TELEKOMUNIKACJA

Przewodowa

Elektryczna

Optyczna

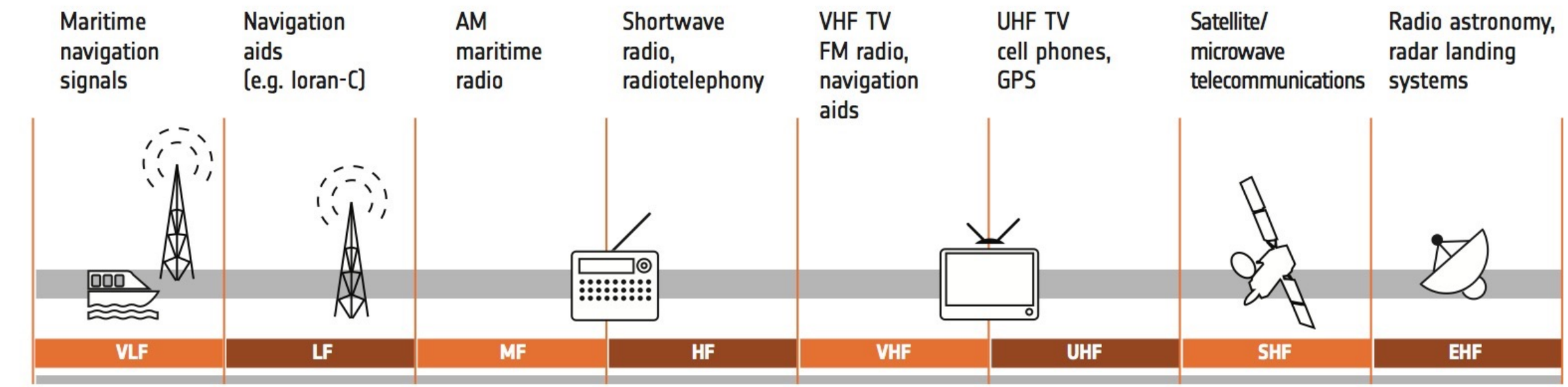
Bezprzewodowa

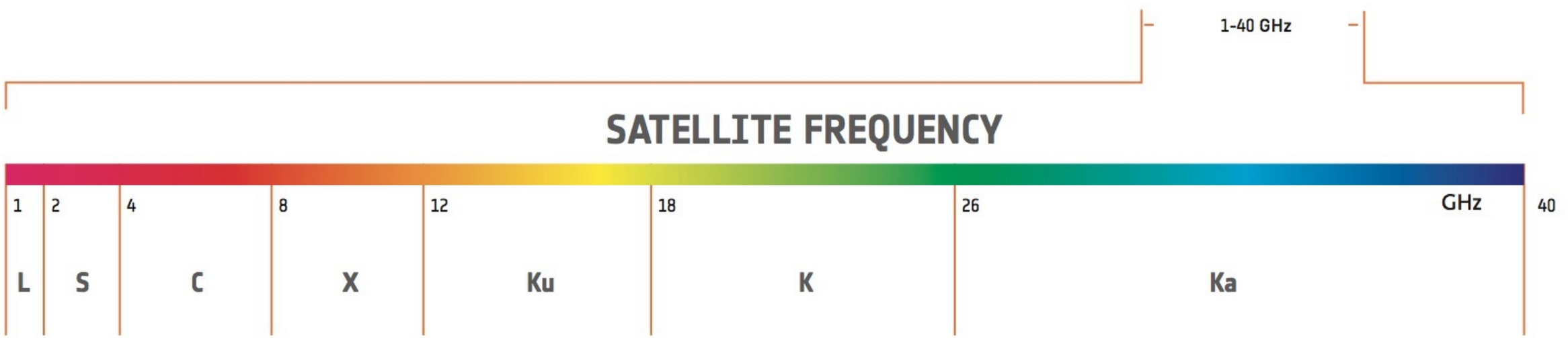
Optyczna

Radiowa

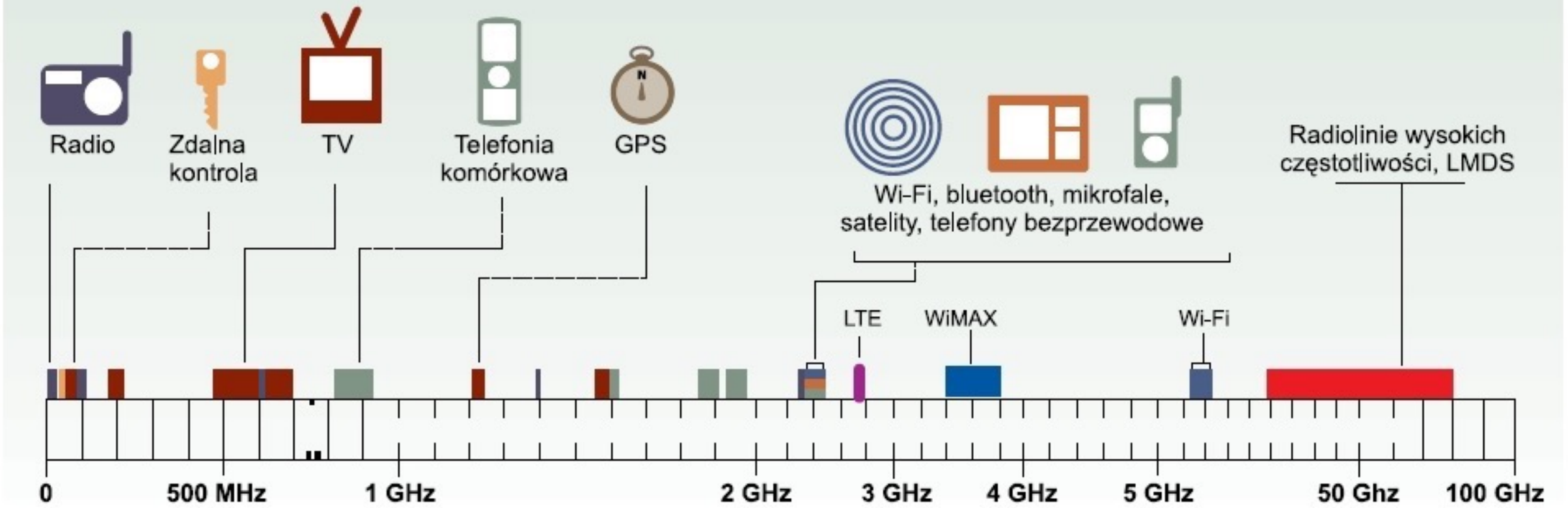
RADIOKOMUNIKACJA

Zakresy radiowe





Popularne technologie wykorzystujące różne zakresy częstotliwości radiowych



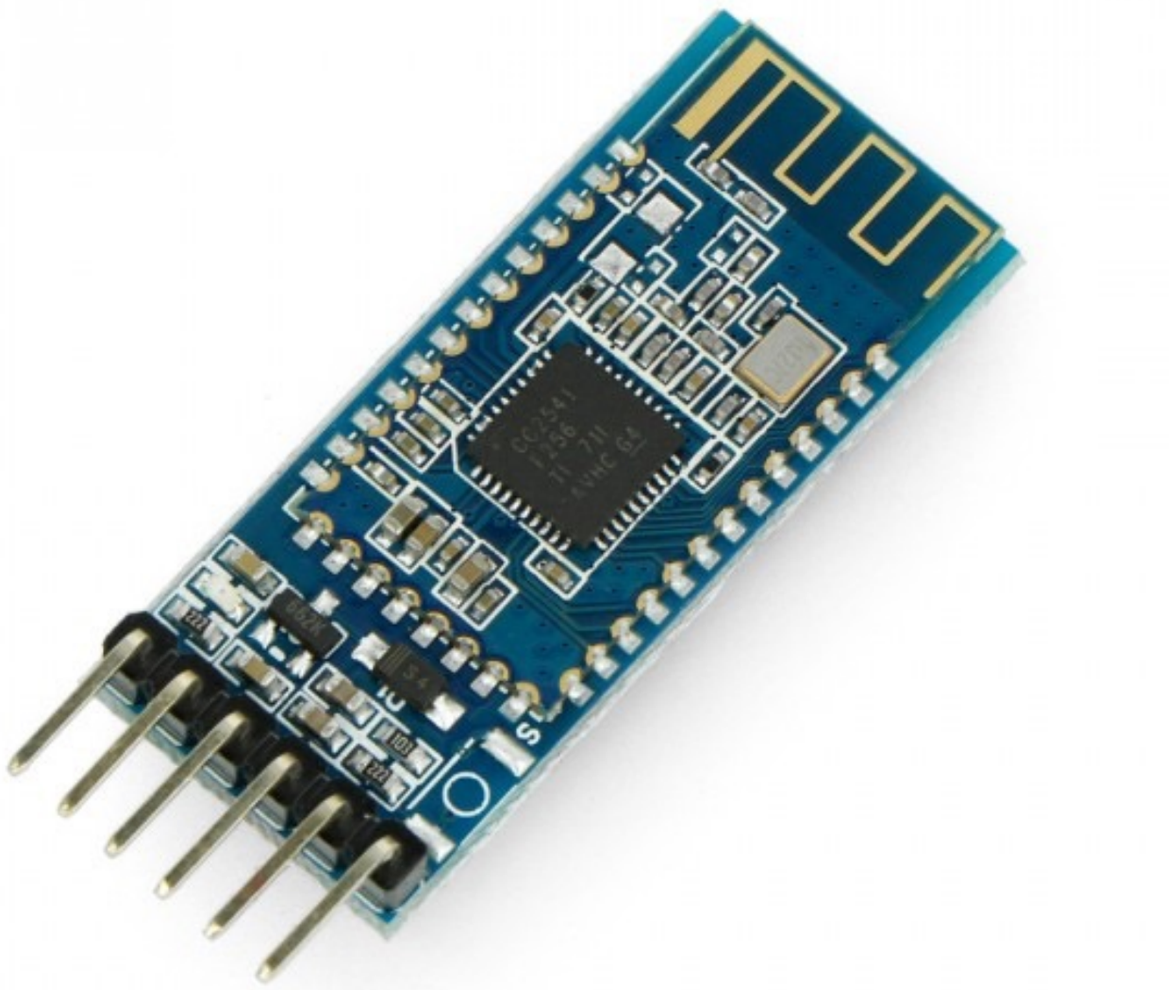
Pasmo ISM (Industrial-Scientific-Medical)

