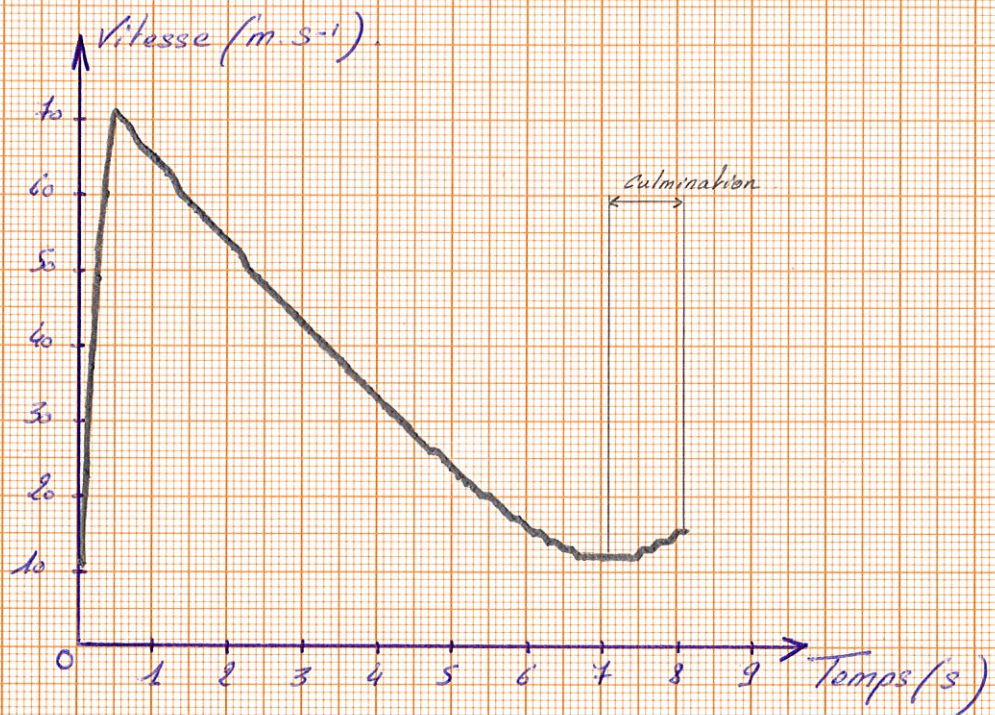


Fusée : SA-7 KILTER

Club : AERO-IPSA

Moteur : Koudou      Masse au décollage : 2 kg  
Site de la rampe : 80°      Gisement de la rampe : 0°  
 $C_x$  estimé : 6,8      Maître couple : 1963 mm<sup>2</sup>  
Vitesse sous parachute : 6 m/s  
Ouverture du parachute : 8 s  
Fichier vent : nul.



fusée : SA-7 KILTER club : AERO-IPSA

moteur : koudou masse au décollage : 2.0 kg  
site de la rampe : 80° gisement de la rampe : 0°  
Cx estimé : 0.80 maître couple : 1963 mm<sup>2</sup>  
vitesse sous parachute : 6 m/s ouverture du parachute : 8 s  
fichier vent : ventnul.ven

