



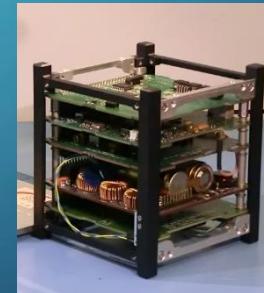
SYSTÈME DE POURSUITE ANTENNES

ANNEMASSE - 11 NOVEMBRE 2017

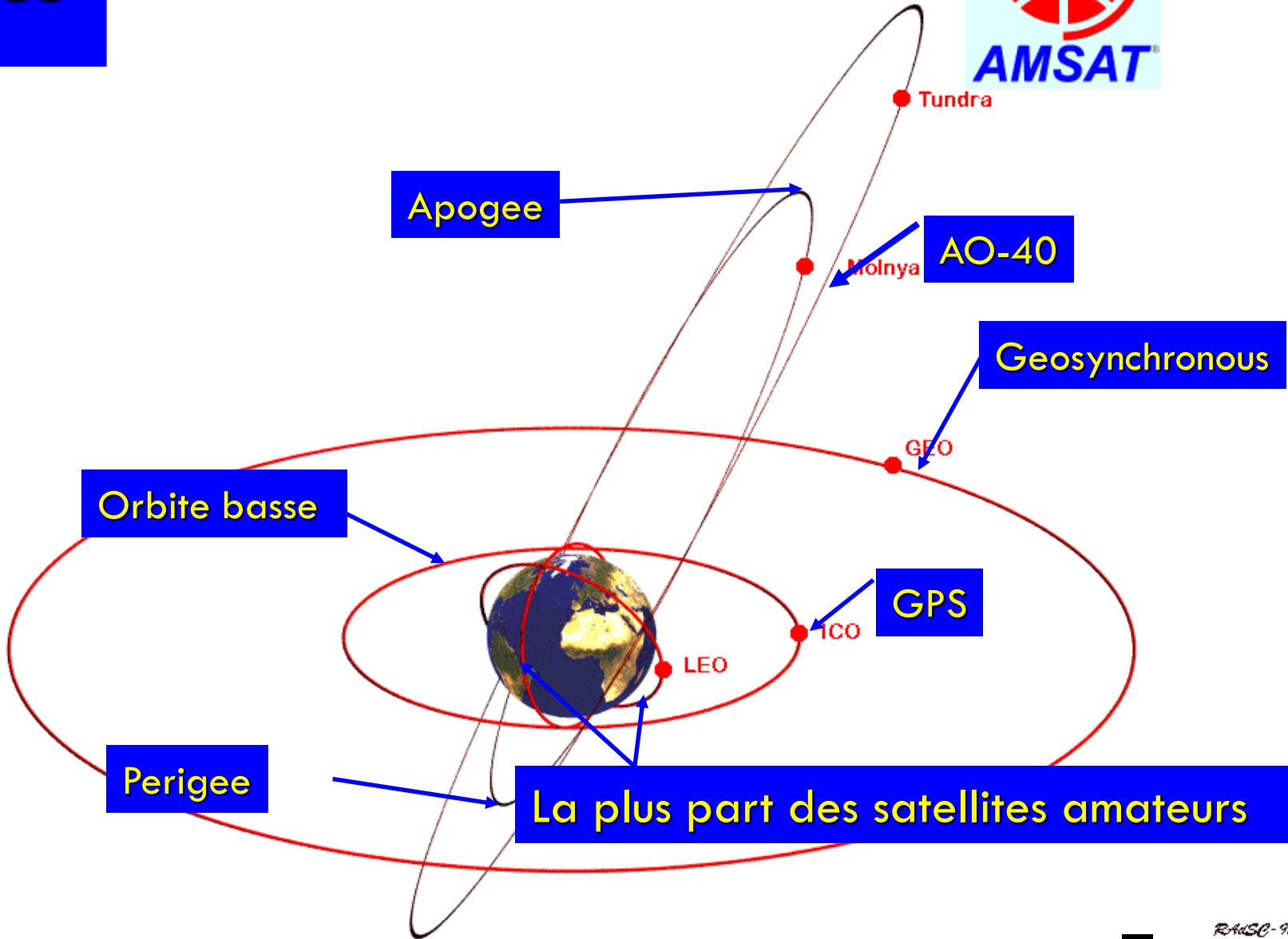
JEAN-LOUIS F5DJL – K1JLT

LE PROGRAMME

- Les orbites
- Prédictions, logiciels et protocoles
- Synoptique contrôle d' antenne
- Réalisation pratique : modules REF
- Autres applications (Hyper, EME ,...)
- Questions et démonstration

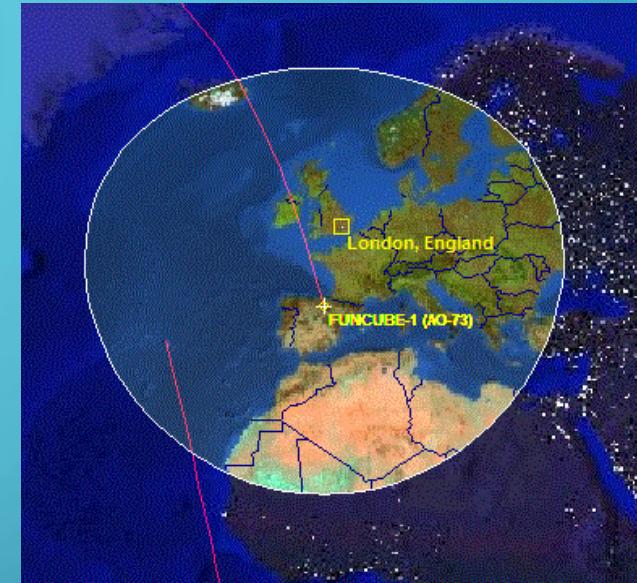


Types d'orbites



Où est le satellite et avec qui puis je communiquer ?