Przedziały częstotliwości ISM akceptowanych na terenie Polski

Od	Do
6,765 MHz	6,795 MHz
13,553 MHz	13,567 MHz
26,957 MHz	27,283 MHz
40,660 MHz	40,700 MHz
433,050 MHz	434,790 MHz
868,000 MHz	870,000 MHz
2400 MHz	2483 MHz
5725 MHz	5875 MHz
24,00 GHz	24,25 GHz
61,00 GHz	61,50 GHz
122,00 GHz	123,00 GHz
244,00 GHz	246,00 GHz

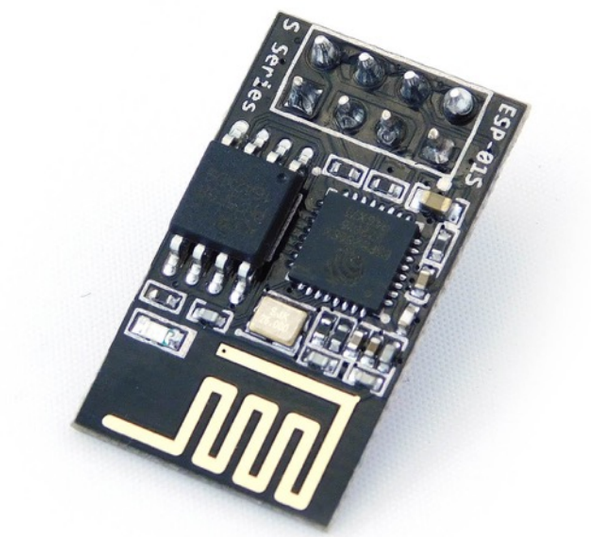
Bluetooth

2,4 GHz



WiFi

2,4 GHz

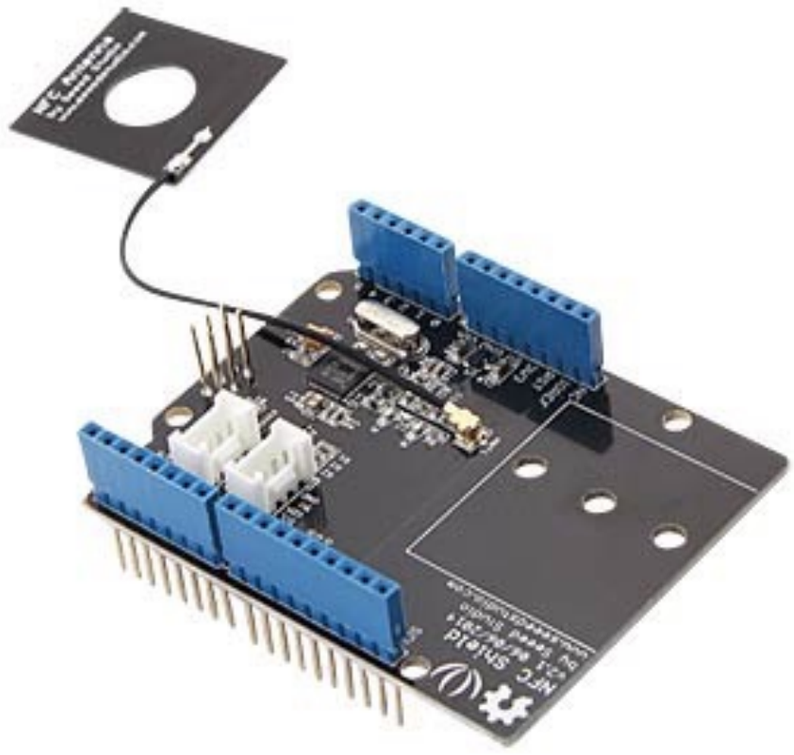

ESP-01S


sparkfun
Photon
RedBoard


PWR
GND
VCC
RX
TX
LED2
SC
RESET
LED1
seeed
Name: W600 Module
ISM 2.4GHz 802.11b/g/n
FCC ID: Z4T-W600MODULE

NFC (Near-Field Communication)

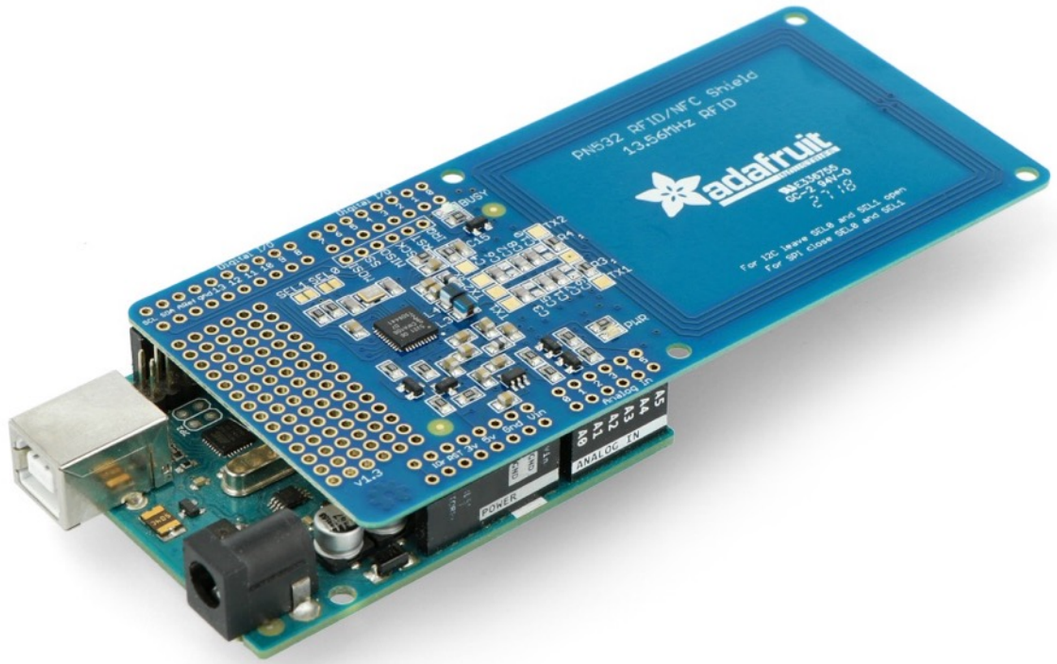
13,56 MHz ± 7 kHz

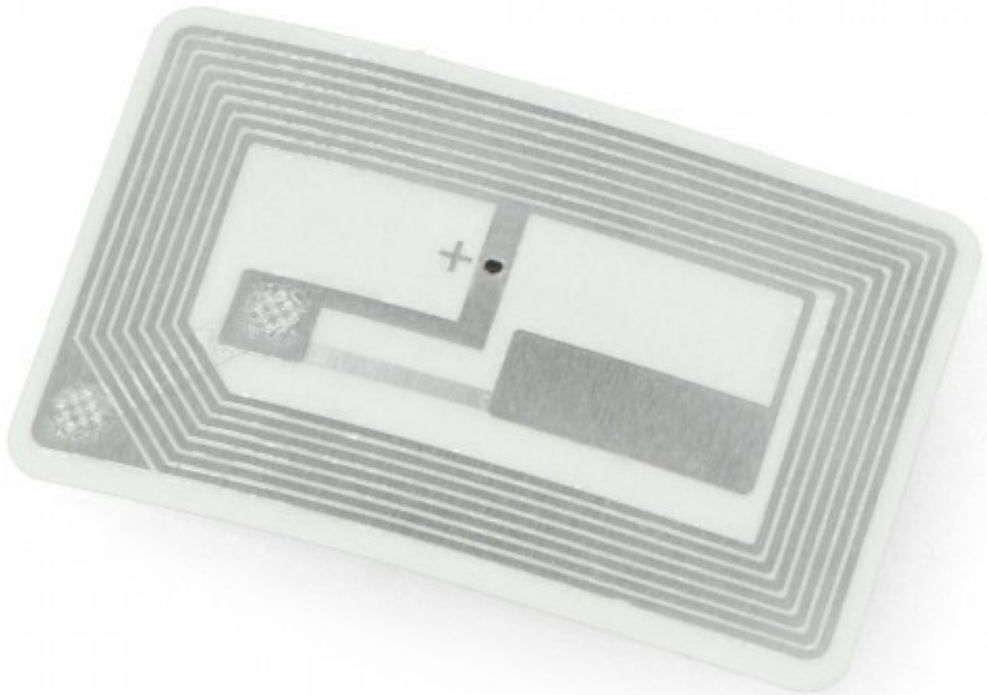


RFID (RADIO FREQUENCY IDENTIFICATION)

