1	KM69	0.01	OE9HLH	JN47um	2067	303	2
2022-04-13 14:28	YM2KA	14.097116	-26	-3	KM69	0.01	4Z4TJ	KM71jf	932	169	2
2022-04-13 14:28	YM2KA	14.097069	-27	-1	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 14:28	YM2KA	14.097060	-24	-3	KM69	0.01	HA9HAF9A	JN97mp	1439	314	2
2022-04-13 14:24	YM2KA	14.097077	-21	-1	KM69	0.01	DK6UG	JN49cm	2243	308	2
2022-04-13 14:24	YM2KA	14.097090	-22	0	KM69	0.01	LX1DQ	JN39cq	2385	307	2
2022-04-13 14:08	YM2KA	14.097073	-23	0	KM69	0.01	EU1ST	KO33bu	1648	348	2
2022-04-13 14:08	YM2KA	14.097063	-27	0	KM69	0.01	HA9HAF9A	JN97mp	1439	314	2
2022-04-13 14:04	YM2KA	14.097112	-23	-1	KM69	0.01	4Z4TJ	KM71jf	932	169	2
2022-04-13 14:04	YM2KA	14.097066	-25	-3	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 13:56	YM2KA	14.097066	-24	-3	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 13:52	YM2KA	14.097113	-20	-1	KM69	0.01	4Z4TJ	KM71jf	932	169	2
2022-04-13 13:52	YM2KA	14.097066	-22	1	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 13:52	YM2KA	14.097070	-26	-1	KM69	0.01	PI4THT	JO32kf	2446	314	2
2022-04-13 13:48	YM2KA	14.097112	-28	0	KM69	0.01	4Z4TJ	KM71jf	932	169	2
2022-04-13 13:44	YM2KA	14.097066	-22	0	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 13:40	YM2KA	14.097113	-28	-2	KM69	0.01	4Z4TJ	KM71jf	932	169	2
2022-04-13 13:36	YM2KA	14.097066	-25	0	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 13:36	YM2KA	14.097113	-26	-2	KM69	0.01	4Z4TJ	KM71jf	932	169	2
2022-04-13 13:28	YM2KA	14.097065	-22	0	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 13:20	YM2KA	14.097064	-21	-1	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 13:12	YM2KA	14.097073	-26	0	KM69	0.01	OE9GHV	JN47wk	2052	303	2
2022-04-13 13:12	YM2KA	14.097063	-24	-4	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 12:56	YM2KA	14.097062	-19	-1	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 12:44	YM2KA	14.097062	-28	0	KM69	0.01	DL0PF	JN68rn	1849	309	2
2022-04-13 12:36	YM2KA	14.097109	-26	-1	KM69	0.01	4Z4TJ	KM71jf	932	169	2
2022-04-13 11:28	YM2KA	14.097082	-22	-2	KM69	0.01	4L0G	LN21mr	1049	72	2
2022-04-13 10:28	YM2KA	14.097075	-20	0	KM69	0.01	ER1002SWL	KN46dw	911	337	2
2022-04-13 10:20	YM2KA	14.097075	-15	-1	KM69	0.01	ER1002SWL	KN46dw	911	337	2
2022-04-13 10:08	YM2KA	14.097074	-18	-3	KM69	0.01	ER1002SWL	KN46dw	911	337	2
2022-04-13 10:04	YM2KA	14.097073	-15	0	KM69	0.01	ER1002SWL	KN46dw	911	337	2
2022-04-13 10:00	YM2KA	14.097073	-18	-2	KM69	0.01	ER1002SWL	KN46dw	911	337	2
2022-04-13 09:48	YM2KA	14.097071	-16	-2	KM69	0.01	ER1002SWL	KN46dw	911	337	2
2022-04-13 09:48	YM2KA	14.097037	-26	0	KM69	0.01	HA9HAF9A	JN97mp	1439	314	2