- Plus l' orbite est haute plus la zone de couverture est grande
- Toutes les stations à l intérieur de la zone de couverture peuvent communiquer : Iceland to Libye
- Orbite basse = temps de passage court
Ex: ISS a 400km : 10 minutes
- De très nombreux logiciels disponibles sous Windows , Linux , ou Android



1 Sat	FUNC~AO-73)
Azimuth	191.6°
Elevation	27.0°
Range	1,268.8 km
Height	657.5 km
AOS time	21:34:21 UTC
LOS time	21:48:06 UTC
Until	00:09:18
Duration	00:13:45
AOS Az.	176°
Max El.	57°
LOS Az.	344°
Visual	Eclipse
Orbit #	6,089

PST ROTATOR



This screenshot displays several windows from the PstRotator version 12.70 interface:

- Satellites Tracking:** Shows an Omni-Rig setup with RX 29.801116, TX 29.190000, Mode FM, VFO RXA 1368, and Status On Line. It also shows Downlink - UpLink (Hz) at 145.800.000, 145.200.000, 145.001.116, and 145.198.008. The Satellite Details panel is focused on the ISS (ZARYA) with information like Altitude: 326.13 km, Elevation: 24.75 deg, Range: 8.74 km, Height: 412 km, Declination: 20.00 deg, Inclination: 48.94 deg, Range rate: -0.25 km/s, AOS: 13:13:06, LOS: 13:03:06, and Time to AOS: 1:05 + 00:06.59. The Satellites list includes various satellites like AS2 (FD 28), -4B (SAT CO 52), FUN-CUBE-1 (SD-73), JEL-HU-3 (DU-68), ODU (HU-81), DRAVAT (HU-20), ISAT (HU-19), SSO-AP-7 (HU-71), EC45SAT-B (SD-32), FUN-CUBE, RAS-POSTC (RS-16), TUFsat, and MUSS-1 (HU-30).

ISS (ZARYA)

Date	RCS	LOS	EL.	Visible
2015-12-20	09:26:14	-09:47:53	15	9m19s
2015-12-20	11:13:31	-11:24:23	05	1m30s
2015-12-20	12:50:38	-13:00:56	27	10m30s
2015-12-20	14:27:08	-14:38:00	24	10m30s
2015-12-20	16:04:04	-16:43:07	61	1m30s
2015-12-20	17:40:42	-17:50:51	29	10m30s
2015-12-21	08:46:26	-08:54:09	05	9m20s
2015-12-21	10:20:31	-10:31:24	48	10m59s
2015-12-21	11:57:05	-12:07:54	34	10m40s
- Predict:** Shows a table for the ISS (ZARYA) with columns Date, RCS, LOS, EL., and Visible, listing the same orbital passes as the Tracking window.
- Satellites Map:** A world map showing satellite positions and visibility across different regions.
- Bottom Window:** A smaller instance of the PstRotator interface showing a QRA map with coordinates 145.6, 145.6, and a GO button.