13,56 MHz

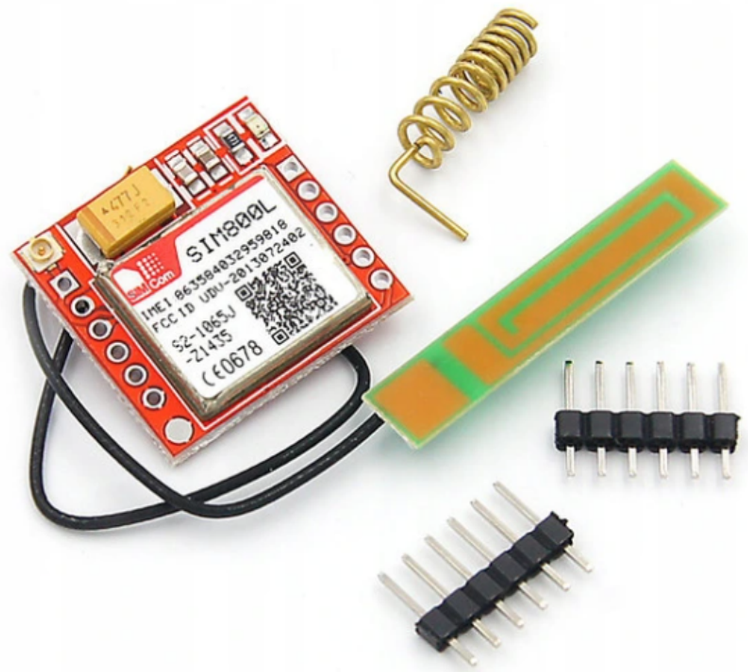
125 kHz



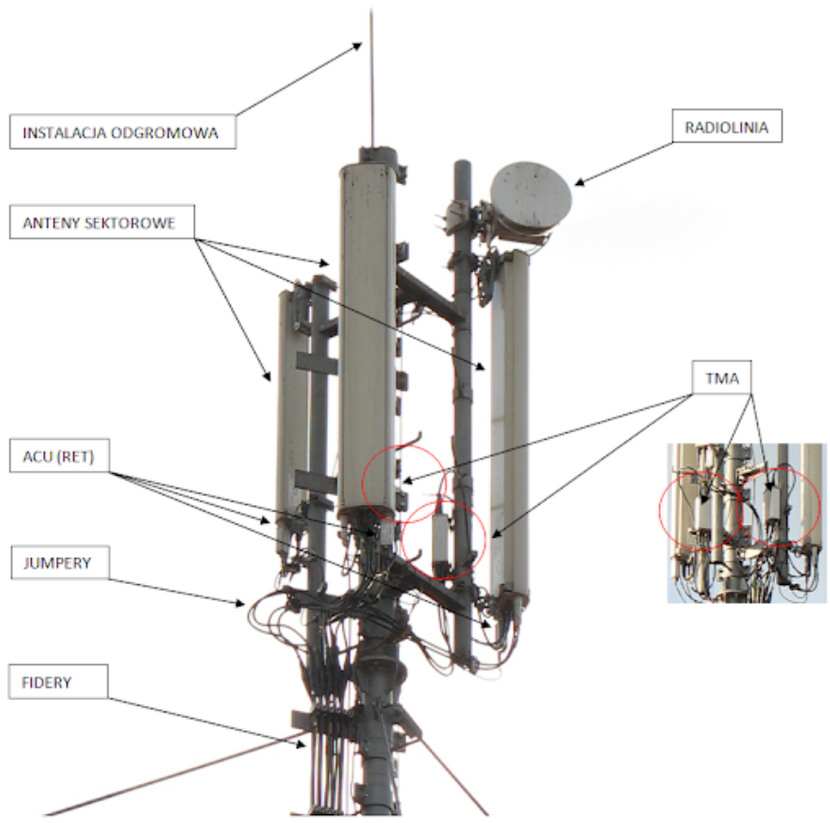


GSM (Groupe Spécial Mobile)

400 / 850 / 900 / 1800 / 1900 MHz

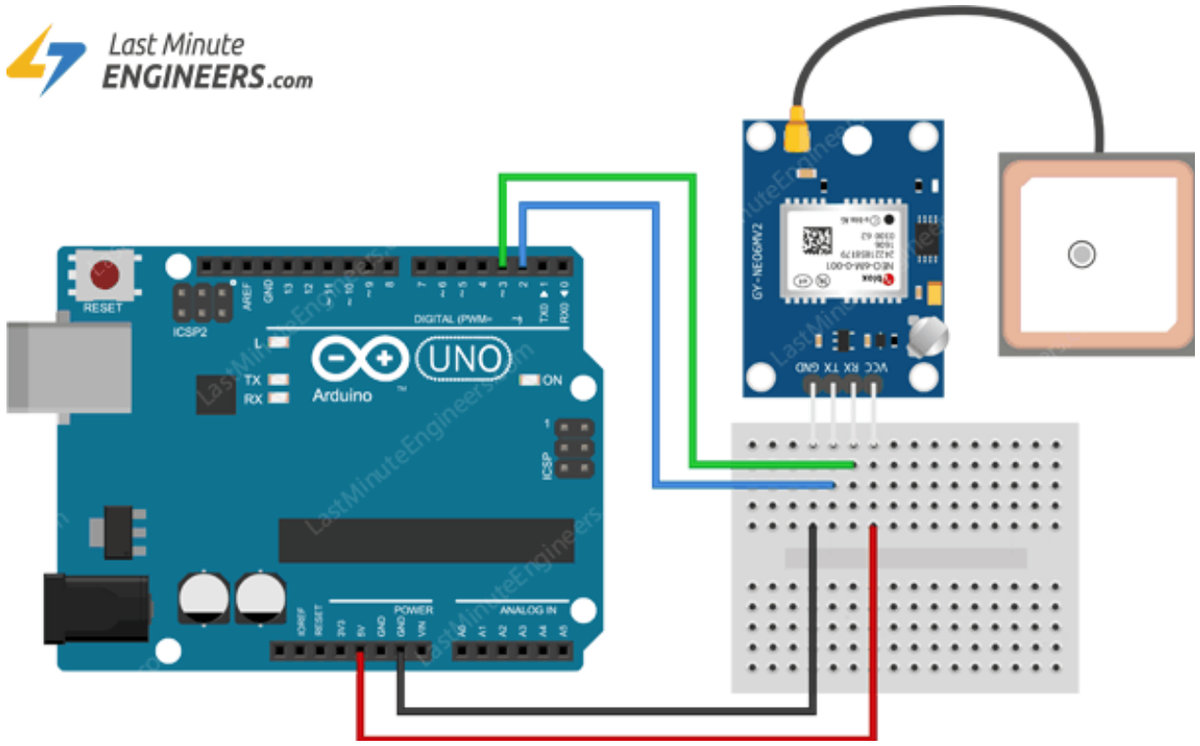


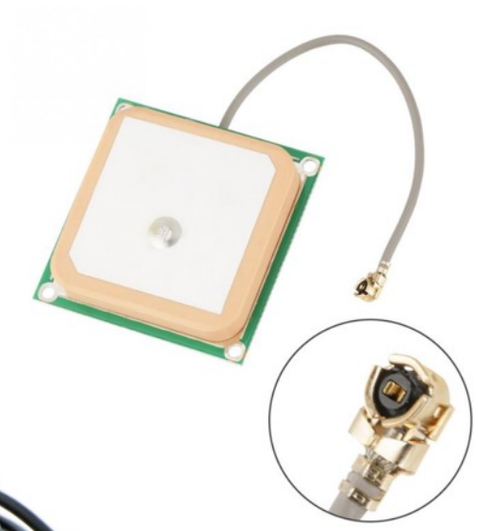
Stacja bazowa, BTS



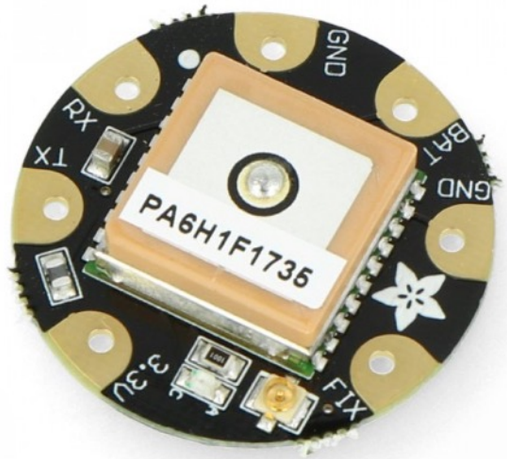
GPS (Global Positioning System)