# Barbaros Aşuroğlu Projeleri (WB2CBA)



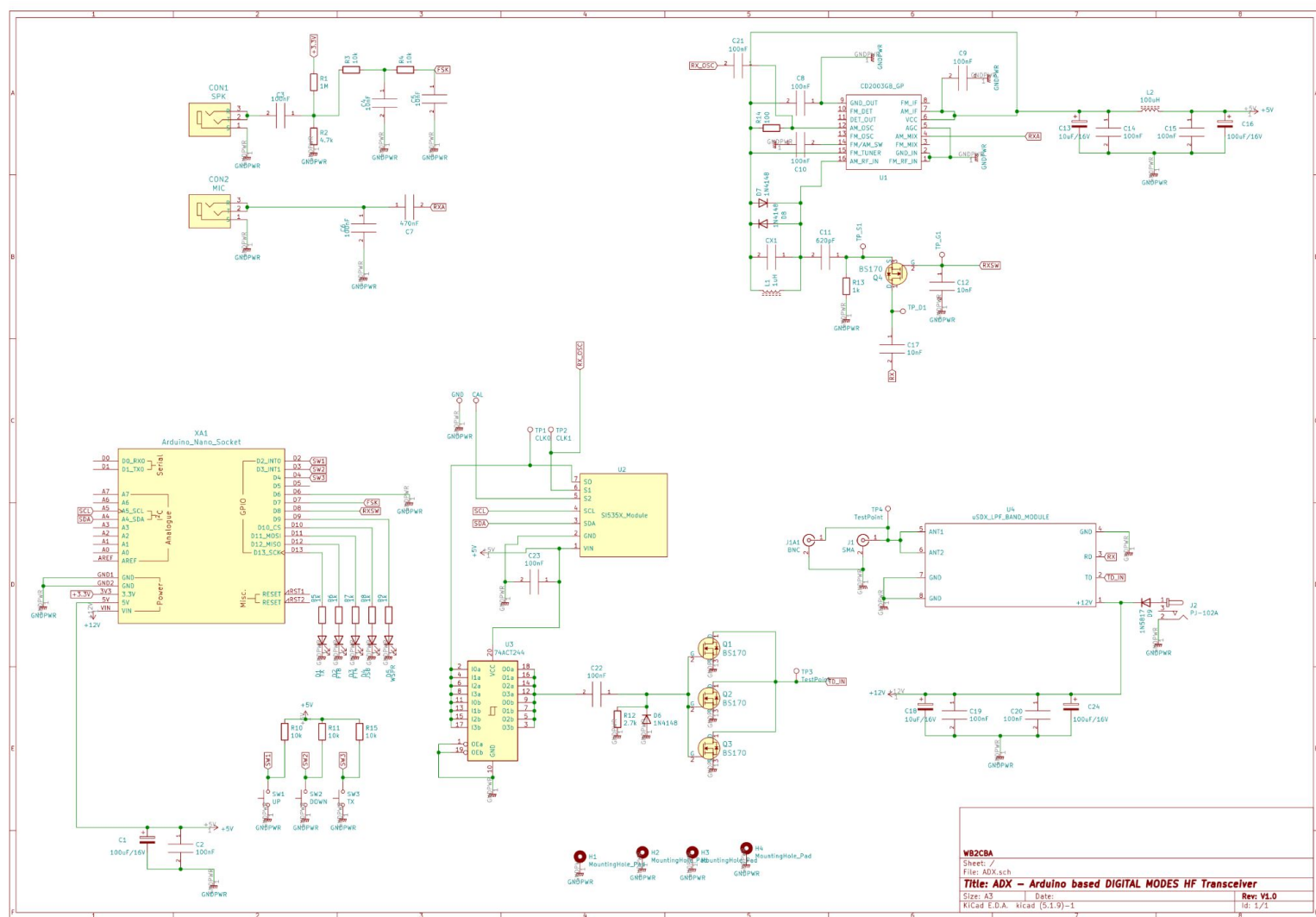
uSDX



ADX

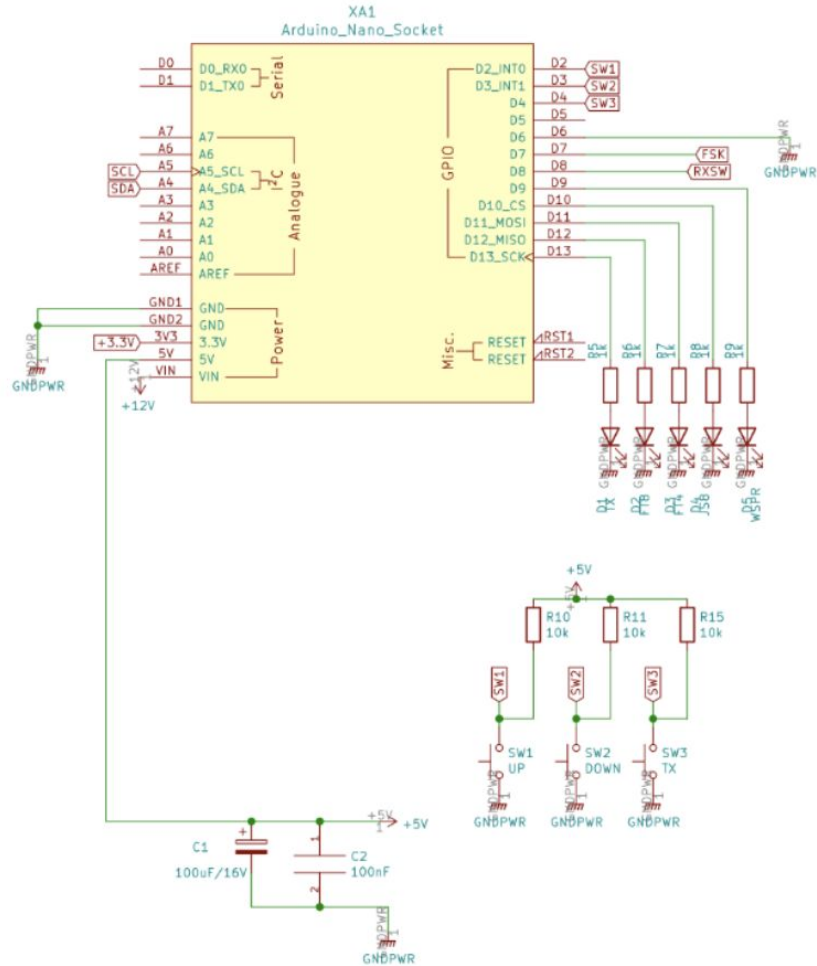


