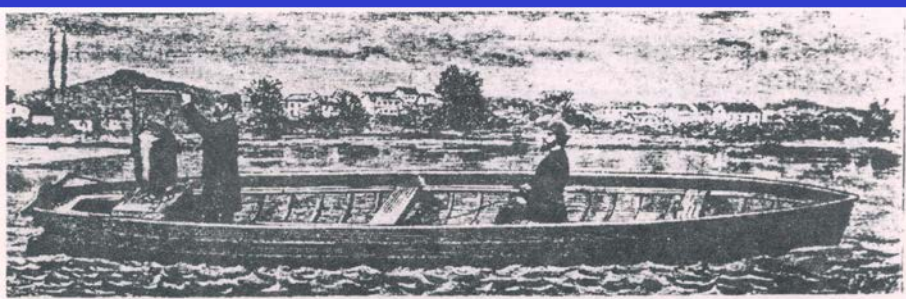




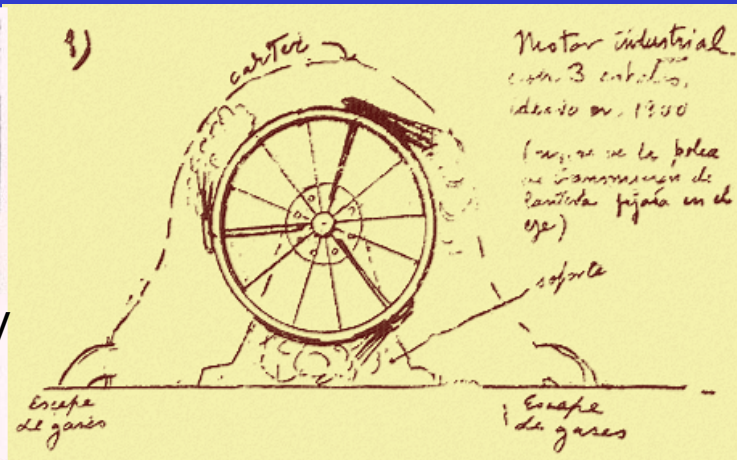
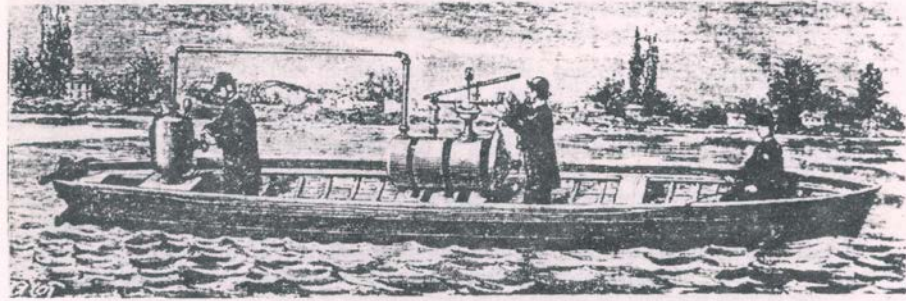
# FUSEES FRANCAISES 1940-1966:

de la *Furia Francese* [Robert Dubernet]  
aux Pierres Précieuses

Philippe Jung  
AAMA, AIRitage, CASP, IAA, IFHE



nitrate ammonium-pétrole Pont de Clichy



1900/01 Pedro Paulet, Paris  
1<sup>er</sup> moteur-fusée à liquides?  
N<sup>2</sup>O<sub>4</sub>-essence



16.3.26 Robert Goddard  
essence-lox 4 daN  
5 kg - 13 m  
1<sup>è</sup> fusée ergols liquides

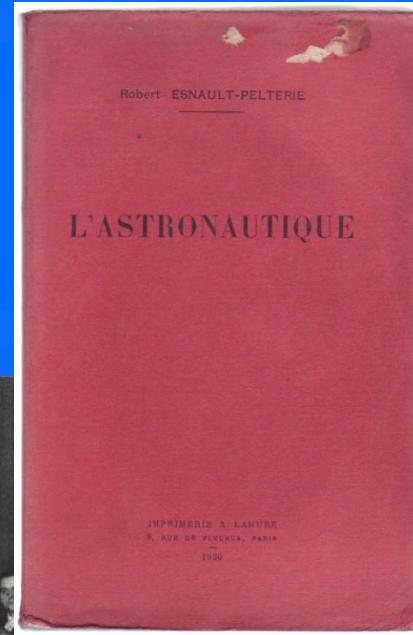
3.8.1886 Ciurcu-Buisson  
1<sup>er</sup> véhicule fusée piloté



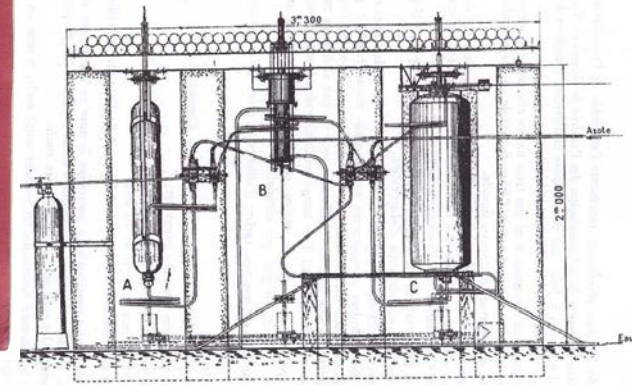
26.12.27 REP  
« astronautique »