t=0.000s	z-z0=	2m	v=	11m/s	x=	0m	y=	0m	g=107m/s <sup>2</sup>	A= 80°
sortie de rampe										
t=0.170s	z-z0=	2m	v=	23m/s	x=	0m	y=	0m	g=137m/s <sup>2</sup>	A= 80°
t=0.100s	z-z0=	5m	v=	24m/s	x=	1m	y=	0m	g=137m/s <sup>2</sup>	A= 80°
t=0.200s	z-z0=	9m	v=	37m/s	x=	2m	y=	0m	g=127m/s <sup>2</sup>	A= 80°
t=0.300s	z-z0=	14m	v=	49m/s	x=	3m	y=	0m	g=117m/s <sup>2</sup>	A= 80°
t=0.400s	z-z0=	21m	v=	60m/s	x=	4m	y=	0m	g=113m/s <sup>2</sup>	A= 79°
t=0.500s	z-z0=	28m	v=	71m/s	x=	5m	y=	0m	g=110m/s <sup>2</sup>	A= 79°
t=0.600s	z-z0=	35m	v=	70m/s	x=	7m	y=	0m	g= 12m/s <sup>2</sup>	A= 79°
fin de propulsion										
t=0.700s	z-z0=	42m	v=	69m/s	x=	8m	y=	0m	g= 12m/s <sup>2</sup>	A= 79°
t=0.800s	z-z0=	48m	v=	67m/s	x=	9m	y=	0m	g= 12m/s <sup>2</sup>	A= 79°
t=0.900s	z-z0=	55m	v=	66m/s	x=	11m	y=	0m	g= 12m/s <sup>2</sup>	A= 79°
t=1.000s	z-z0=	61m	v=	65m/s	x=	12m	y=	0m	g= 12m/s <sup>2</sup>	A= 78°
t=1.100s	z-z0=	67m	v=	64m/s	x=	13m	y=	0m	g= 12m/s <sup>2</sup>	A= 78°
t=1.200s	z-z0=	73m	v=	63m/s	x=	14m	y=	0m	g= 12m/s <sup>2</sup>	A= 78°
t=1.300s	z-z0=	79m	v=	62m/s	x=	16m	y=	0m	g= 12m/s <sup>2</sup>	A= 78°
t=1.400s	z-z0=	85m	v=	60m/s	x=	17m	y=	0m	g= 12m/s <sup>2</sup>	A= 78°
t=1.500s	z-z0=	91m	v=	59m/s	x=	18m	y=	0m	g= 12m/s <sup>2</sup>	A= 77°
t=1.600s	z-z0=	97m	v=	58m/s	x=	20m	y=	0m	g= 12m/s <sup>2</sup>	A= 77°
t=1.700s	z-z0=	102m	v=	57m/s	x=	21m	y=	0m	g= 11m/s <sup>2</sup>	A= 77°
t=1.800s	z-z0=	107m	v=	56m/s	x=	22m	y=	0m	g= 11m/s <sup>2</sup>	A= 77°
t=1.900s	z-z0=	113m	v=	55m/s	x=	23m	y=	0m	g= 11m/s <sup>2</sup>	A= 77°
t=2.000s	z-z0=	118m	v=	54m/s	x=	25m	y=	0m	g= 11m/s <sup>2</sup>	A= 76°
t=2.100s	z-z0=	123m	v=	53m/s	x=	26m	y=	0m	g= 11m/s <sup>2</sup>	A= 76°
t=2.200s	z-z0=	128m	v=	52m/s	x=	27m	y=	0m	g= 11m/s <sup>2</sup>	A= 76°
t=2.300s	z-z0=	133m	v=	50m/s	x=	28m	y=	0m	g= 11m/s <sup>2</sup>	A= 76°
t=2.400s	z-z0=	137m	v=	49m/s	x=	30m	y=	0m	g= 11m/s <sup>2</sup>	A= 75°
t=2.500s	z-z0=	142m	v=	48m/s	x=	31m	y=	0m	g= 11m/s <sup>2</sup>	A= 75°
t=2.600s	z-z0=	147m	v=	47m/s	x=	32m	y=	0m	g= 11m/s <sup>2</sup>	A= 75°
t=2.700s	z-z0=	151m	v=	46m/s	x=	33m	y=	0m	g= 11m/s <sup>2</sup>	A= 74°
t=2.800s	z-z0=	155m	v=	45m/s	x=	35m	y=	0m	g= 11m/s <sup>2</sup>	A= 74°
t=2.900s	z-z0=	159m	v=	44m/s	x=	36m	y=	0m	g= 11m/s <sup>2</sup>	A= 74°
t=3.000s	z-z0=	163m	v=	43m/s	x=	37m	y=	0m	g= 11m/s <sup>2</sup>	A= 73°
t=3.100s	z-z0=	167m	v=	42m/s	x=	38m	y=	0m	g= 11m/s <sup>2</sup>	A= 73°
t=3.200s	z-z0=	171m	v=	41m/s	x=	40m	y=	0m	g= 11m/s <sup>2</sup>	A= 73°
t=3.300s	z-z0=	175m	v=	40m/s	x=	41m	y=	0m	g= 11m/s <sup>2</sup>	A= 72°
t=3.400s	z-z0=	179m	v=	39m/s	x=	42m	y=	0m	g= 11m/s <sup>2</sup>	A= 72°
t=3.500s	z-z0=	182m	v=	38m/s	x=	43m	y=	0m	g= 11m/s <sup>2</sup>	A= 71°
t=3.600s	z-z0=	186m	v=	37m/s	x=	45m	y=	0m	g= 10m/s <sup>2</sup>	A= 71°
t=3.700s	z-z0=	189m	v=	36m/s	x=	46m	y=	0m	g= 10m/s <sup>2</sup>	A= 70°
t=3.800s	z-z0=	192m	v=	35m/s	x=	47m	y=	0m	g= 10m/s <sup>2</sup>	A= 70°
t=3.900s	z-z0=	195m	v=	34m/s	x=	48m	y=	0m	g= 10m/s <sup>2</sup>	A= 69°
t=4.000s	z-z0=	198m	v=	33m/s	x=	49m	y=	0m	g= 10m/s <sup>2</sup>	A= 68°
t=4.100s	z-z0=	201m	v=	32m/s	x=	51m	y=	0m	g= 10m/s <sup>2</sup>	A= 68°
t=4.200s	z-z0=	204m	v=	31m/s	x=	52m	y=	0m	g= 10m/s <sup>2</sup>	A= 67°
t=4.300s	z-z0=	207m	v=	30m/s	x=	53m	y=	0m	g= 10m/s <sup>2</sup>	A= 66°
t=4.400s	z-z0=	209m	v=	29m/s	x=	54m	y=	0m	g= 10m/s <sup>2</sup>	A= 66°
t=4.500s	z-z0=	212m	v=	28m/s	x=	55m	y=	0m	g= 10m/s <sup>2</sup>	A= 65°
t=4.600s	z-z0=	214m	v=	27m/s	x=	57m	y=	0m	g= 10m/s <sup>2</sup>	A= 64°
t=4.700s	z-z0=	217m	v=	26m/s	x=	58m	y=	0m	g= 10m/s <sup>2</sup>	A= 63°
t=4.800s	z-z0=	219m	v=	26m/s	x=	59m	y=	0m	g= 10m/s <sup>2</sup>	A= 62°
t=4.900s	z-z0=	221m	v=	25m/s	x=	60m	y=	0m	g= 10m/s <sup>2</sup>	A= 61°
t=5.000s	z-z0=	223m	v=	24m/s	x=	61m	y=	0m	g= 10m/s <sup>2</sup>	A= 60°
t=5.100s	z-z0=	225m	v=	23m/s	x=	63m	y=	0m	g= 10m/s <sup>2</sup>	A= 59°