# ADX

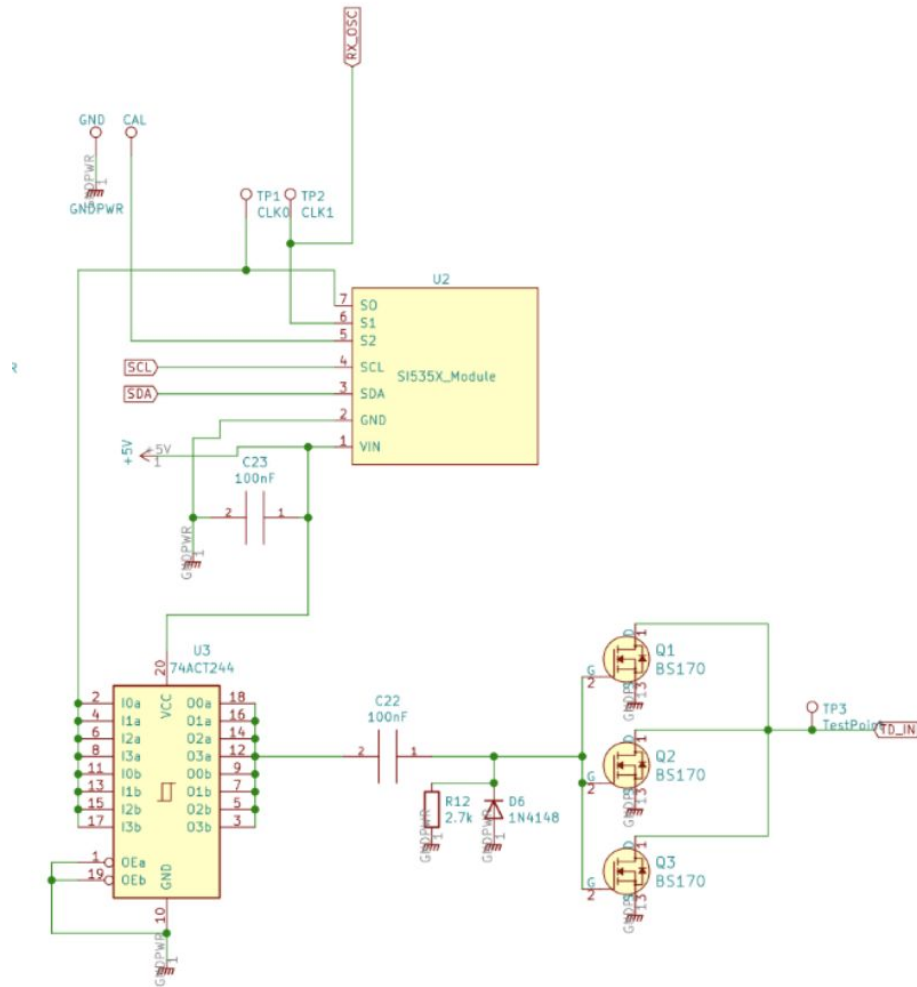




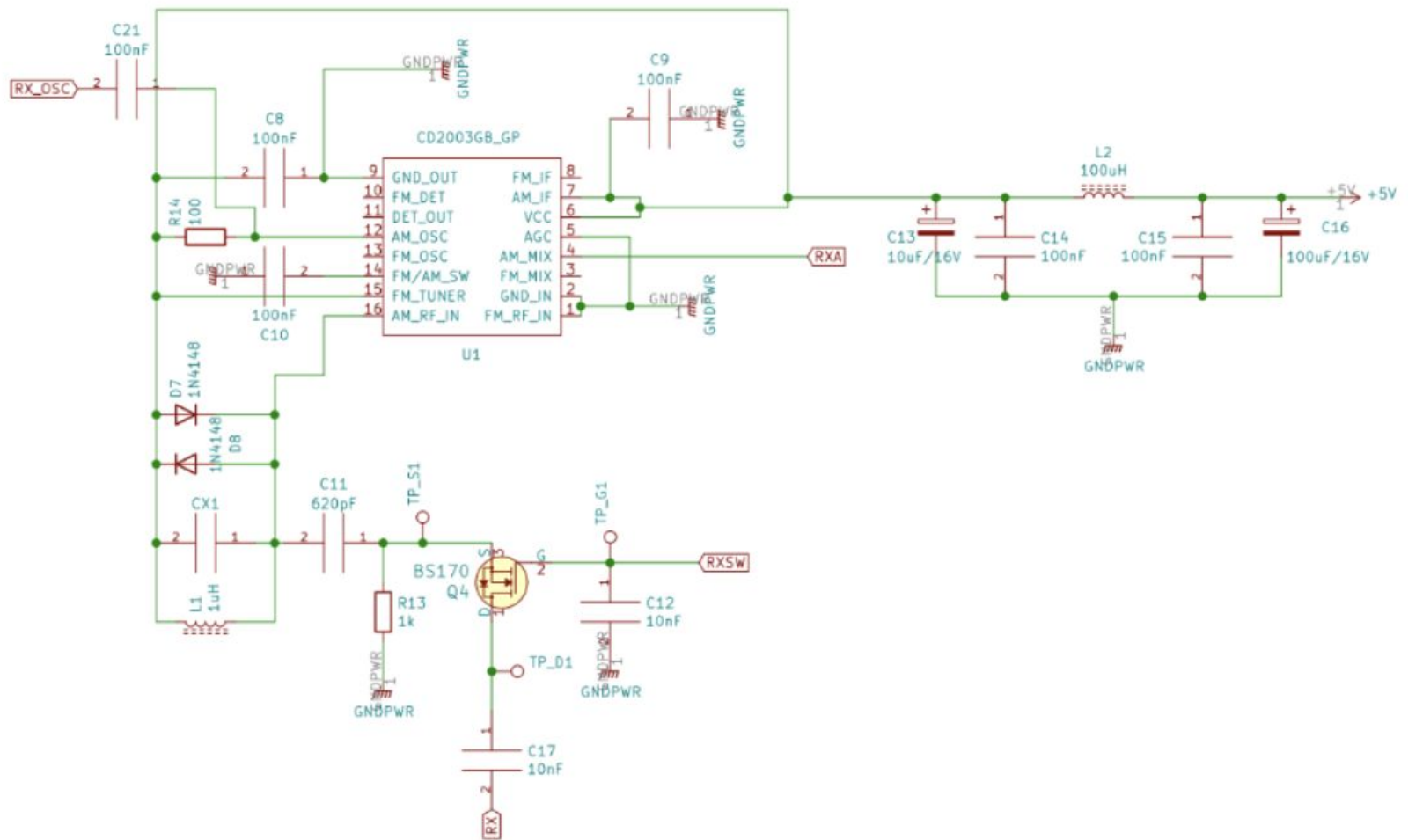
# ADX



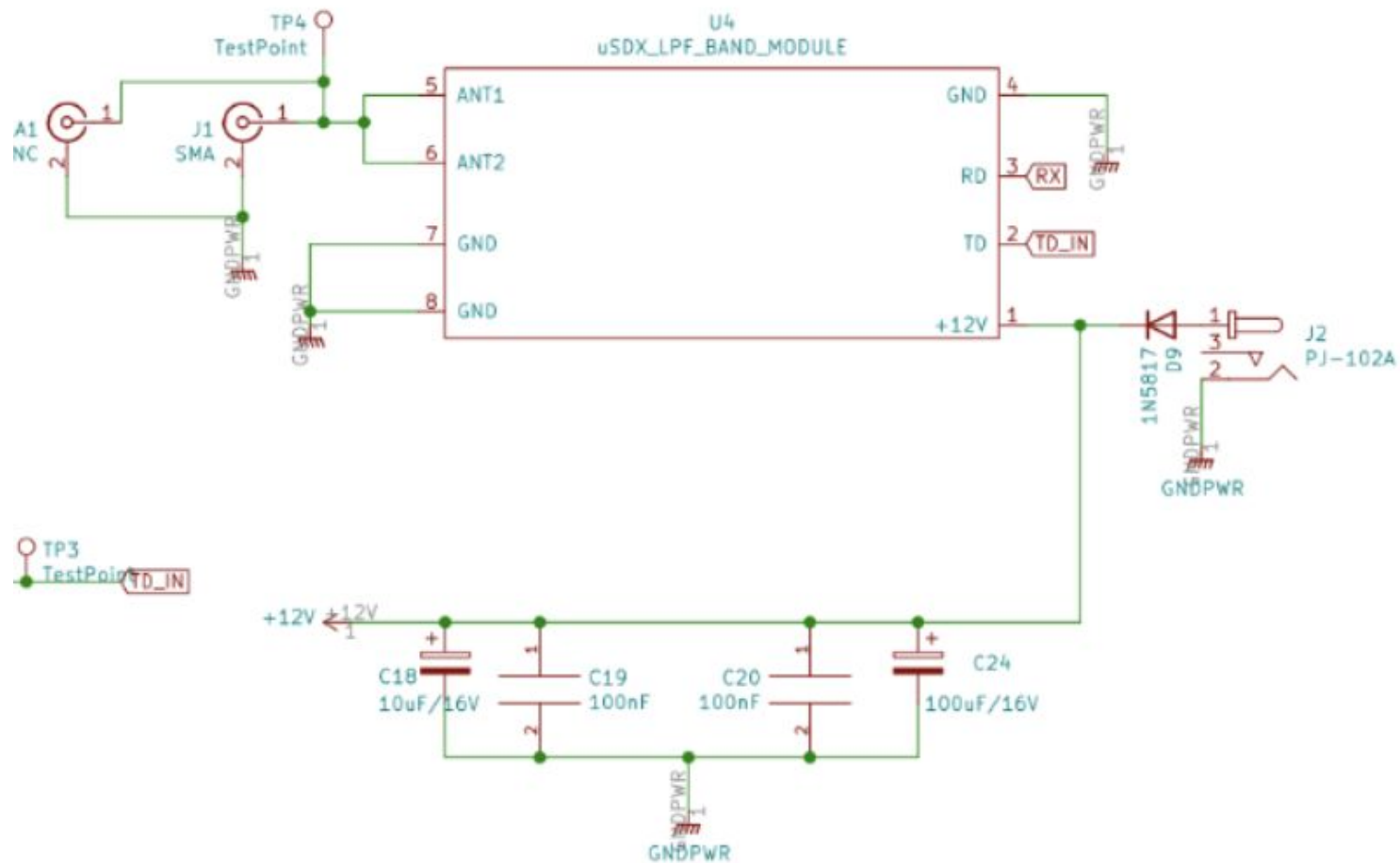
GNDPWR



# ADX



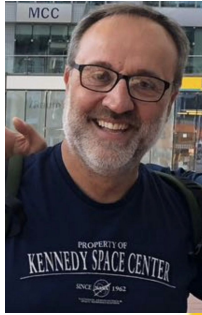
# ADX



# AMATÖRCE SOHBETLER



**Burcu Aybak Dinc**  
TA2NBA / OH2CAV



**Barbaros Asuroglu**  
WB2CBA

## TEŞEKKÜRLER



**Volkan SAMLI**  
TA1DE



**Baris Dinc**  
TA7W / OH2UDS