IFHE 60 ans 1ers sat français



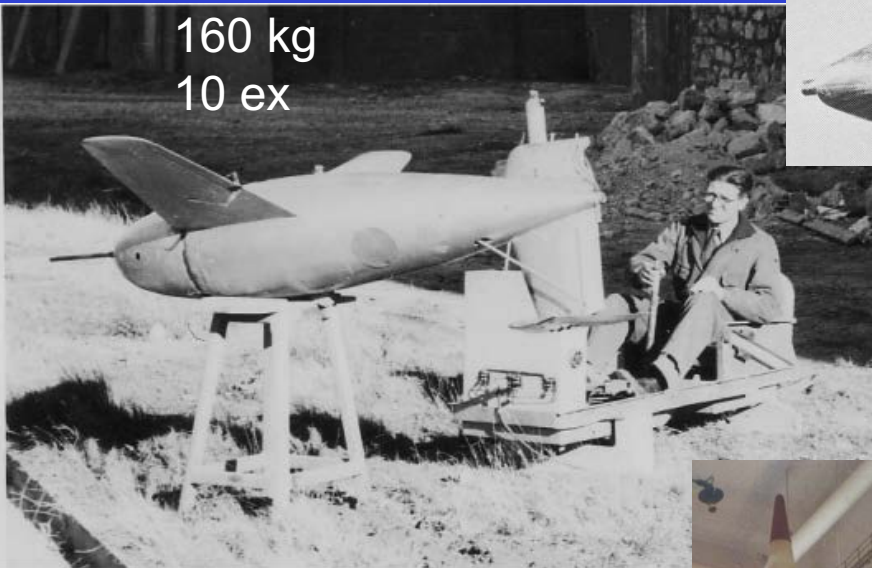
3.30



1934 Satory  
éther de pétrole-lox  
320 daN

1940 Hurel-Turck BHT 38

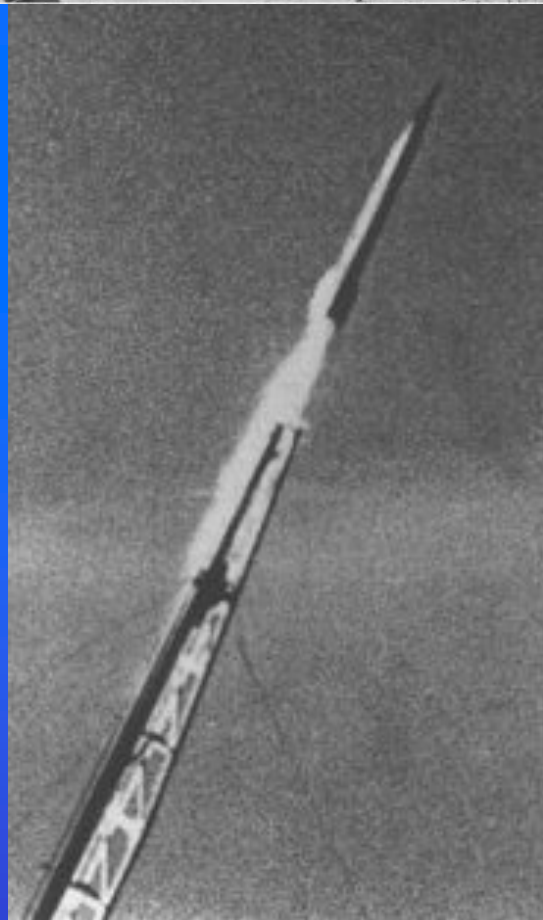
160 kg  
10 ex



3.40 SNCAM  
65 kg  
qq ex



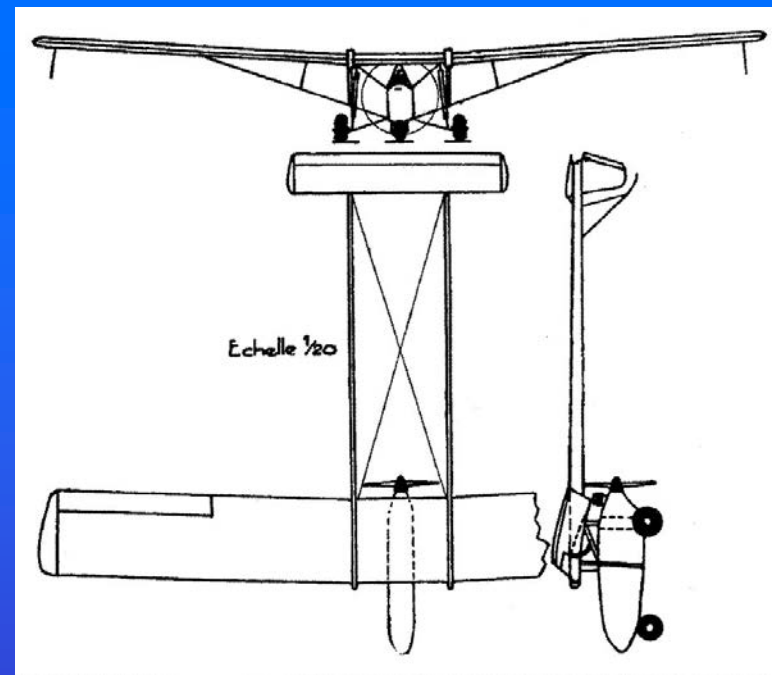
15.3.45 STA EA 1941  
Jean-Jacques Barré  
éther pétrole-lox  
750 daN  
100 kg - d = 60 km  
1<sup>er</sup> Fr à liquides  
8F, 7L



30.1.26



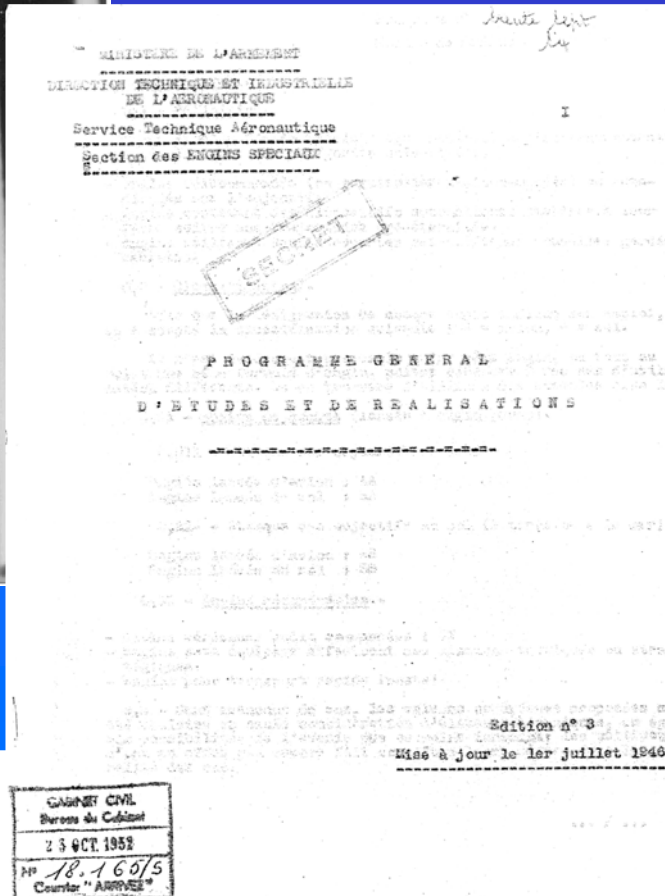
60 ans 1ers sat français



6.46? Hurel Paris-Deauville 3



Michel Decker STAé/ES  
AA-AS-SA-SS-CT-postal



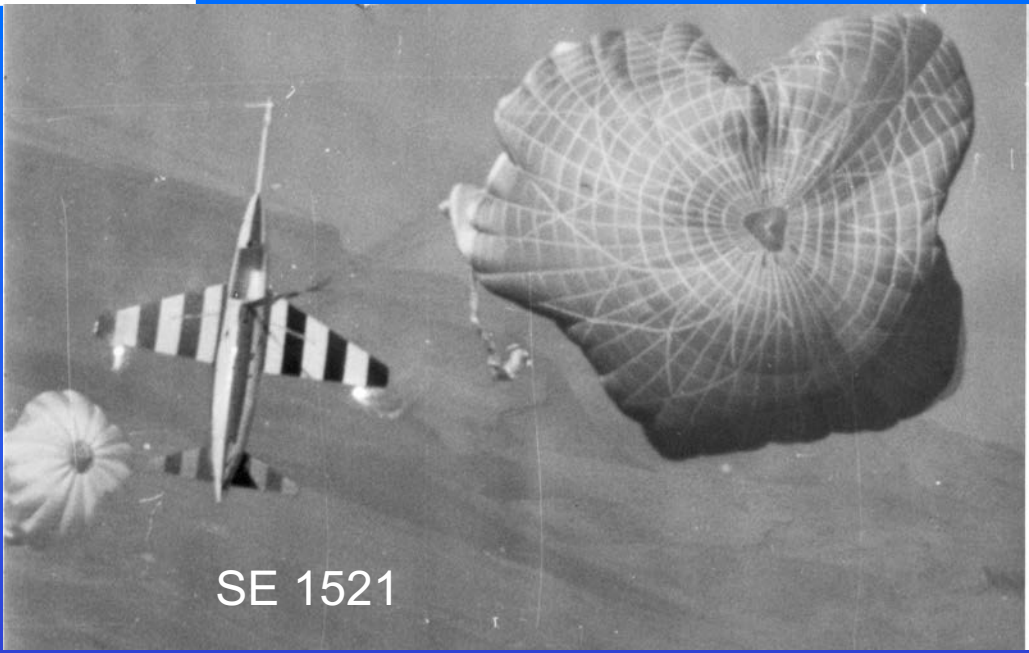
guidage ECA, Turck radio/IR  
télémessure Derveaux  
enregistreur HB  
récup Aératur, EFA



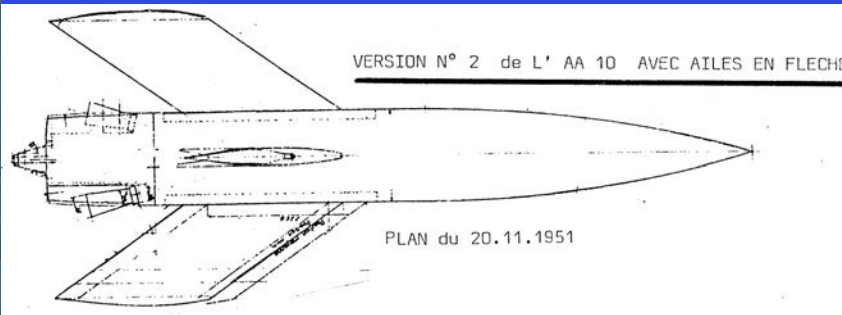
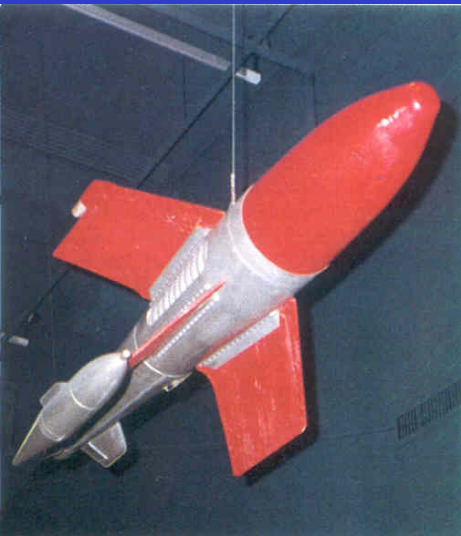
SE 1531  
SEPR 401

1.7.46

7.11.46 SNCASE SE 1500 (CT 10, AS 10)  
650 kg - 450 km/h  
28.10.48 inaugure Colomb-Béchar, 1<sup>er</sup> drone Fr  
13 versions, 118F, 173L