t=5.100s	z-z0=	z-z0m	v=	v0m/s	x=	x0m	y=	y0m	g=	g0m/s <sup>2</sup>	A=	A0°
t=5.200s	z-z0=	227m	v=	22m/s	x=	64m	y=	0m	g=	10m/s <sup>2</sup>	A=	57°
t=5.300s	z-z0=	228m	v=	21m/s	x=	65m	y=	0m	g=	10m/s <sup>2</sup>	A=	56°
t=5.400s	z-z0=	230m	v=	20m/s	x=	66m	y=	0m	g=	10m/s <sup>2</sup>	A=	54°
t=5.500s	z-z0=	232m	v=	20m/s	x=	67m	y=	0m	g=	10m/s <sup>2</sup>	A=	53°
t=5.600s	z-z0=	233m	v=	19m/s	x=	69m	y=	0m	g=	10m/s <sup>2</sup>	A=	51°
t=5.700s	z-z0=	234m	v=	18m/s	x=	70m	y=	0m	g=	10m/s <sup>2</sup>	A=	49°
t=5.800s	z-z0=	236m	v=	17m/s	x=	71m	y=	0m	g=	10m/s <sup>2</sup>	A=	47°
t=5.900s	z-z0=	237m	v=	17m/s	x=	72m	y=	0m	g=	10m/s <sup>2</sup>	A=	44°
t=6.000s	z-z0=	238m	v=	16m/s	x=	73m	y=	0m	g=	10m/s <sup>2</sup>	A=	42°
t=6.100s	z-z0=	239m	v=	15m/s	x=	75m	y=	0m	g=	10m/s <sup>2</sup>	A=	39°
t=6.200s	z-z0=	239m	v=	15m/s	x=	76m	y=	0m	g=	10m/s <sup>2</sup>	A=	36°
t=6.300s	z-z0=	240m	v=	14m/s	x=	77m	y=	0m	g=	10m/s <sup>2</sup>	A=	33°
t=6.400s	z-z0=	241m	v=	14m/s	x=	78m	y=	0m	g=	10m/s <sup>2</sup>	A=	29°
t=6.500s	z-z0=	241m	v=	13m/s	x=	79m	y=	0m	g=	10m/s <sup>2</sup>	A=	26°
t=6.600s	z-z0=	242m	v=	13m/s	x=	80m	y=	0m	g=	10m/s <sup>2</sup>	A=	22°
t=6.700s	z-z0=	242m	v=	12m/s	x=	82m	y=	0m	g=	10m/s <sup>2</sup>	A=	17°
t=6.800s	z-z0=	242m	v=	12m/s	x=	83m	y=	0m	g=	10m/s <sup>2</sup>	A=	13°
t=6.900s	z-z0=	242m	v=	12m/s	x=	84m	y=	0m	g=	10m/s <sup>2</sup>	A=	8°
t=7.000s	z-z0=	242m	v=	12m/s	x=	85m	y=	0m	g=	10m/s <sup>2</sup>	A=	4°
culmination												
t=7.100s	z-z0=	242m	v=	12m/s	x=	86m	y=	0m	g=	10m/s <sup>2</sup>	A=	-1°
t=7.200s	z-z0=	242m	v=	12m/s	x=	88m	y=	0m	g=	10m/s <sup>2</sup>	A=	-6°
t=7.300s	z-z0=	242m	v=	12m/s	x=	89m	y=	0m	g=	10m/s <sup>2</sup>	A=	-11°
t=7.400s	z-z0=	241m	v=	12m/s	x=	90m	y=	0m	g=	10m/s <sup>2</sup>	A=	-15°
t=7.500s	z-z0=	241m	v=	12m/s	x=	91m	y=	0m	g=	10m/s <sup>2</sup>	A=	-19°
t=7.600s	z-z0=	240m	v=	13m/s	x=	92m	y=	0m	g=	10m/s <sup>2</sup>	A=	-24°
t=7.700s	z-z0=	240m	v=	13m/s	x=	93m	y=	0m	g=	10m/s <sup>2</sup>	A=	-27°
t=7.800s	z-z0=	239m	v=	14m/s	x=	95m	y=	0m	g=	10m/s <sup>2</sup>	A=	-31°
t=7.900s	z-z0=	238m	v=	14m/s	x=	96m	y=	0m	g=	10m/s <sup>2</sup>	A=	-35°
t=8.000s	z-z0=	237m	v=	15m/s	x=	97m	y=	0m	g=	10m/s <sup>2</sup>	A=	-38°
t=8.100s	z-z0=	236m	v=	15m/s	x=	98m	y=	0m	g=	10m/s <sup>2</sup>	A=	-41°
ouverture parachute												
t=23.60s	z-z0=	150m	v=	6m/s	x=	98m	y=	0m				
t=32.62s	z-z0=	100m	v=	6m/s	x=	98m	y=	0m				
t=41.67s	z-z0=	50m	v=	6m/s	x=	98m	y=	0m				
t=50.74s	z-z0=	0m	v=	5m/s	x=	98m	y=	0m				