Antennes et Rotors



Antennas at GOMRF

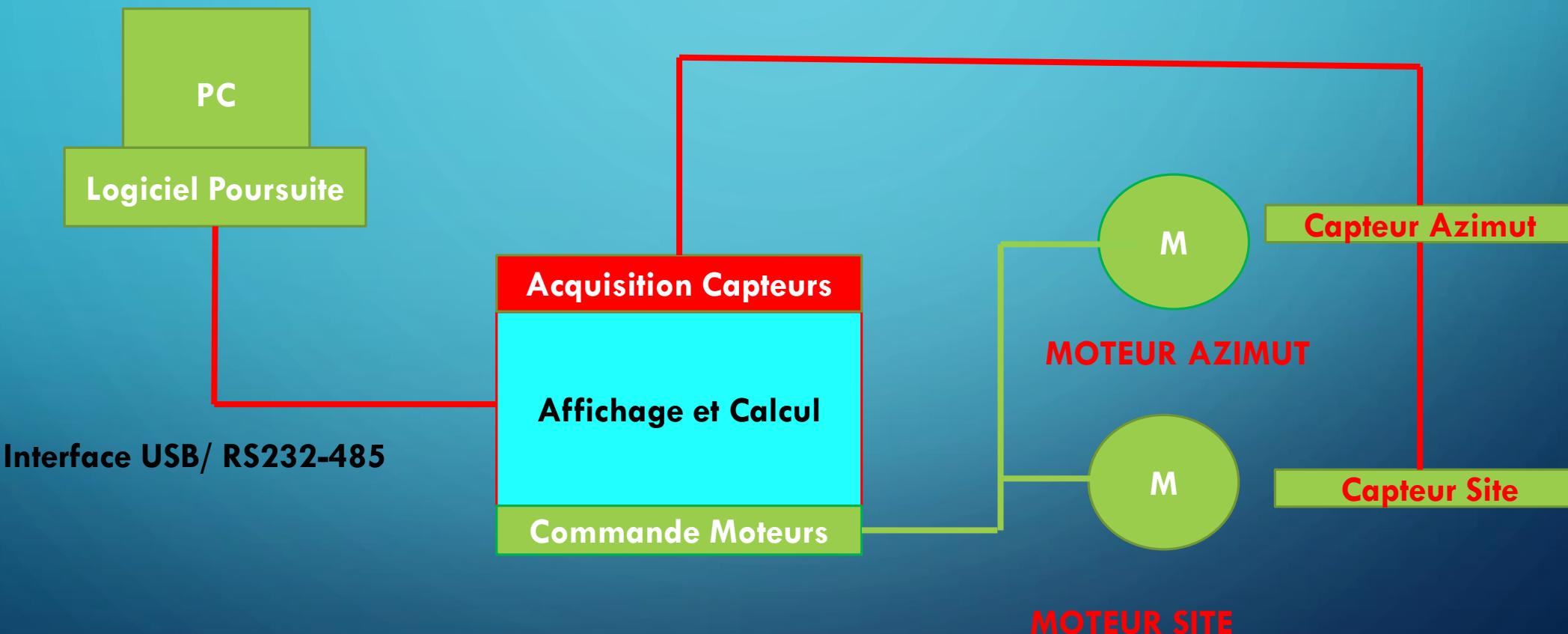


Antennas at F5DJL



DD1US: Az/Elevation rotators

SYNOPTIQUE CONTRÔLE ANTENNE



COMMUNICATION PC - INTERFACE

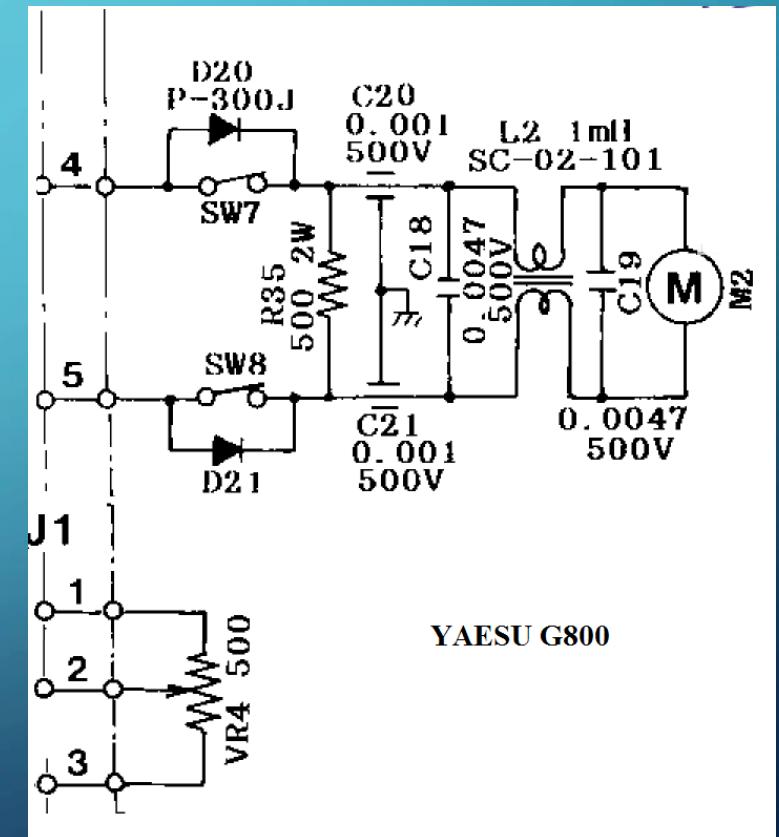
- Protocoles multiples
- Document : Reference dual protocol v2.0 par VE2DX
- Interface série RS232/RS485 ou USB
- Choix : EasyComm 1 et GS 232B
- Configuration du logiciel de pilotage
 - Protocole & vitesse
- Implémentation variable : ex CR ou CR/LF

MOTEUR ANTENNES

DIVERSES SOLUTIONS

MOTEUR : POTENTIOMÈTRE - CODEUR

VÉRIN : INCLINOMÈTRE - IMPULSIONS



YAESU G800

LES CAPTEURS

- Résolution – Précision – Stabilité

- Azimut:

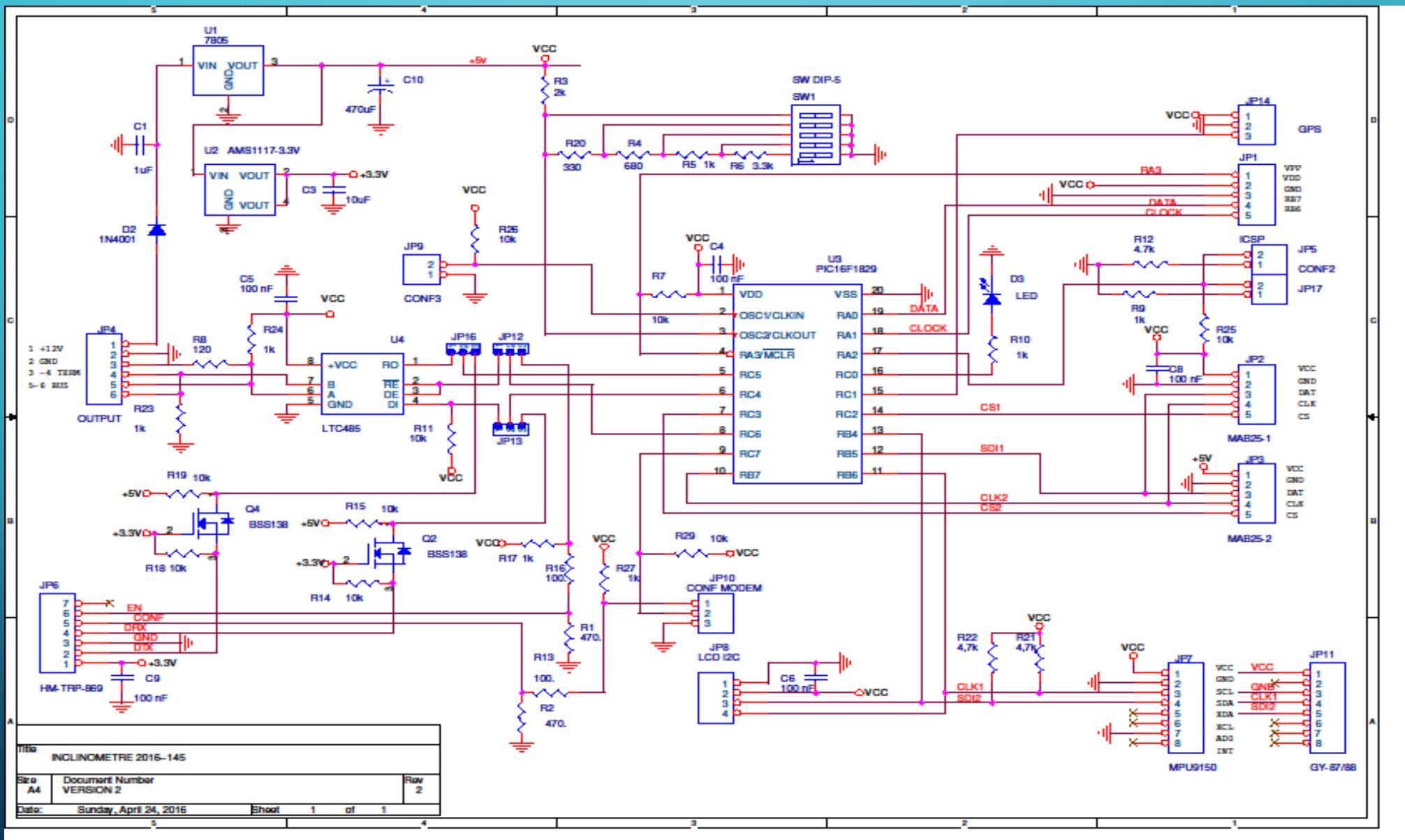
Potentiomètre	Rés: 1° Prés : 3°
Codeur Megatron (14 Bits)	Rés: 0.1° Prés : < 0.5°
Boussole magnétique électronique	non OK