SE 1521

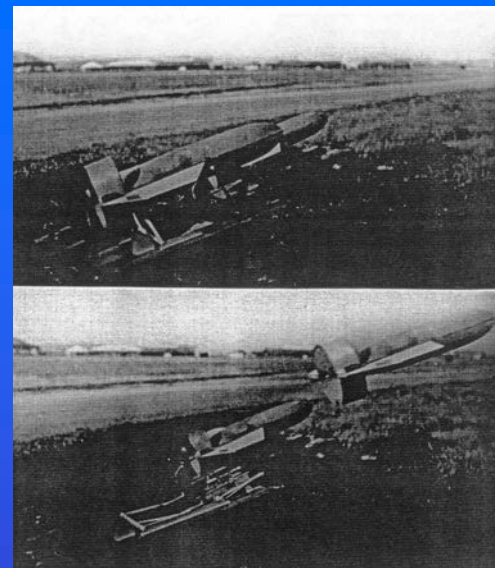


(11.51) Ars 5102



Emile Stauff

12.46 Ars 5101 (AA 10)  
X 4 à SEPR 12 ou 16 1,25 kdaN  
HNO3-tonka (triéthylamine+xylidine)  
filoguidé  
60 kg - M0,9  
200F, ~20L



fin 49 Ars 5202  
filoguidé  
15 kg - 1,6 km  
**début 55 1<sup>er</sup> antichar!**  
29.849F - 9 pays (Isr, Suè, Sui, US)



2.4.49 Arsenal 5501 (CT 10)  
guidage SFENA  
660 kg - 540 km/h  
413F (GB, US)

déb 48 Ars 5201 (SS 10)

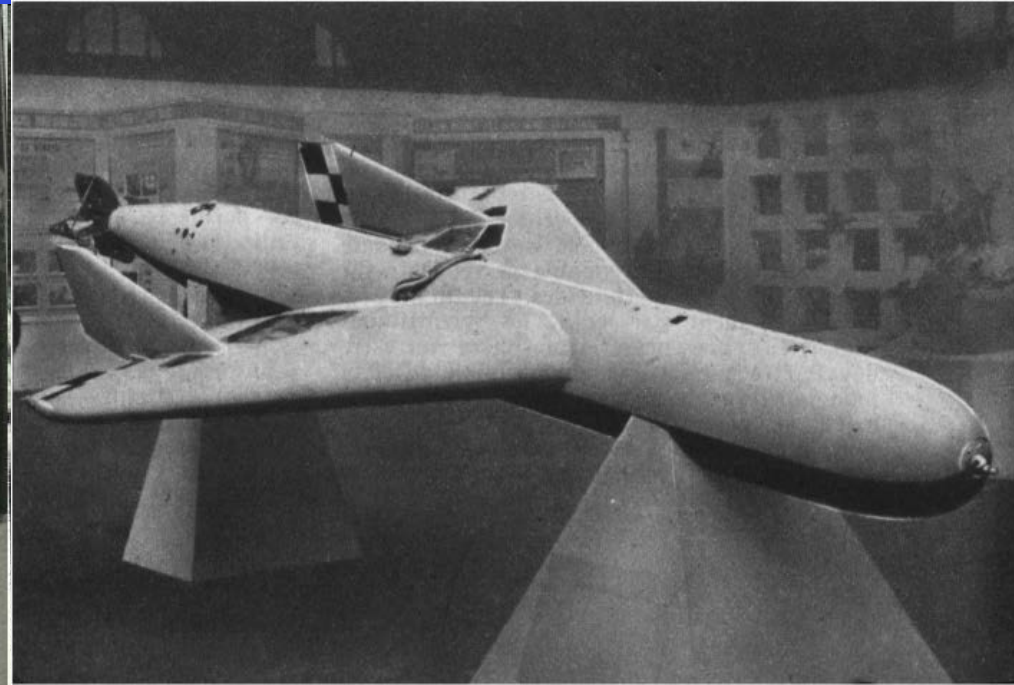
30.1.26

IFHE 60 ans 1ers sat français

# DCCAN



20.8.47 Pluvier (FX 1400)  
filoguidé  
1.570 kg - 280 m/s  
>36 ex



1947? St Tropez L50 Macreuse  
PA  
60L

2.12.48 X8  
radioguid  
M>1  
>4F, >2L

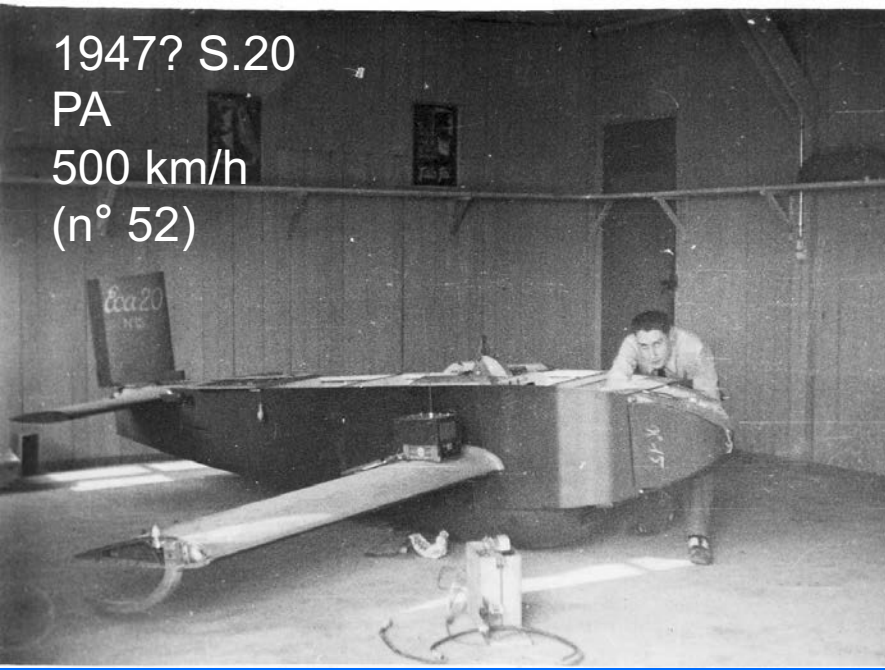
1.48 Brest->Ruelle Palombe  
(Hs 293)  
BMW 109-411 H<sup>2</sup>O<sup>2</sup>-permangan  
radioguid , TV  
1.045 kg - 900 km/h  
76F

1949? torpille autogyre  
PA  
5F, 3L

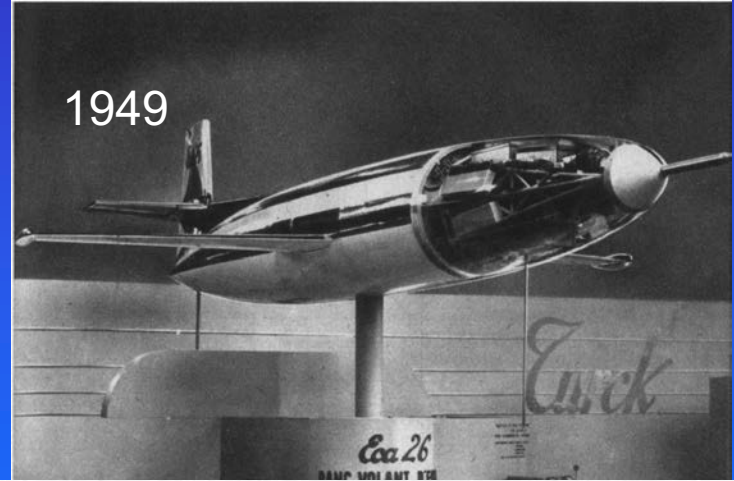


# ECA

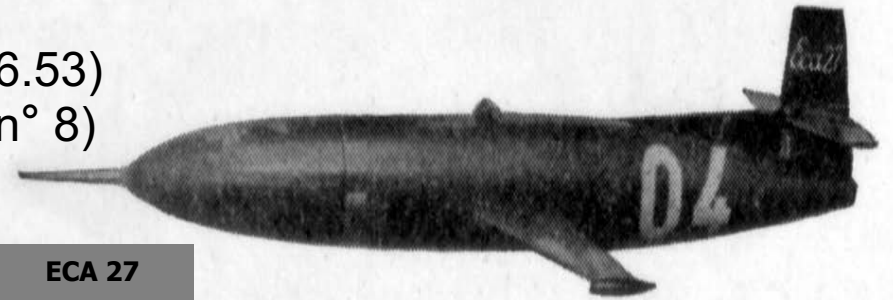
1947? S.20  
PA  
500 km/h  
(n° 52)



1949



(6.53)  
(n° 8)