→ coefficient de portance

$$C_{N(\logix)} = 2$$

$$C_{N_1(\text{empennage})} = 4 \times 4 \times \left(\frac{72}{50}\right)^2 \left(1 + \frac{50}{2 \times 72 + 50}\right) \left(\frac{1}{1 + \sqrt{1 + \frac{2 \times 30}{(171 + 20)^2}}}\right) = 20,8$$

$$C_{N_2(\text{empennage})} = 4 \times 4 \times \left(\frac{30}{50}\right)^2 \left(1 + \frac{50}{2 \times 30 + 50}\right) \left(\frac{1}{1 + \sqrt{1 + \frac{2 \times 30}{(70 + 10)^2}}}\right) = 4,2$$

$$C_{N \text{ tot}} = 27$$

→ centre de poussée

$$X_{cp(\logix)} = \frac{7 \times 90}{15} = 42$$

$$X_{cp_1(\text{empennage})} = 350 + \frac{172(171 + 2 \times 20)}{3(171 + 20)} + \frac{1}{6} \left(171 + 20 \times \frac{171 \times 20}{171 + 20}\right) = 482$$

$$X_{cp_2(\text{empennage})} = 539 + \frac{54(70 + 2 \times 10)}{3(70 + 10)} + \frac{1}{6} \left(70 + 10 \times \frac{70 \times 10}{70 + 10}\right) = 645,5$$

→ centre lateral de poussée

$$X_{ccp} = \frac{X_{cp_1} C_{N_1} + X_{cp_2} C_{N_2} + X_{cp(\log)} C_{N(\log)}}{C_{N_1} + C_{N_2} + C_{N(\log)}} = 474,8$$

→ finesse

$$f = \frac{700}{50} = 14$$

→ marge statique