- Site

Potentiomètre	Rés:0.1° Prés : ~ 1°
Inclinomètre InvenSense MPU6050	
Codeur Megatron	

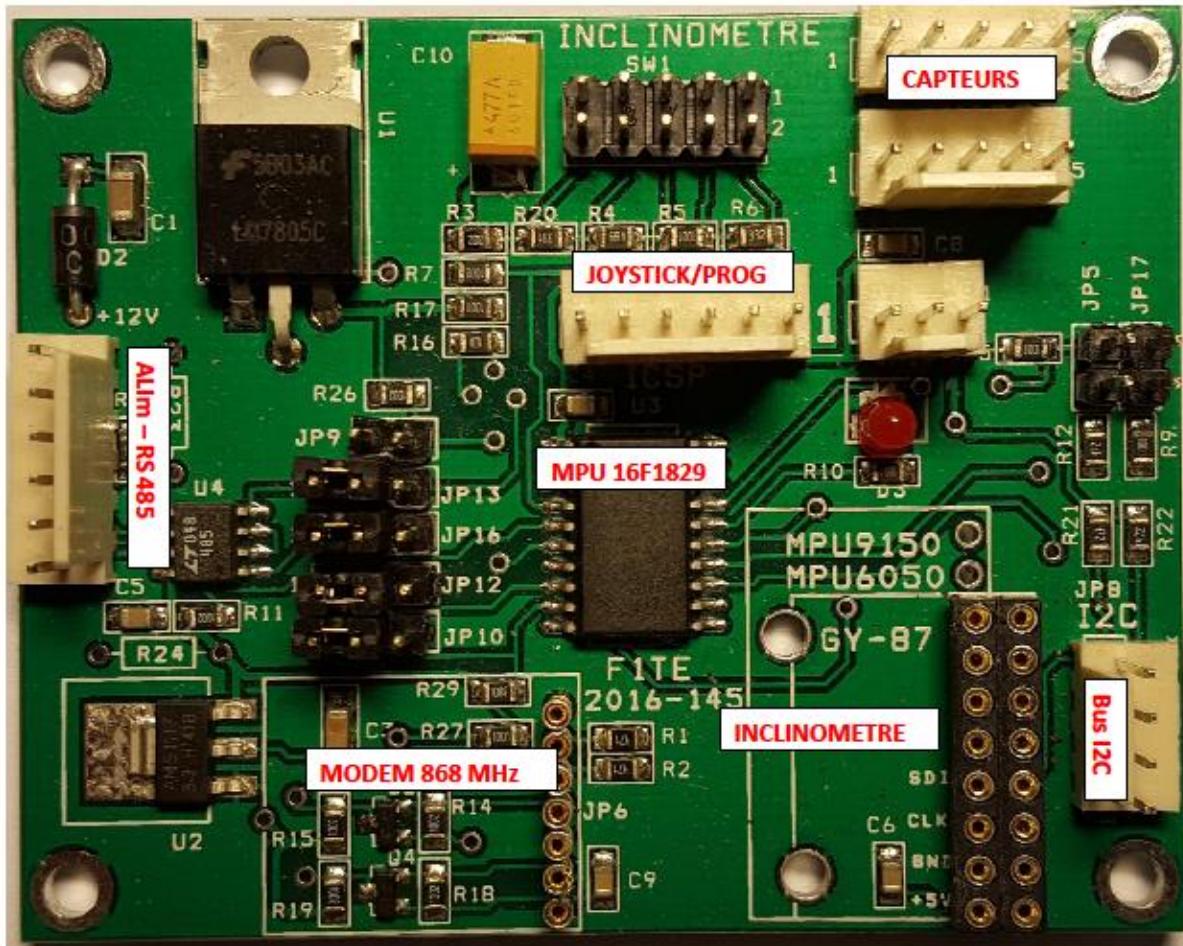


SCHEMA DE LA CARTE CONTROLEUR

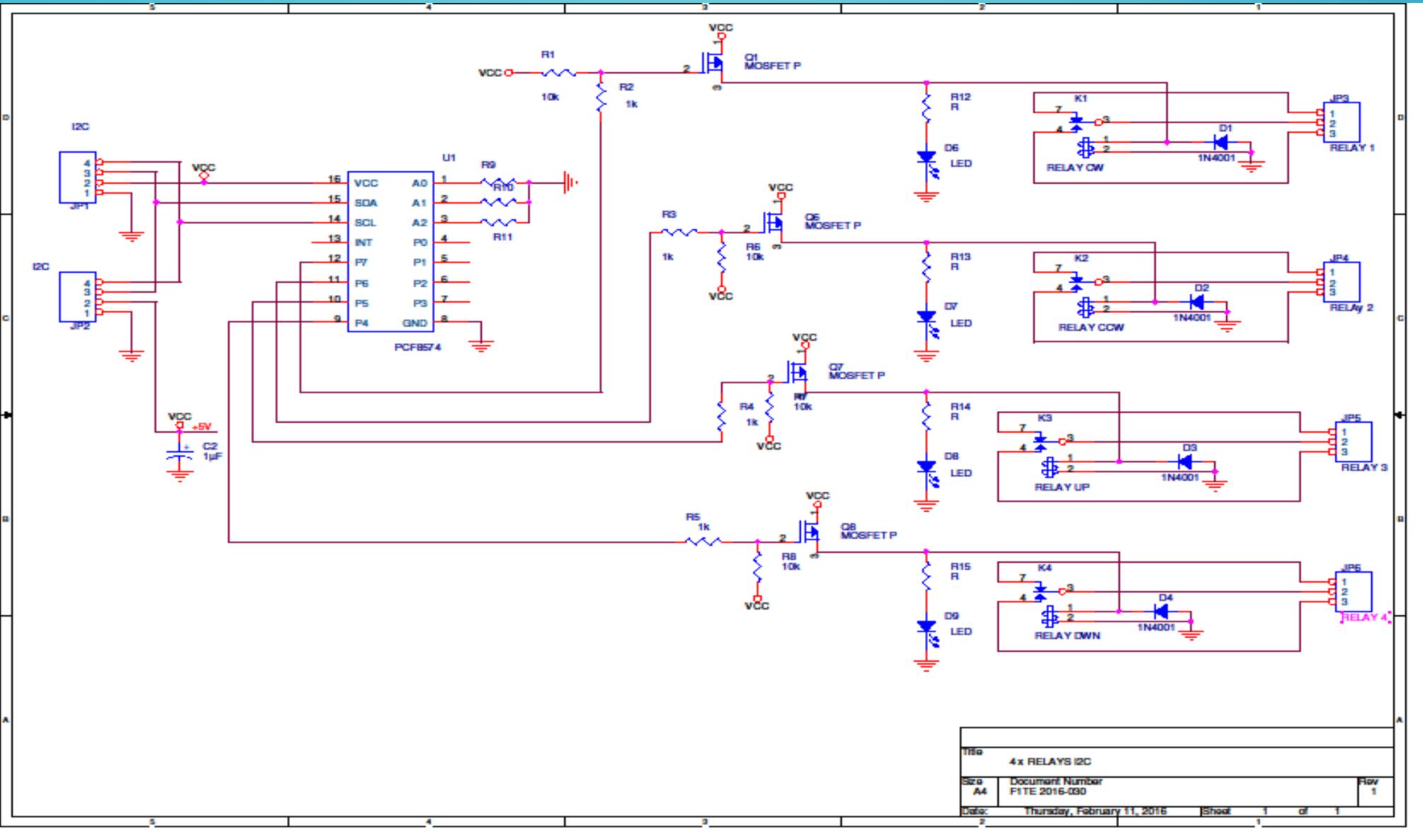