L1 C/A - 1575.42 MHz
L2 C - 1227.6 MHz
L2 P - 1227.6 MHz
L5 - 1176.45 MHz





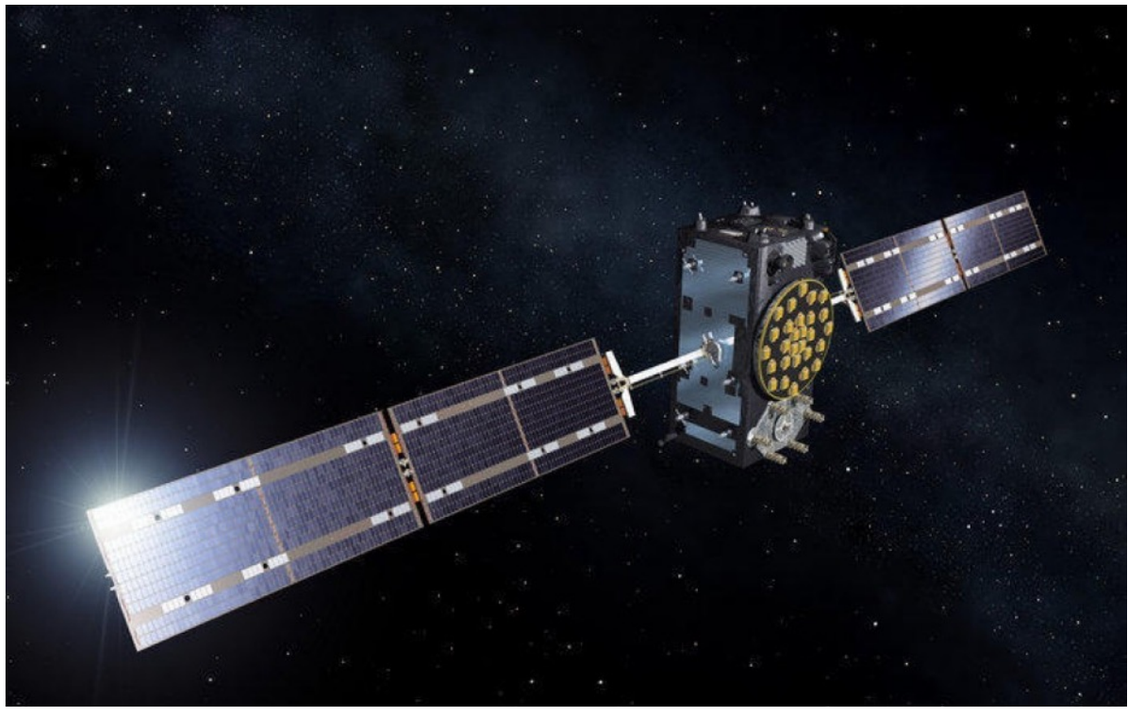
https://lastminuteengineers.com/

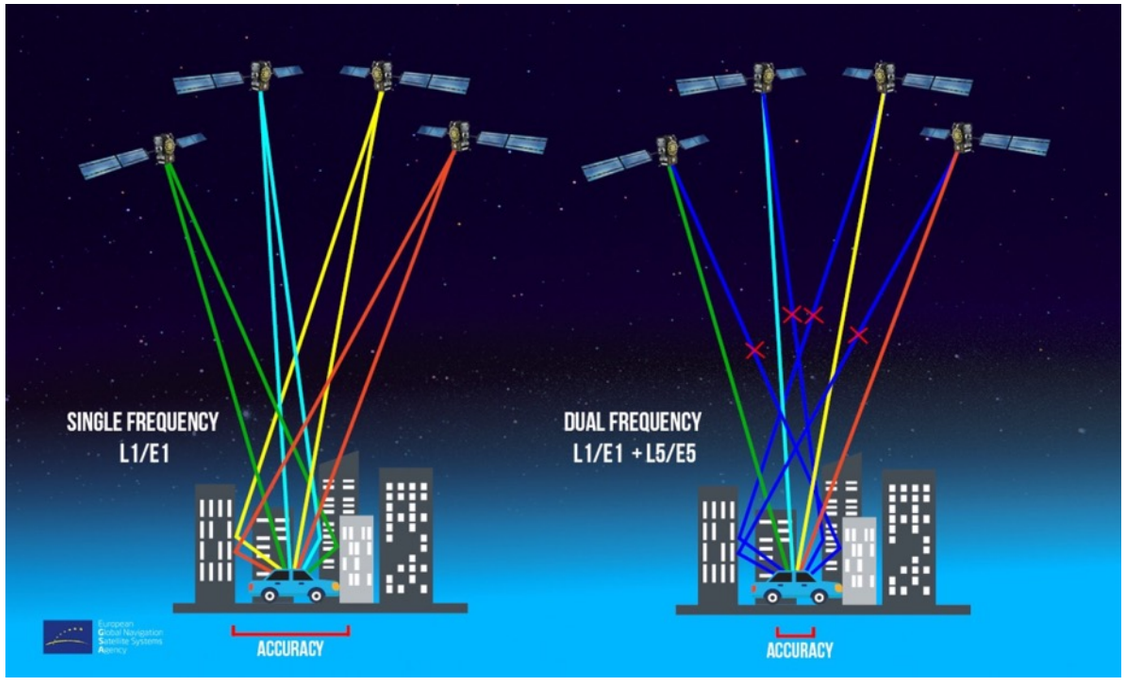


GNSS (Global Navigation Satellite Systems)

GNSS Frequencies and Signals

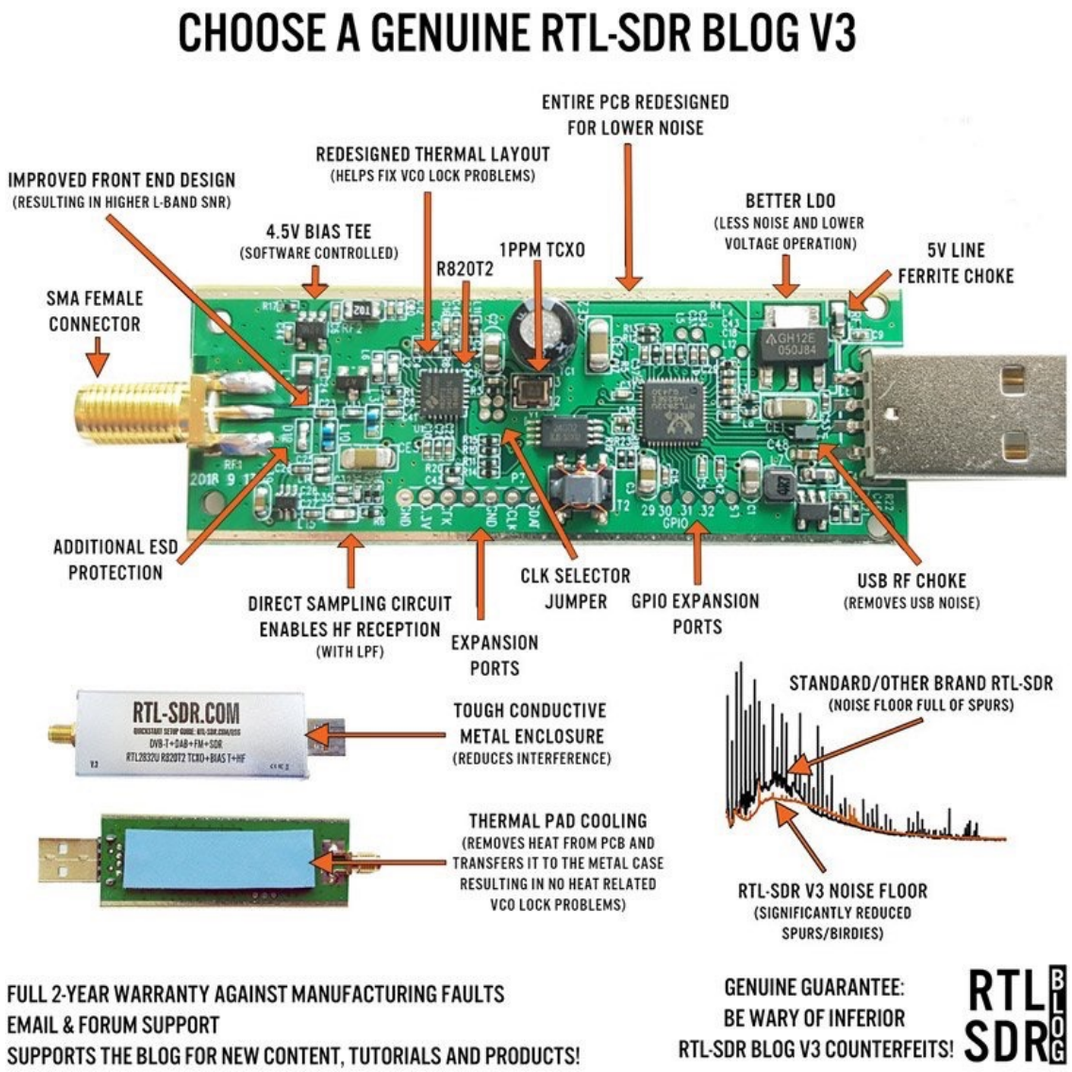
System	Signal	Frequency (MHz)
GPS	L1 C/A	1575.42
	L2 C	1227.6
	L2 P	1227.6
	L5	1176.45
GLONASS	L1 C/A	1598.0625-1609.3125
	L2 C	1242.9375-1251.6875
	L2 P	1242.9375-1251.6875
	L3 OC	1202.025
Galileo	E1	1575.42
	E5a	1176.45
	E5b	1207.14
	E5 AltBOC	1191.795
	E6	1278.75
BeiDou	B1I	1561.098
	B2I	1207.14
	B3	1268.52
	B1C	1575.42
	B2a	1176.45
NAVIC	L5	1176.45
SBAS	L1	1575.42
	L5	1176.45
QZSS	L1 C/A	1575.42
	L1 C	1176.45
	L1S	1575.42
	L2C	1227.6
	L5	1176.45
	L6	1278.75