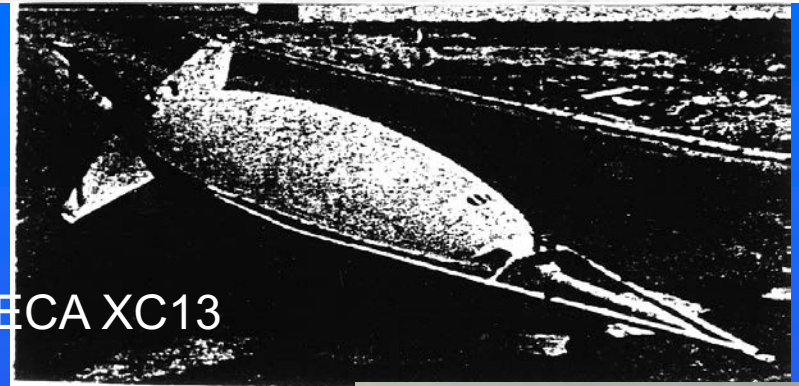
ECA 27

240 kg - 720 km/h - d = 40 km



PA

ECA 57



ECA XC13

ECA 56

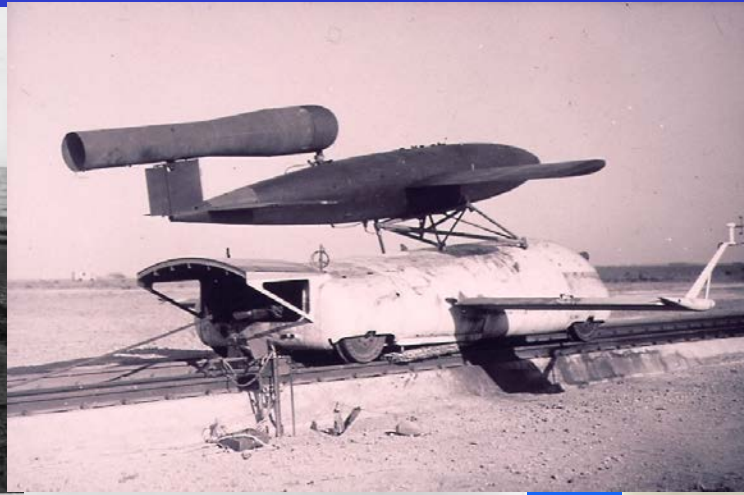


ECA 56 N°06 [GTES - Archive N°61/06 / Clôch N°2 / Date 22.3.61]

ECA 58

60 kg - 290 km/h

1949 ECA T50 (20 ex?)  
(12.2.52) ECA 30 (n° 3)  
(9.53) ECA 21 2+L  
IFHE 60 ans 1ers sat français



28.3.52 SE 1910  
328 km/h RdM!

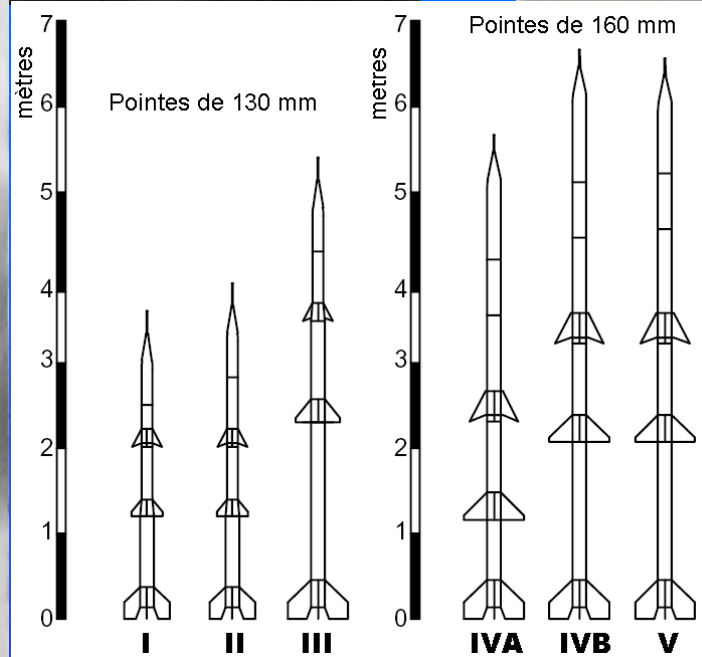
1.49 SE 1900

4+2 SEPR 9 1 kdaN  
H<sub>2</sub>O<sub>2</sub>-CaMnO<sub>4</sub>  
roues Bugatti/Michelin  
support roues SECAN  
télécommande Turck  
enregistrement HB  
4.4 t  
4 ex - 50 essais



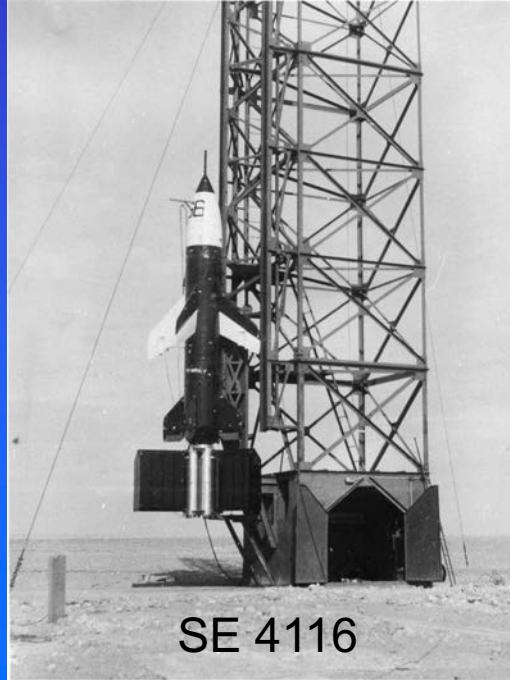
1949 SEPR 35  
1L

->25.2.55 ATEF Monica  
160 kg, h = 180 km  
65F, 15L?





NC 3500



SE 4116



SE 4116 n° 30  
SFENA



Louis Besson



Hans Schneider (1909-1990)

6 standards guidage sur faisceau radar Würzburg  
(Aviac, CNET, ECA, Sadir, SFENA)  
spoilers Kramer, Wagner  
autodirecteur (CSF, Ingber, SFENA)  
alimentation Derveaux  
TM SFENA  
enregistr SFIM  
récup EFA



29.9.49 SNCAC NC 3500/SE 4100 (SA 10)  
SEPR 2/4 1,25 kdaN (HNO3-tonka)  
1.520 kg - 1.000 km/h  
**1<sup>è</sup> fusée française moderne!**  
16 versions, 81F, 78L

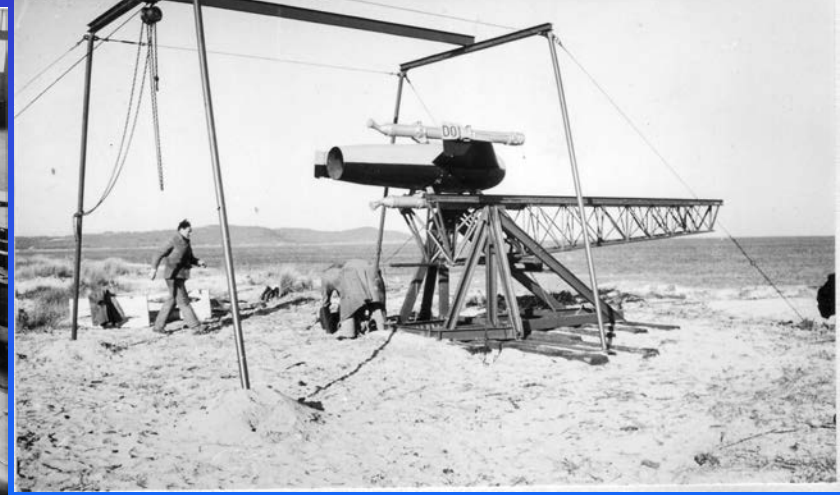
10.5.50  
1er SE 4101 (A03)!