LES MODULES REF – F1TE & F5DJL

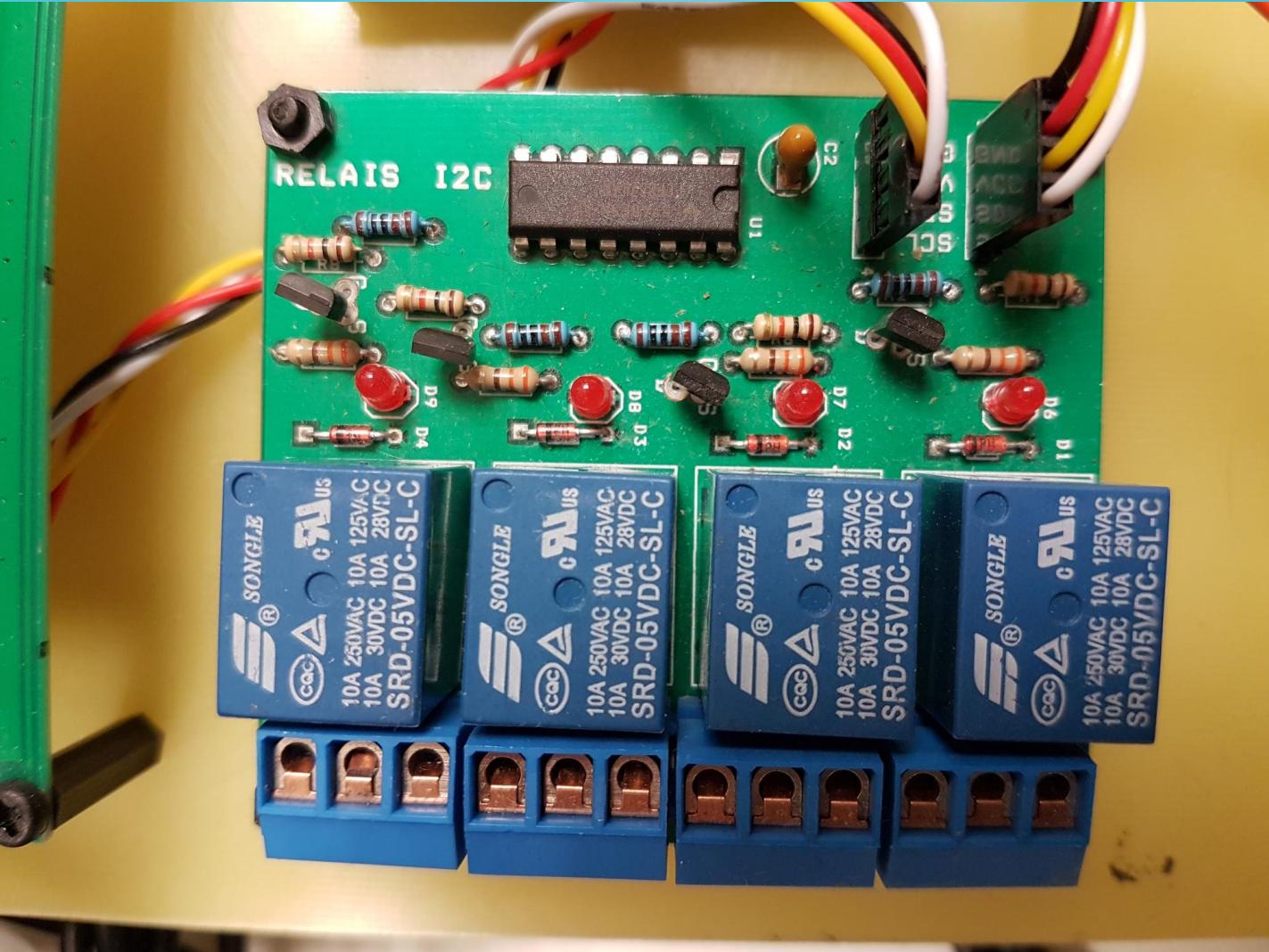
<HTTP://WWW.F1TE.ORG/INDEX.PHP/REALISATIONS/PILOTAGE-D-ANTENNES/TRACKER>
<HTTPS://BOUTIQUE.R-E-F.ORG/> (MEMBRE POUR ACCÉDER A LA BOUTIQUE)