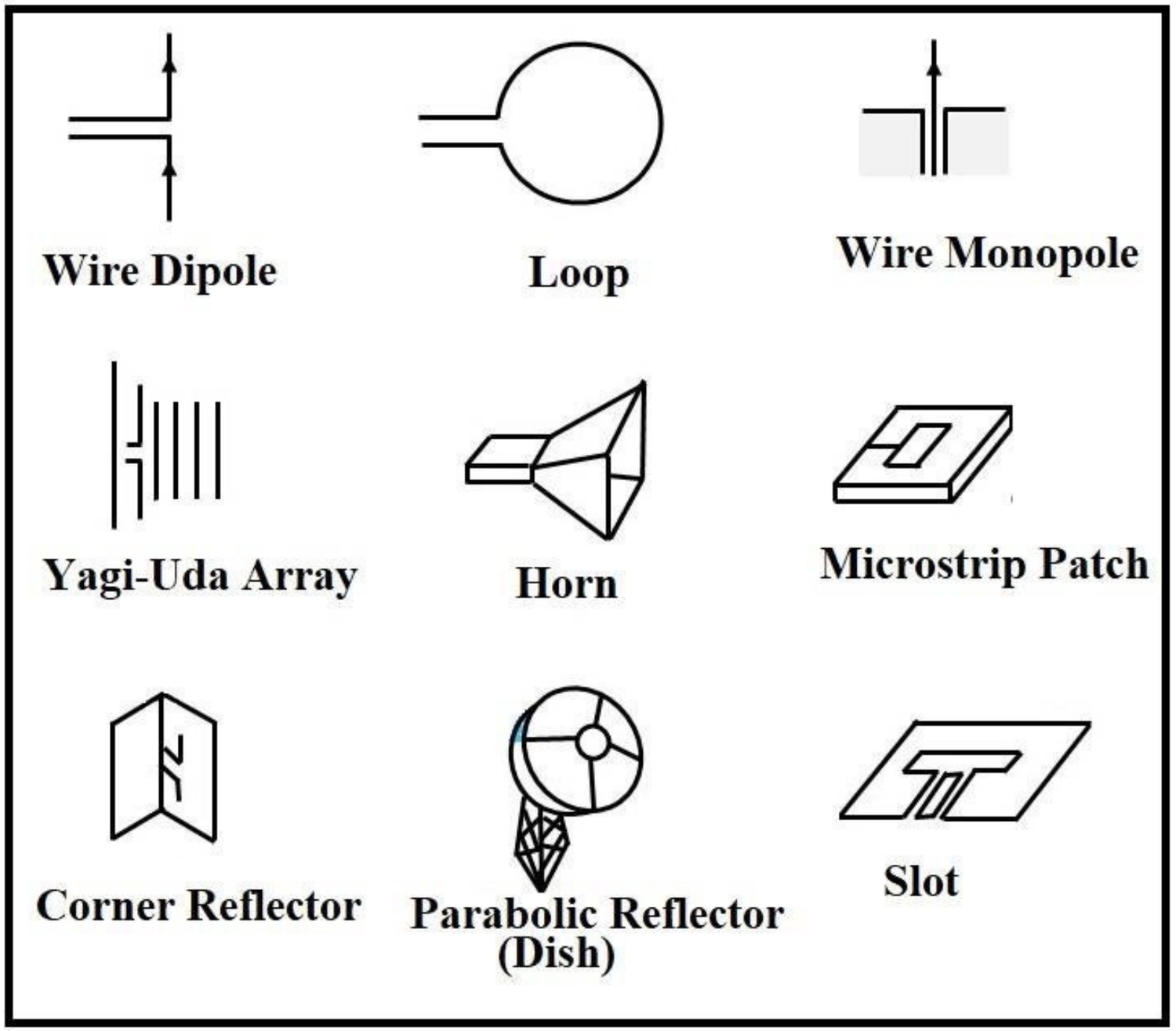


https://novatel.com/support/known-solutions/gnss-frequencies-and-signals

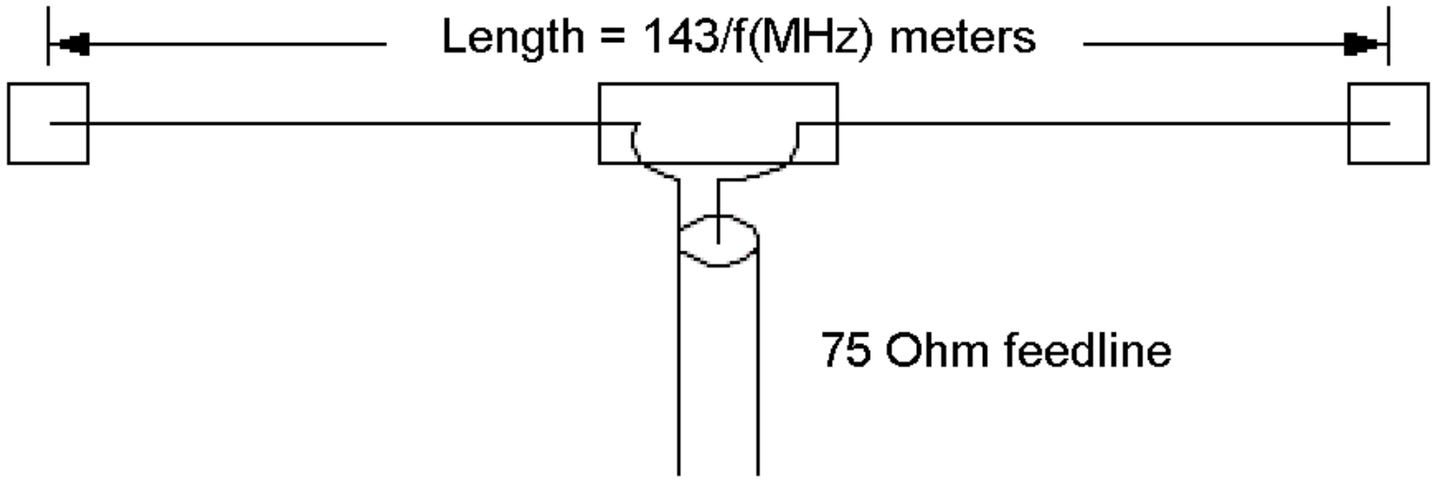
SDR (Software Defined Radio)