1947 Monthléry



NC 3511



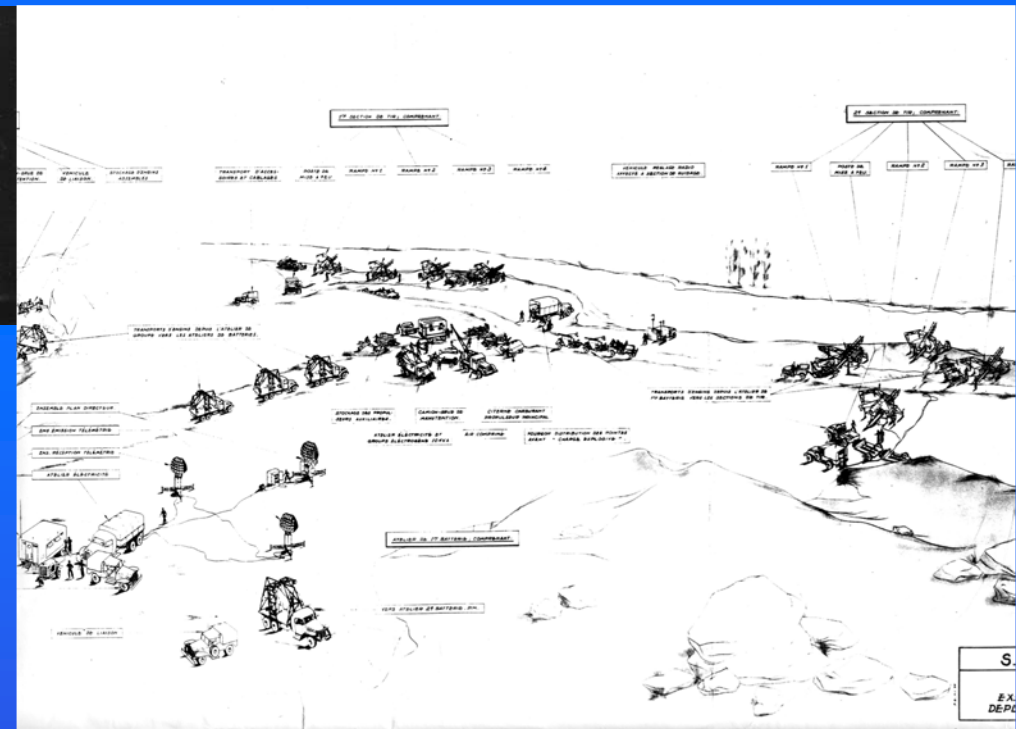
SE 4100 n° 1



SE 4263

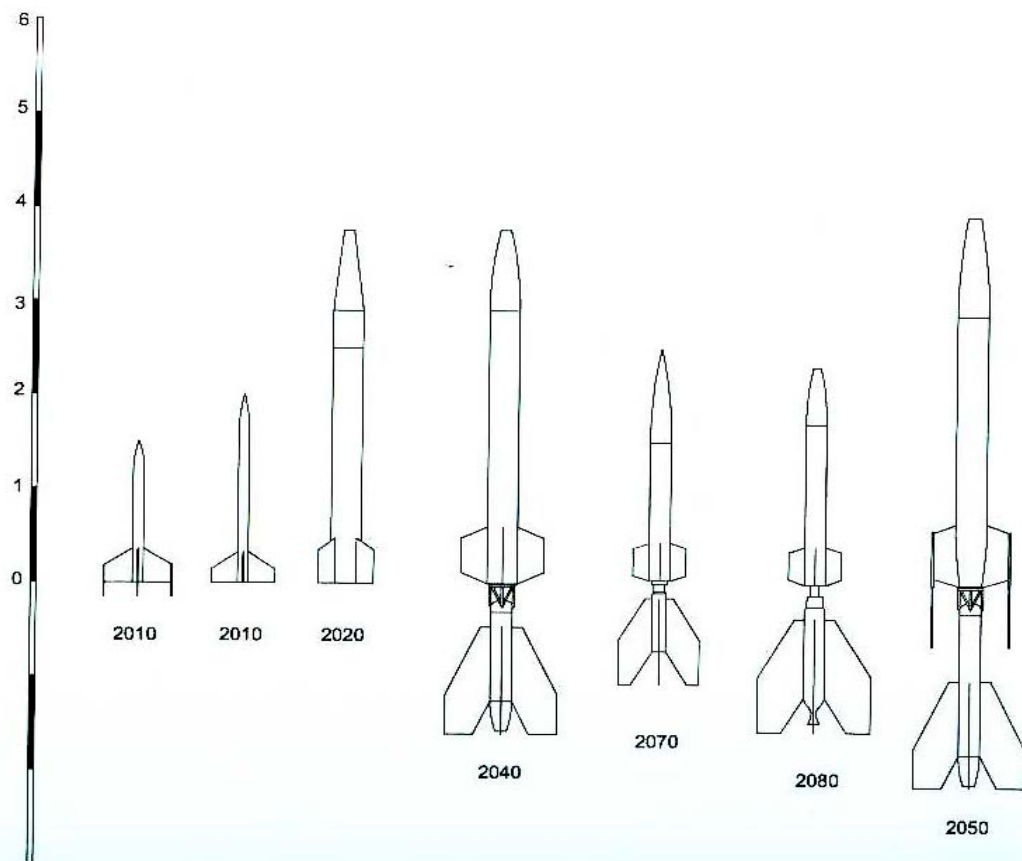


stato 190 daN  
 guidage radar sol (Alkan, CSF, ECA, SFENA)  
 autodirecteur (CSF, ECA, SPALE)  
 alimentation (Andyar, Wonder)  
 brouilleur CFTH  
 TM Turck  
 enregistr SFIM  
 récup (Aérazur, EFA)



8.2.50 SNCAC NC 3510/SE 4200 (SS 40)  
 1.080 kg - 925 km/h  
 8.6.55 1<sup>er</sup> stato opérationnel (701 GAG)!  
 27 versions, 608F, 567L

# ONERA STATOS VIAUD

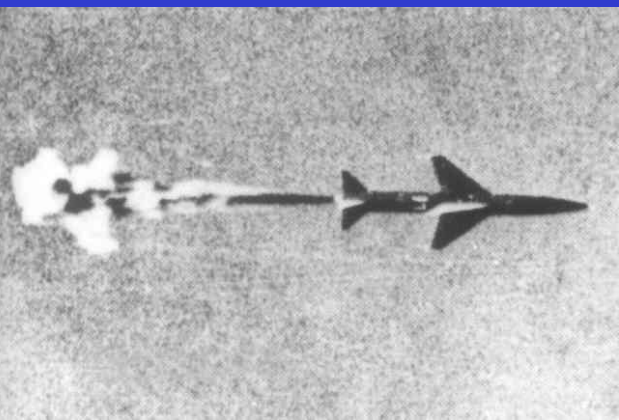


1949 VD 2020  
100 kg - 7L

1948 VD 2010 (22 kg - 20L)  
1950 VD 2070/2080 (40 kg - 3+ L)  
1952 VD 2050 (10+ ex)  
130 kg - M1,8

1950 VD 2040  
100 kg  
7L





4.50 MATRA M04 (SA 10)

SEPR 12

2Q51 1<sup>er</sup> supers euro (M1,4)

PA ECA, MATRA, SFENA, Siemens

460 kg - 1.800 km/h

9L



(26.5.51) MATRA-Brandt Mabranca (SA)  
(n° 33)



5.51 MATRA R.051 (AA 20)  
guidage ECA, MATRA, SFENA, Turck  
autodirecteur Drivomatic, Thomson  
10.54 1<sup>è</sup> interception fr

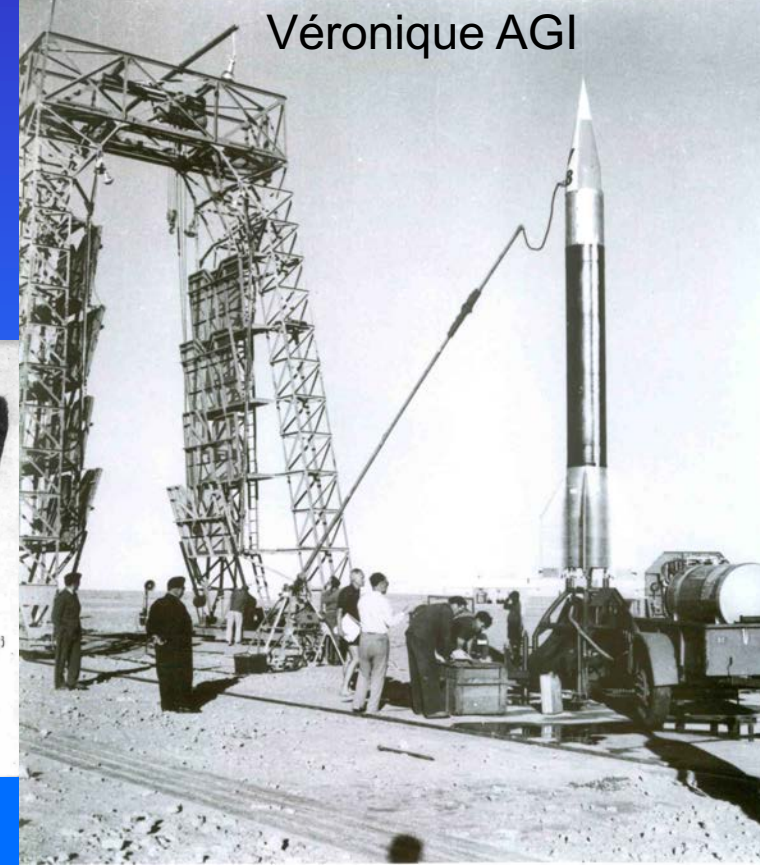


1957 R.510  
autodirecteur Thomson  
184 kg - M1,8 - 7 km  
1.600 ex

# Véronique R



# Véronique AGI



2.8.50 LRBA 4213 Véronique  
 HN03-kérosène  
 ->essence thérébentine  
 4 kdaN->6 kdaN  
 1.930 kg - M1,7  
 21.2.54 135 km 1<sup>è</sup> Fr espace  
 100F, 97L