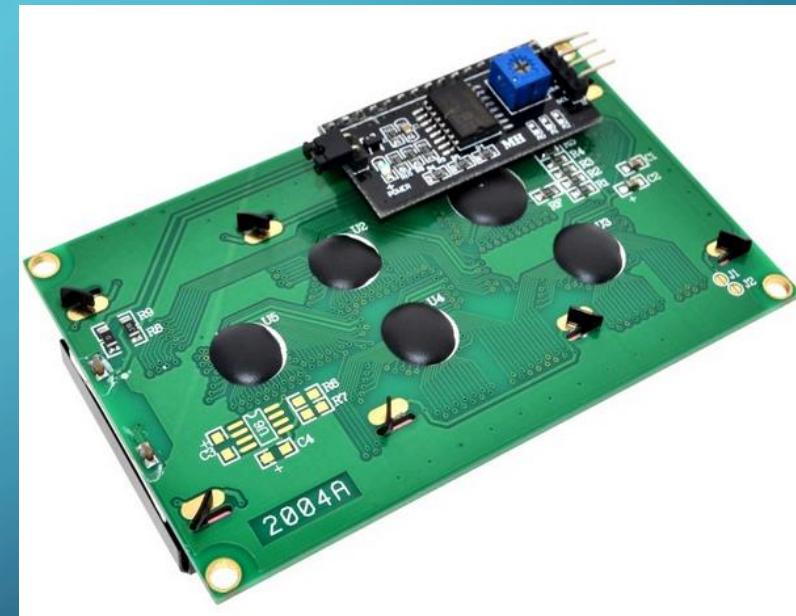
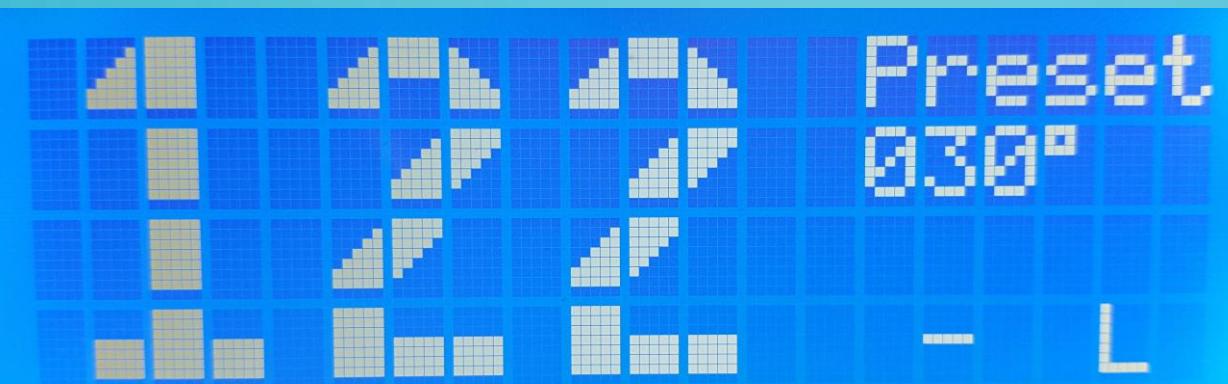
CARTE RELAIS