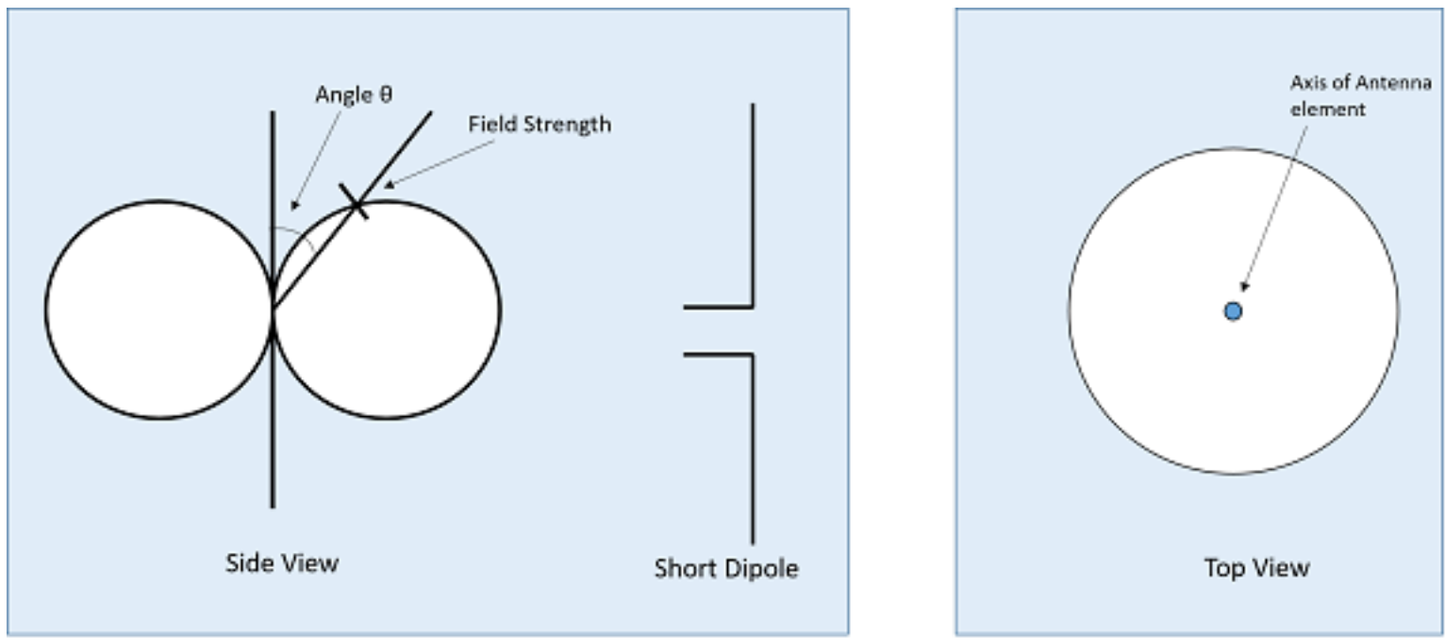


Anteny


Wire Dipole
Loop
Wire Monopole
Yagi-Uda Array
Horn
Microstrip Patch
Corner Reflector
Parabolic Reflector
(Dish)
Slot

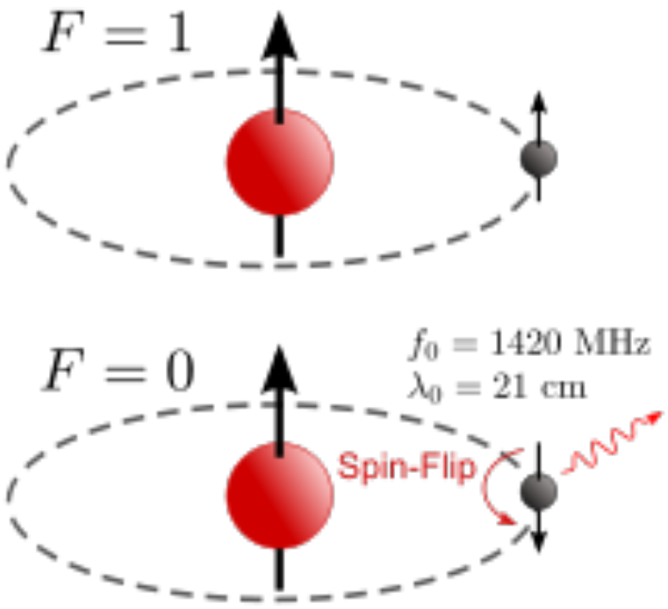
Dipol półfalowy

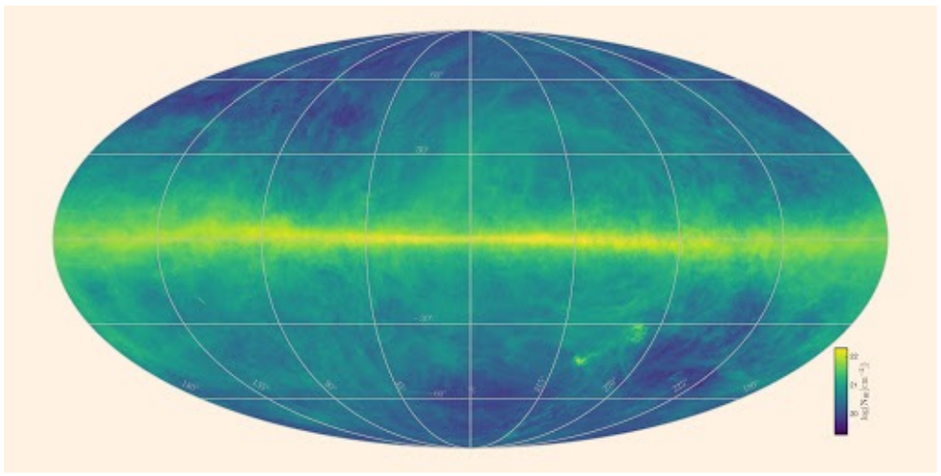




Short dipole antenna radiation pattern

Linia neutralnego wodoru - 21cm (1420.4058 MHz)