2.2.61 Hector!



18.10.63  
Félicette

8.50 DEFA 4210 PARCA  
 HNO3-essence 2,25 kdaN ->solide  
 radioguidé  
 1.645 kg - M3,6 – d = 43 km  
 415L



Eléonore





Franz Sernatinger  
(~120 ingénieurs All total!)

déb 51 Marine Ruelle Maruca (Hs 117)  
HNO3-aniline, alcool furfurylique 400 daN  
guidage radio, radar  
525 kg - M0,85 - d = 22 km  
200F, >65L

Maruca A6

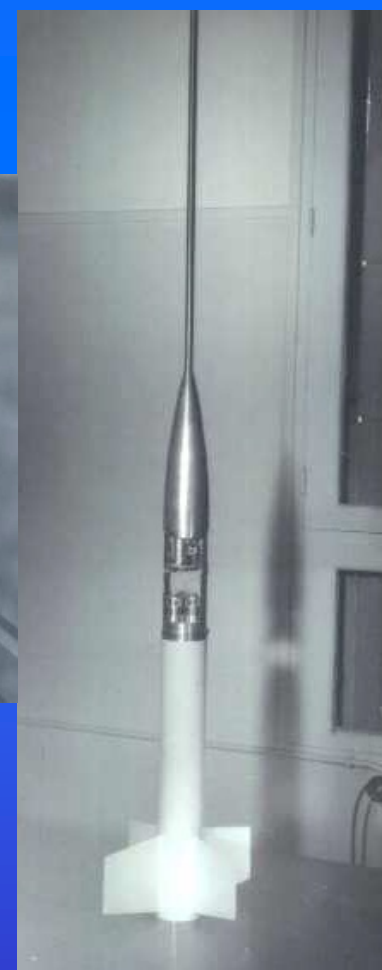


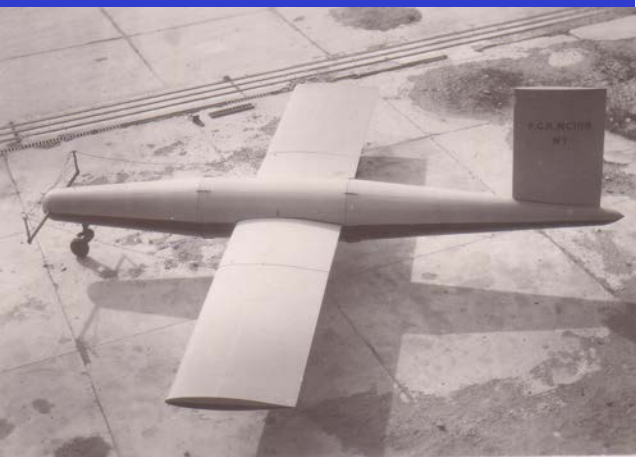
11.51 ONERA OAV-200  
SPRA 6  
250 kg - M1,4  
15L



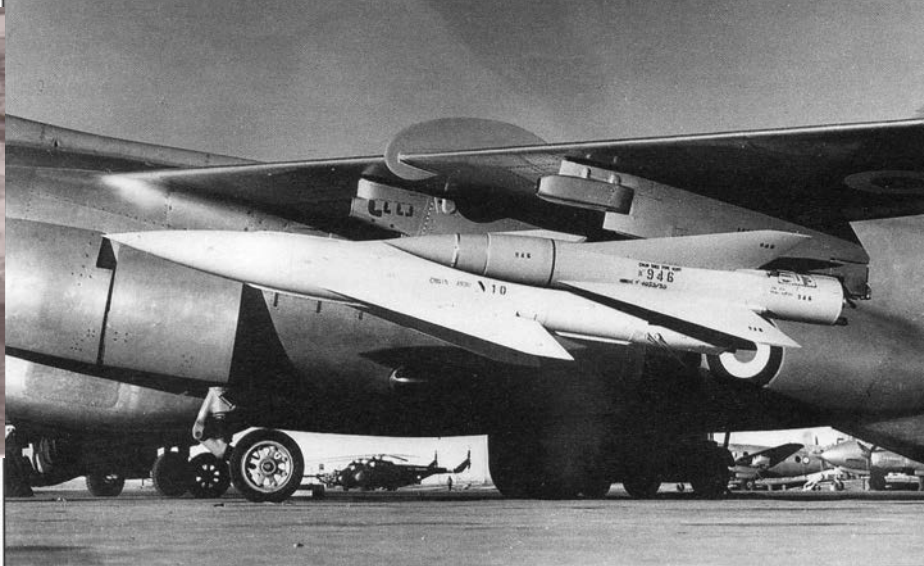
OPd 80 NV

2Q52 OPd 80  
STRIM 750  
21 kg - M1,3  
128+ L





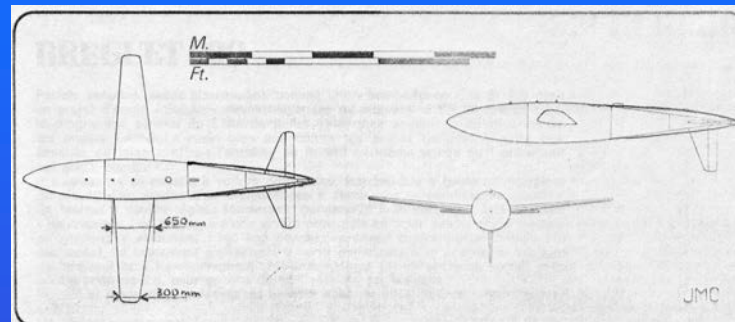
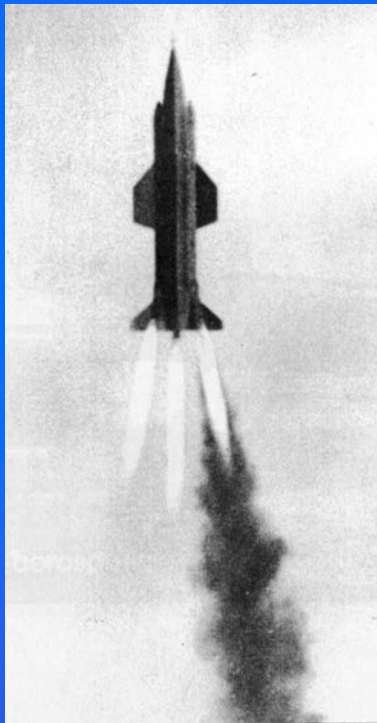
déb 52 NC 1110  
360 kg - 580 km/h  
3 ex