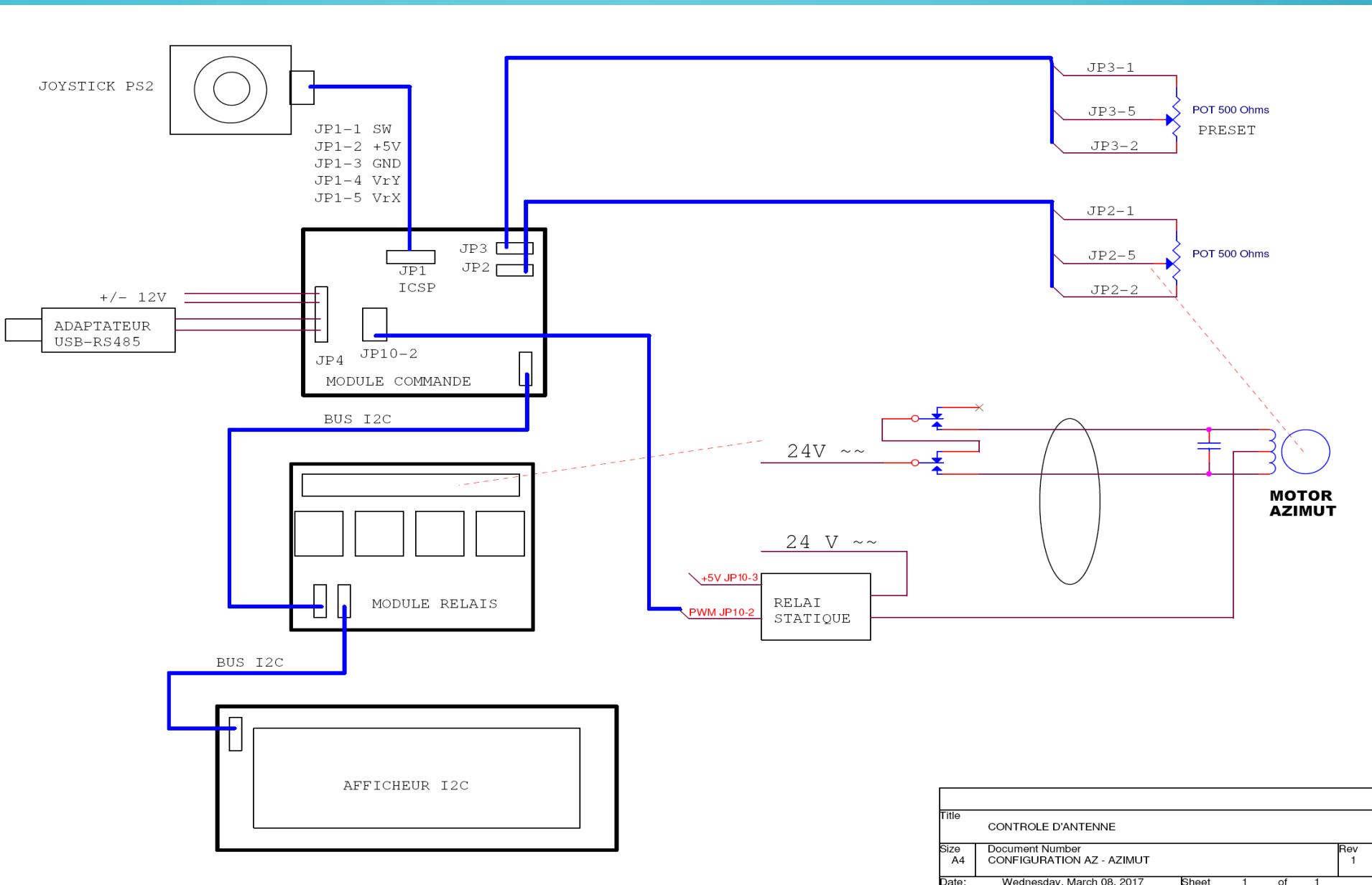
LA CARTE RELAIS I2C



PERIPHERIQUES

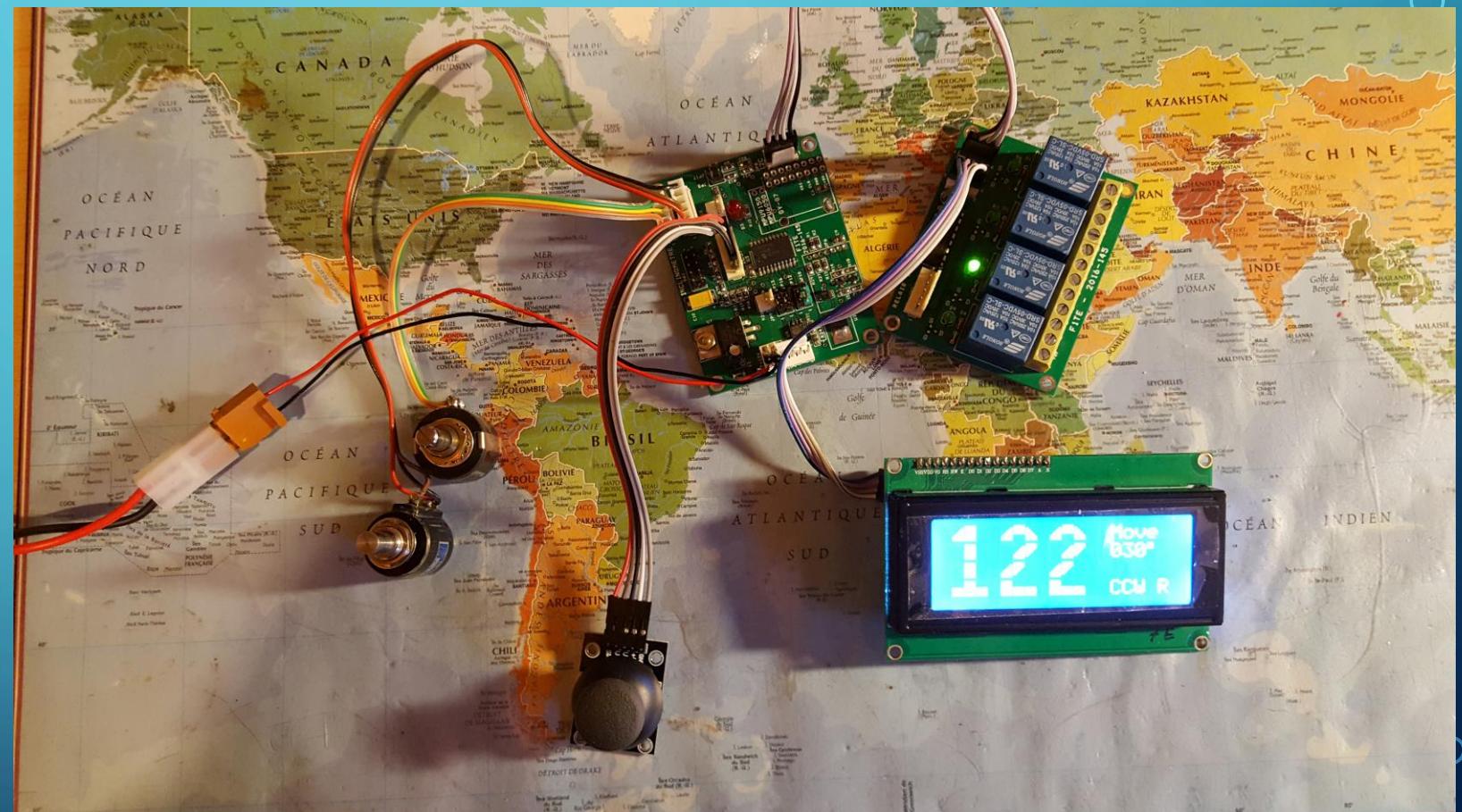


CONFIGURATION MINIMUM

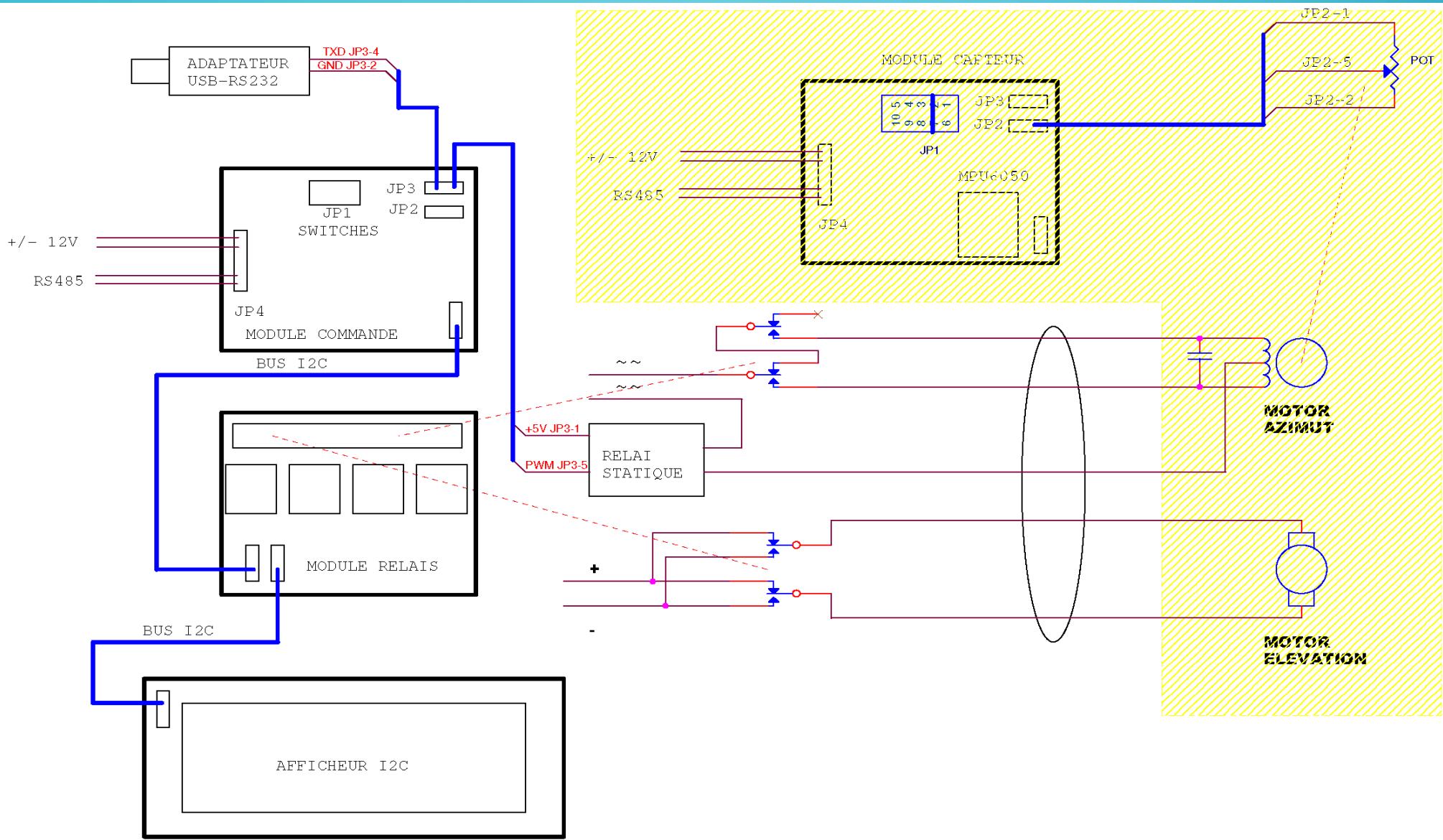


CONFIGURATION MINIMUM

UNE CARTE CONTRÔLEUR
UNE CARTE RELAIS
UN AFFICHEUR
UN JOYSTICK



CONFIGURATION AZ/EL REMOTE



TRACKER



ALIDADE 2017



- <http://www.f1te.org/index.php/realisations/pilotage-d-antennes/tracker>
- Articles dans Radio-REF : Octobre 2016 et Juin 2017
- Boutique du REF : <https://boutique.r-e-f.org/>
- Forum Technique : <http://forum-kit.r-e-f.org/viewforum.php?f=1>
- Sites de F8KCF et REF 74 : liens sur les présentations de ce jour
 - <http://ref74.r-e-f.org/ref74/index.php/accueil>
 - <https://f8kcf.net/>
- Email : f5djl@f5djl.fr

MERCI A TOUS DE VOTRE ATTENTION