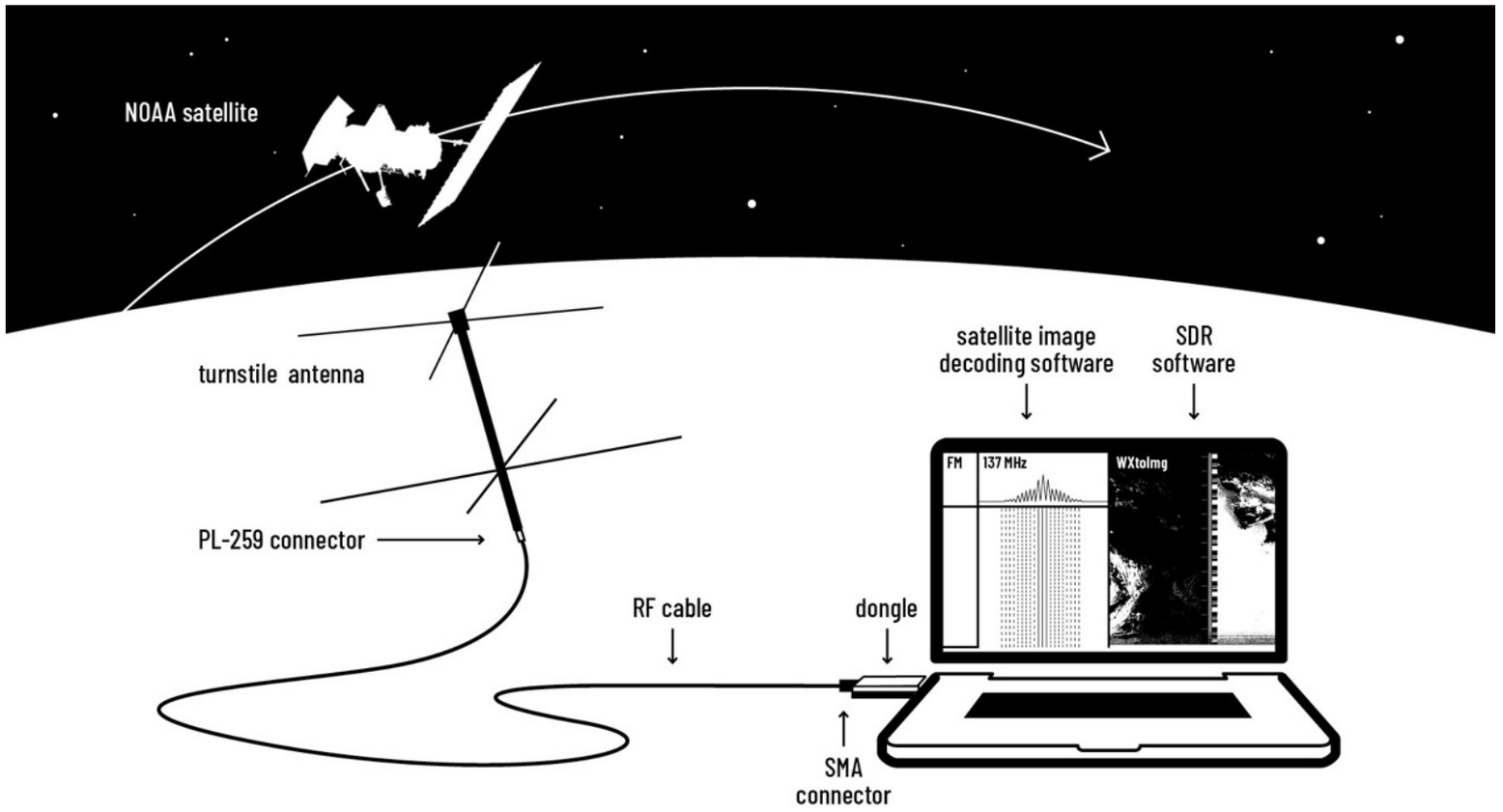


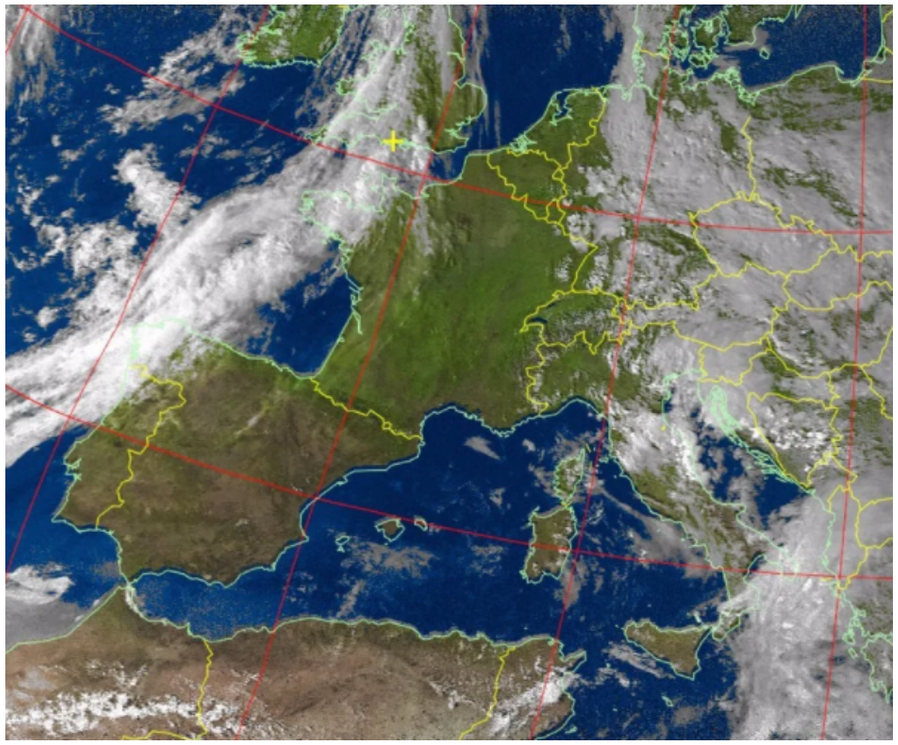


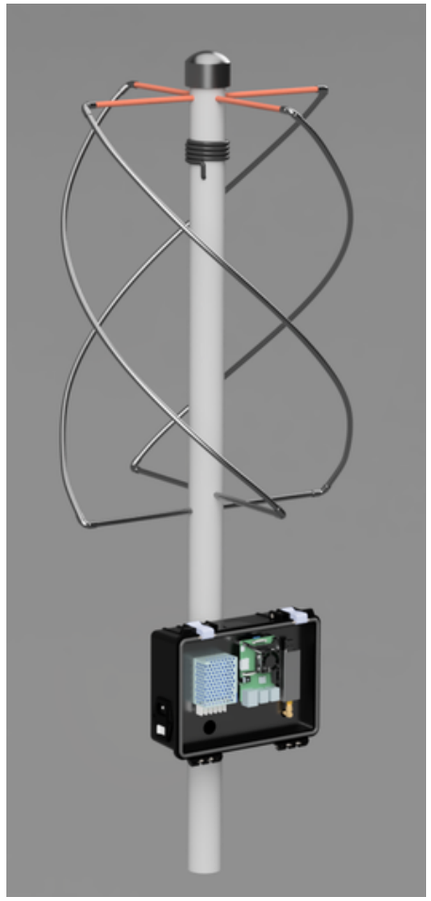
https://www.rtl-sdr.com/tag/hydrogen-line/

http://physicsopenlab.org/2020/07/26/sdr-based-receiver-for-the-21-cm-neutral-hydrogen-line/

Satelity meteorologiczne NOAA







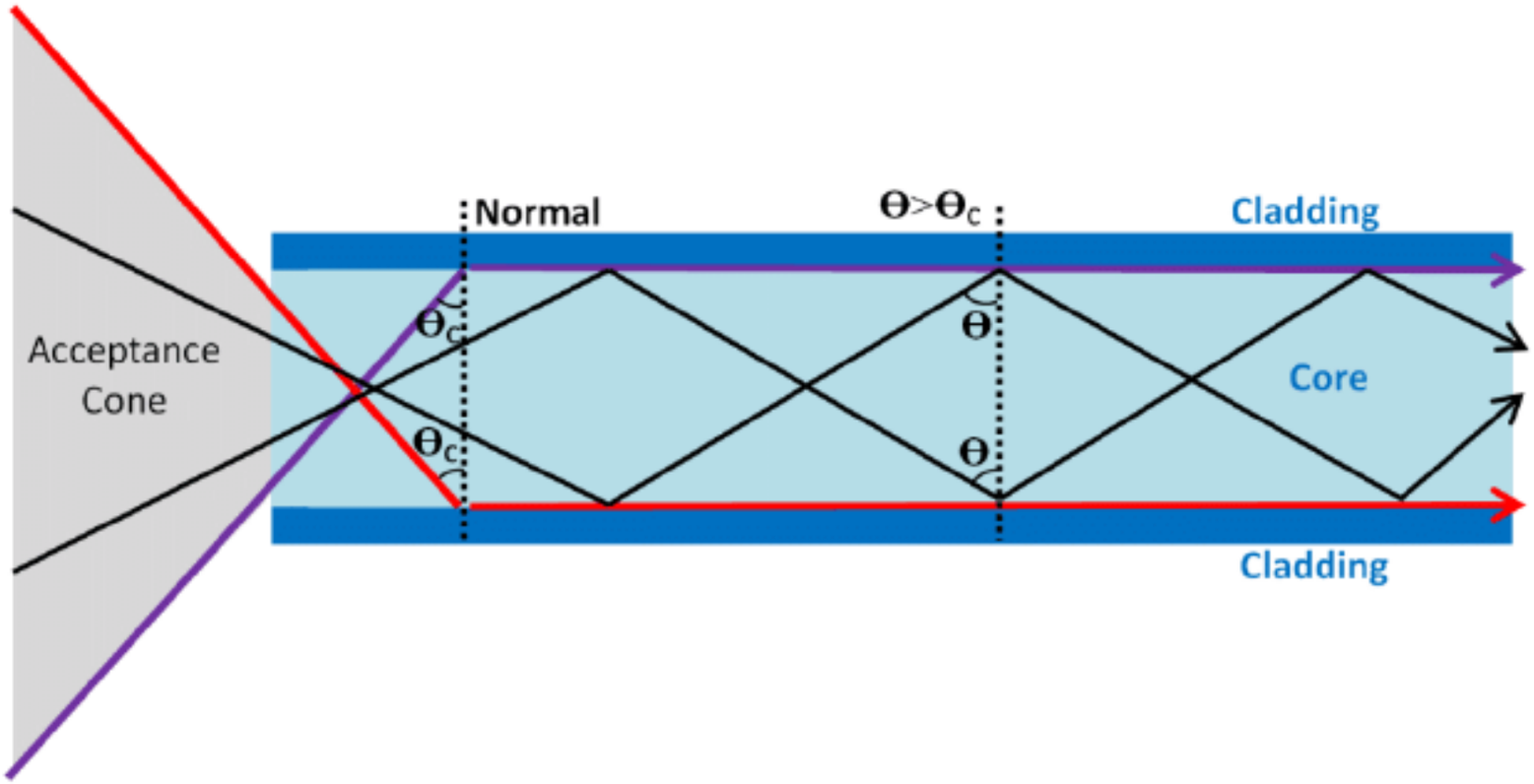
https://publiclab.org/notes/sashae/06-26-2020/diy-satellite-ground-station

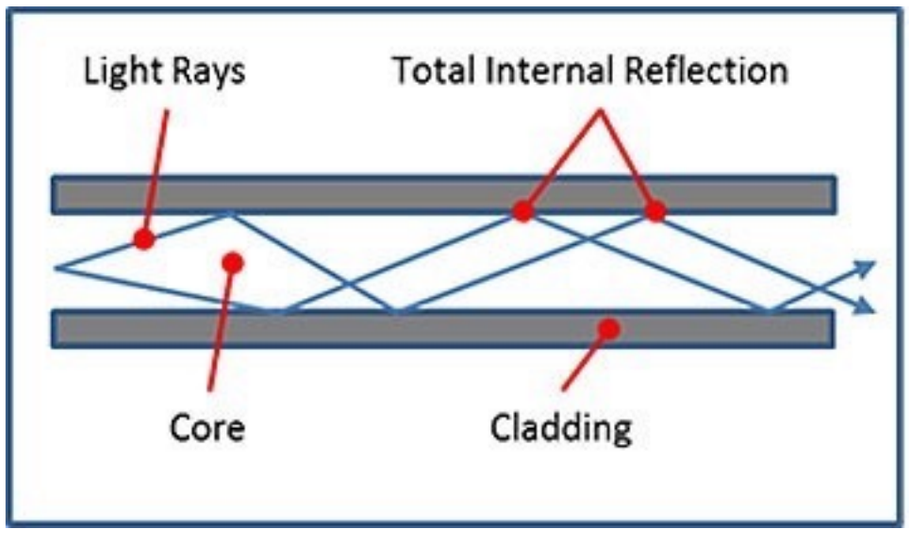
https://hackaday.io/project/169083-noaa-lb-cd