2.52 Ars 5103 (AA 20)  
radioguidé (Derveaux)  
135 kg - 4 km - M1,7  
N 5110 (AS 20)/ C20  
156 km - 7 km

5.56 1<sup>er</sup> AA européen, 3<sup>e</sup> monde  
7.737F - 5 pays

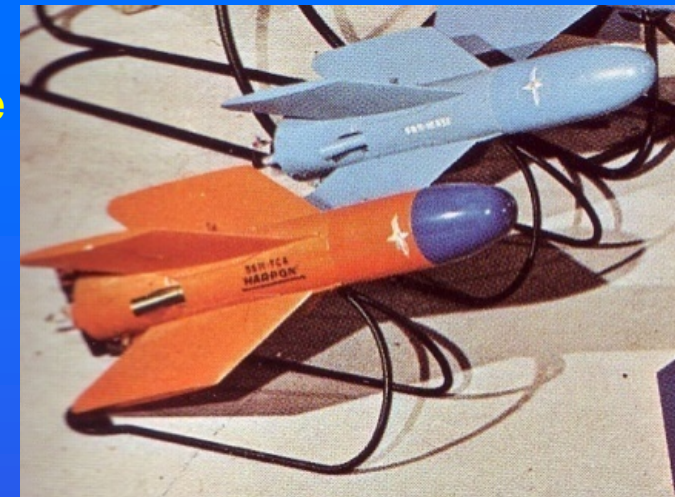
1958 MATRA: AA



1952 Breguet 910  
radioguidé  
1,36 t - 800 km/h - d = 50 km  
6F  
IFHE 60 ans 1ers sat français

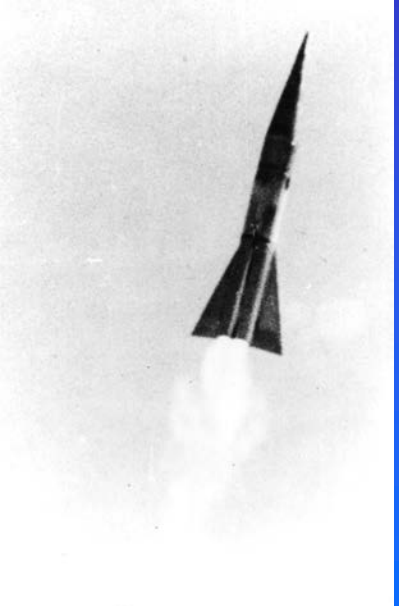


1952 DEFA ENTAC  
12 kg - 1,8 km  
119.417F - 12 pays  
prod Nord



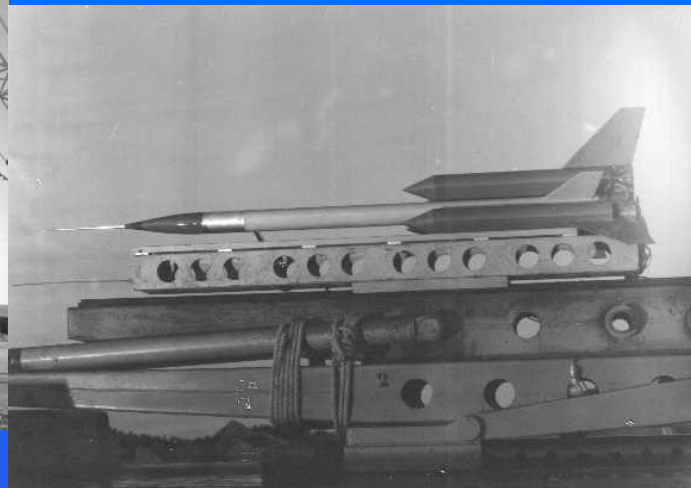
12.53 Ars 5210 (SS 11)  
filoguidé+Turck IR  
30 kg - 500 km/h - d = 7 km  
180.304F - 34 pays

9.52 MATRA R.04 (SA 10)  
4 SEPR 43 1,25 kdaN+ 1 SEPR 44 1,5  
kdaN  
HNO3-tonka  
3F, 2<sup>e</sup> 0.1.26



1953 SEPR 50  
pour R.062 (AS 20)  
2L?

1953 OPd 100  
DEFA + SERAM T10  
56 kg - M3  
20+ ex L



22.11.52  
EA 1951/LRBA 4211 Eole  
lox-alc éthy 9+ kdaN  
1,8 t - 1.130 km/h  
2L

1953 OPd 10-12D  
3 DEFA + T10  
109 kg - M2,4 - H = 30 km  
1L

1953 OPd 200  
STRIM 750  
47 kg - M1  
11 ou 12L

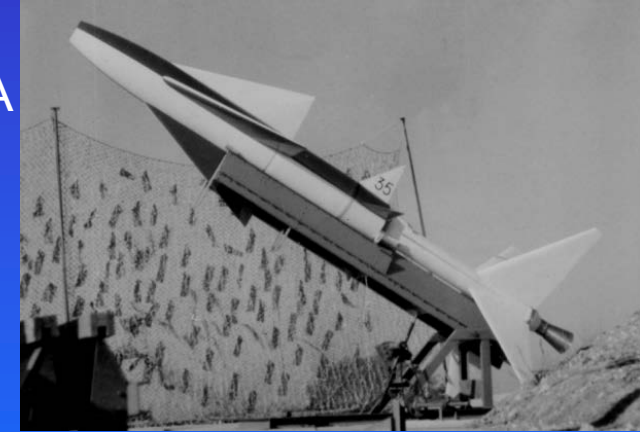


OPd 220P

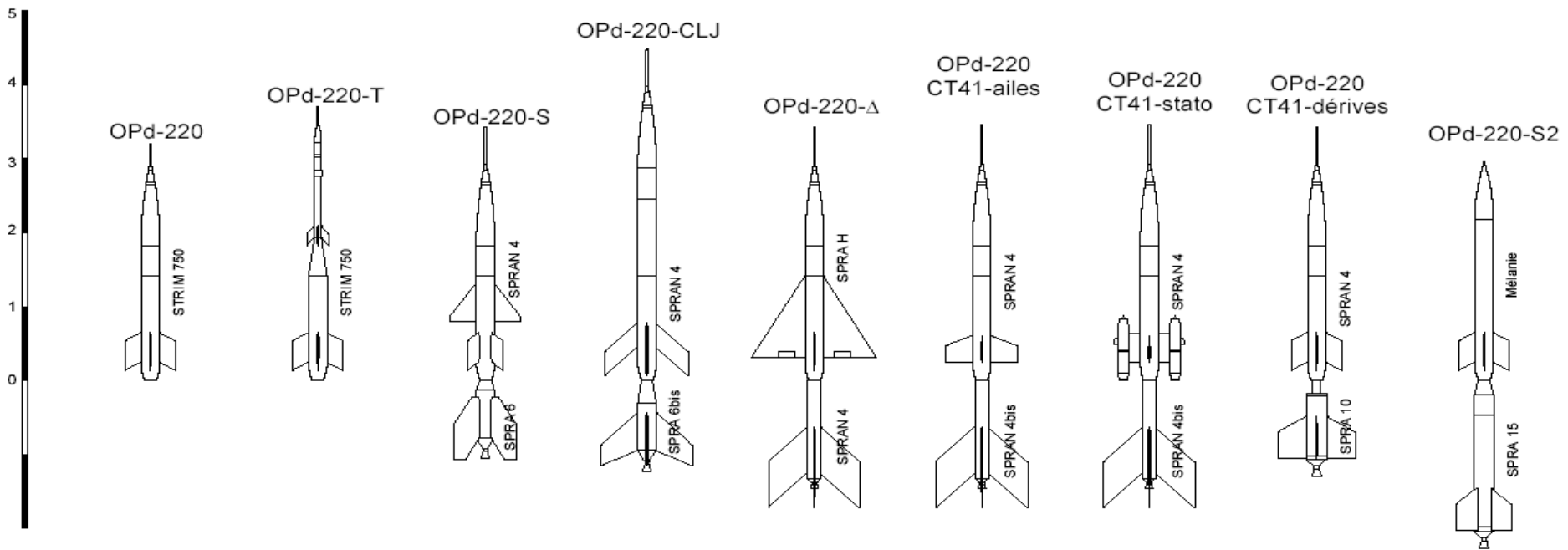


OPd 220-CT 41

fin 53? OPd 220  
SERAM, STRIM, SPRA  
230 kg - M1,9  
86+ L



(17.12.53) Laté Masalca MS  
Popeye ou Vénus  
radioguidé  
530 kg - M2,5 - d = 100 km  
138F, 131L





27.2.54 SE 4300 (SA 11)

mot Maruca

1.225 kg - M0,85 h = 23,5 km

25.5.56 CEAM/SDTA

1<sup>er</sup> SA Fr pré-opérationnel

175F, 125L



guidage radar sol (CNET/CSF

Pénélope, SFENA 127, ECA)

autodirecteurs (CFTH FS, SFENA AD148,  
ECA 421 & ADO optique)

télécommande (Derveaux Caron, Turck)

transpondeur (CSF RP)

enregistreurs (SFIM A15, 22, 23)