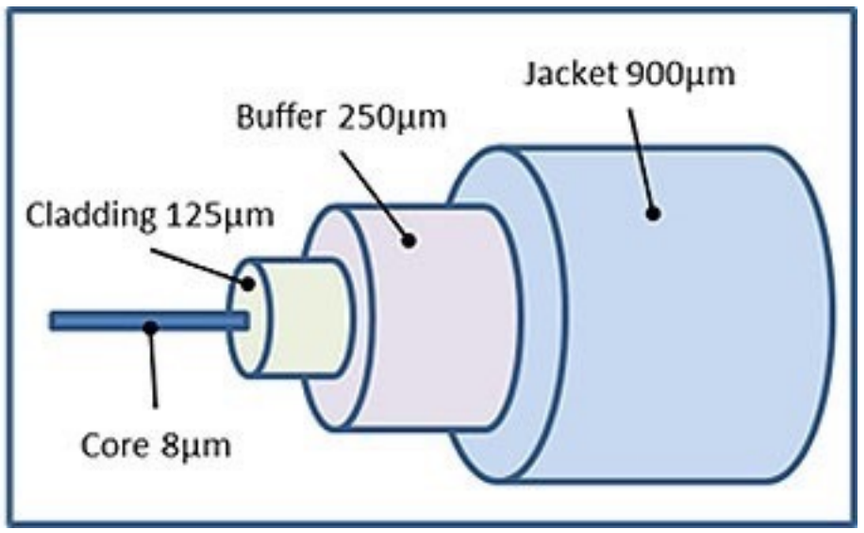
https://www.rtl-sdr.com/rtl-sdr-tutorial-receiving-noaa-weather-satellite-images/

ŚWIATŁOWODY

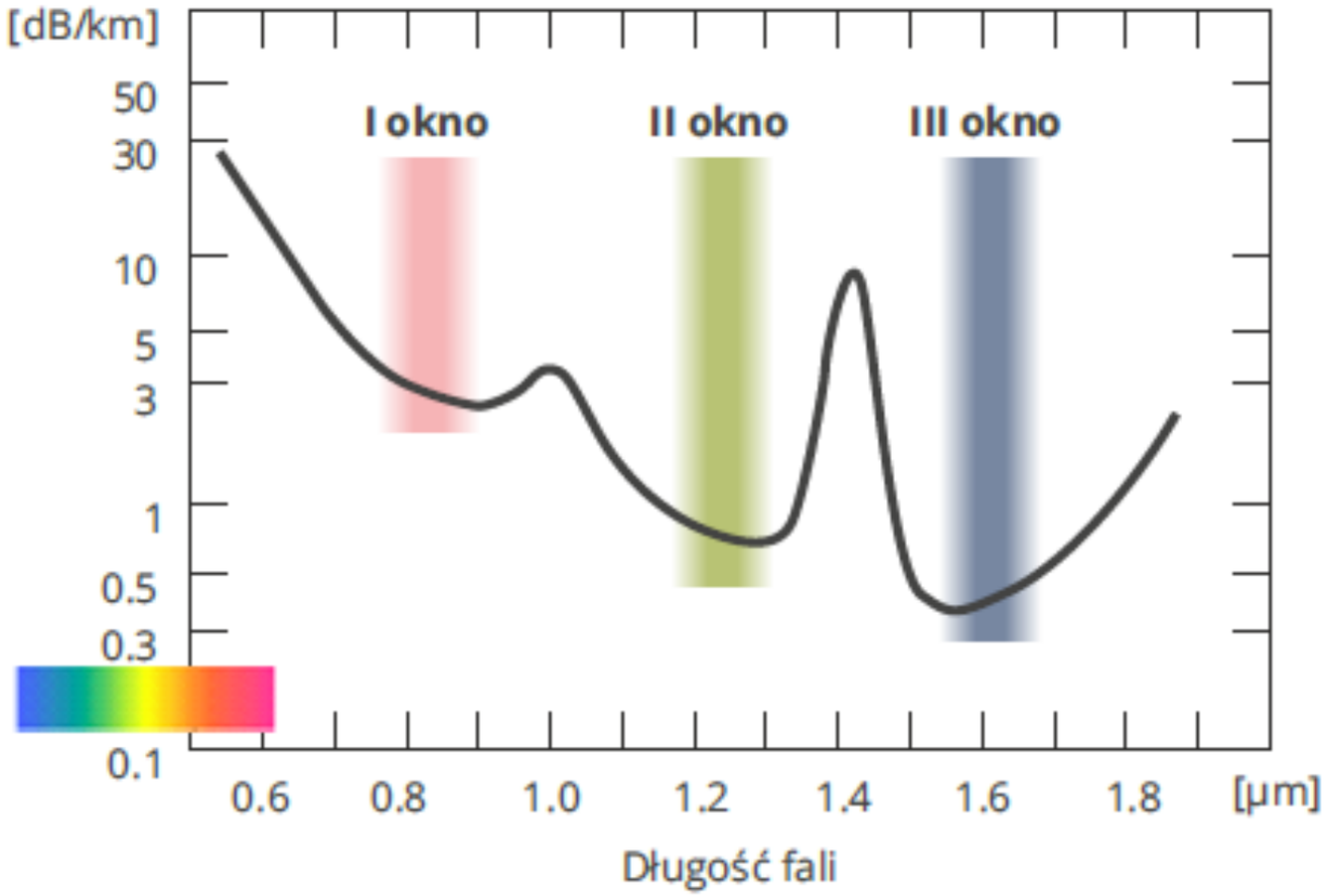
Całkowite wewnętrzne odbicie







Okna Transmisyjne



I: 850 nm

II: 1300/1310 nm

II: 1490/1550 nm

Główne typy światłowodów

Jednomodowe

Duże odległości

Wielomodowe

Małe odległości

Złącza światłowodowe

LC Connector

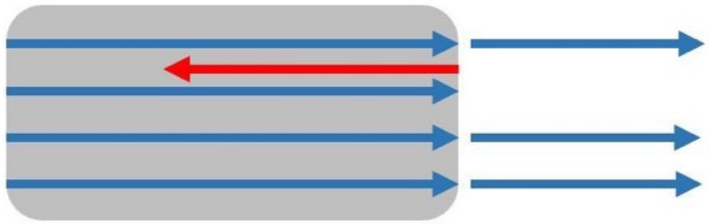
SC Connector

ST Connector

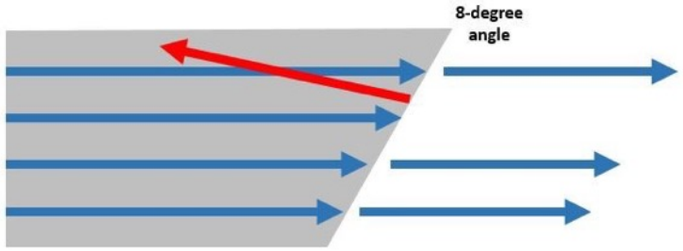
MTRJ

MU

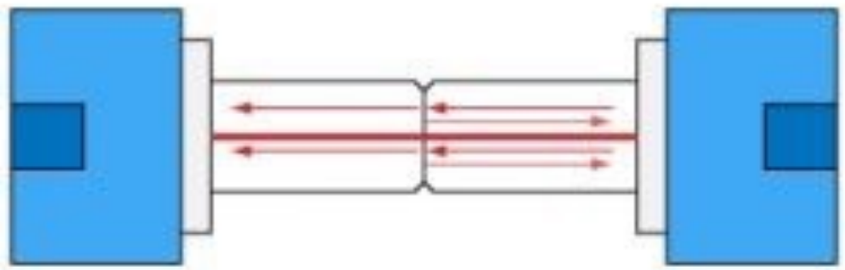
E 2000 Connector

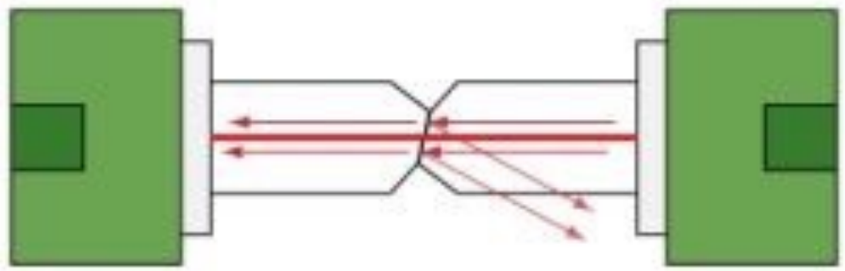


UPC



APC





Media konwertery

Pomiar prędkości światła w światłowodzie

https://twitter.com/mifune/status/1304480913754066945

Optyczna sztuczna sieć neuronowa

https://jakubmielczarek.com/2020/04/18/optyczny-mozg/