1954 OPd 320

SPRA-20 + SPRA-10 ou 15 + SPRA H

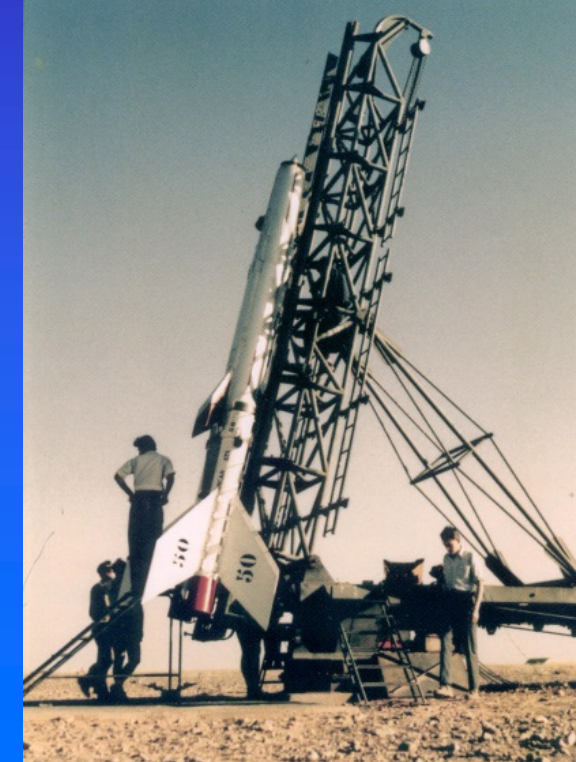
850 kg - M5 - h = 120 km

17+ L



30.1.26

IFHE 60 ans 1ers sat français



10.54 ST 450

2 SPRA?

PA

265 kg - M3,8 RdF

84L

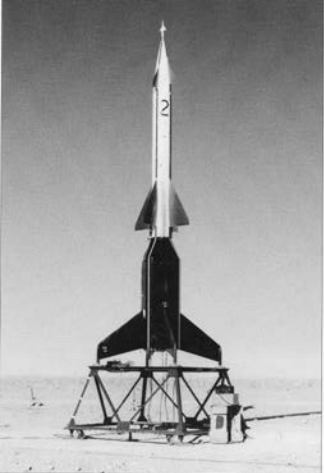


1954 DEFA NA 150, NA 250

PA

M3 - 20.000 m

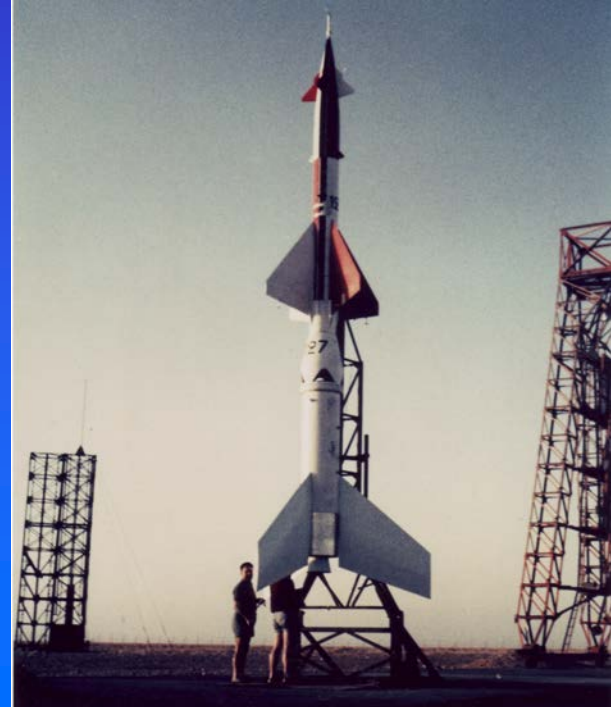
40L



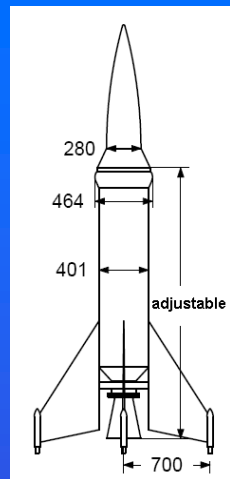
4.9.54 SO 9000  
SEPR 63 3kdaN (HNO3-furaline)

2.5.58 RdM 24.217 m!  
23.7.58 RdE M2,17

11.54 R422 (SA 20)  
guidé Derveaux Ulysse, SFENA  
autodirecteur SFENA  
1,6 t - M2,6 - d = 50km  
2 versions  
185F, 161L



1952 M.042  
STRIM  
12F, 9L  
5.53 R.042  
SEPR 50 + STRIM  
M2,5 - 30.000 m  
12F, 9L

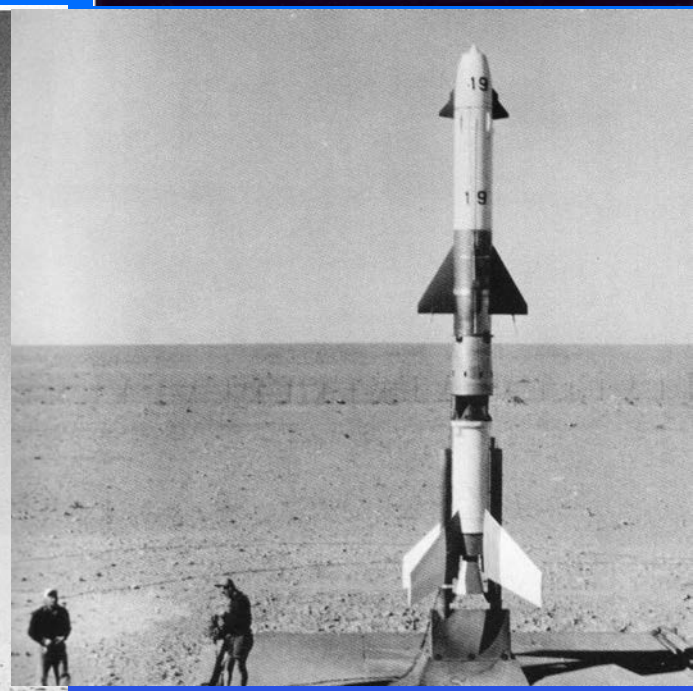


6.55 R.045  
ess SEPR 504  
11L  
30.1.26

5.56 R.046  
ess SEPR 73  
5L



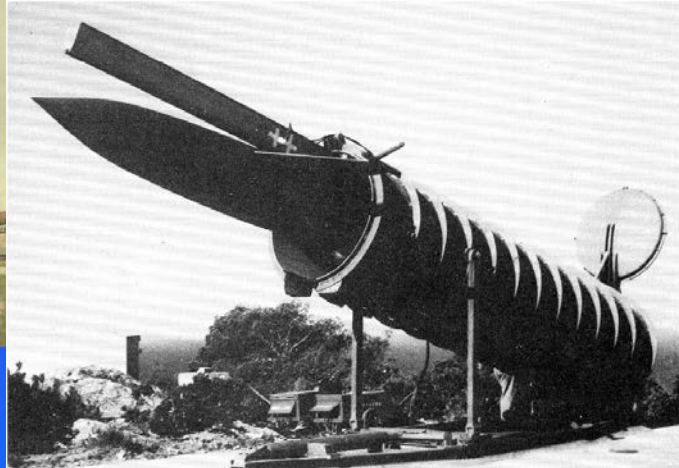
11.54 M.043  
STRIM



R.431  
1,43 t - M3,3  
62F, 45L



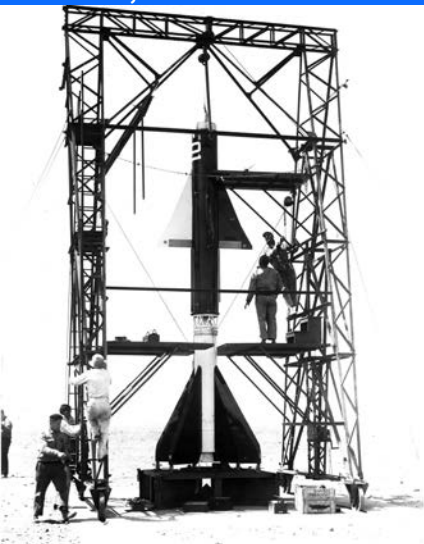
10.1.55 Laté 258 Malaface  
HNO<sub>3</sub>+alc.furfuryl.120 daN  
radioguidé  
1.430 kg - M0,8 - d = 50 km  
10F, 13L



Laté 258H



Laté 110  
Marboré II 300 daN



4 pays + OTAN  
guidage SFENA  
TM Turck  
1.569F

1.55 N 5510 (CT 20)  
Marboré VI 480 daN  
radioguidé  
1.100 kg - 950 km/h - 250 km

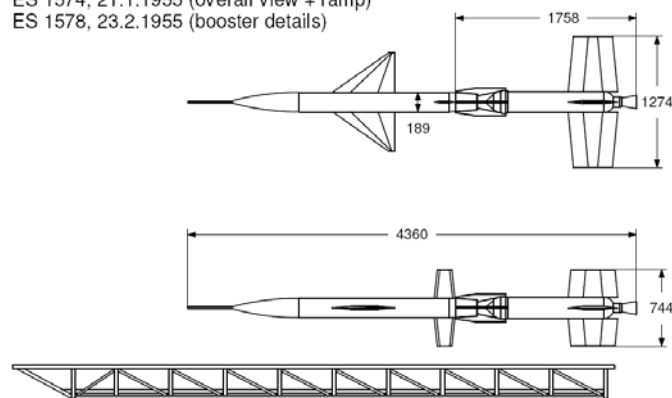
8.10.55 SE 4400 (SA 20)  
1.225 kg - 2 versions

RdM: 8.10.55 M3,15 - 10.3.61 67.000 m!

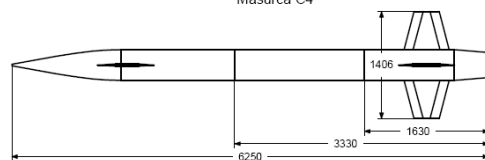
97F, 92L  
guidage (CSF Pénélope, ECA, SFENA)  
autodirecteurs (CFTH FS, SFENA AD 148)  
télémetrie Turck

mi 55? MATRA R.062 (AS 20)  
radioguid  
1 t

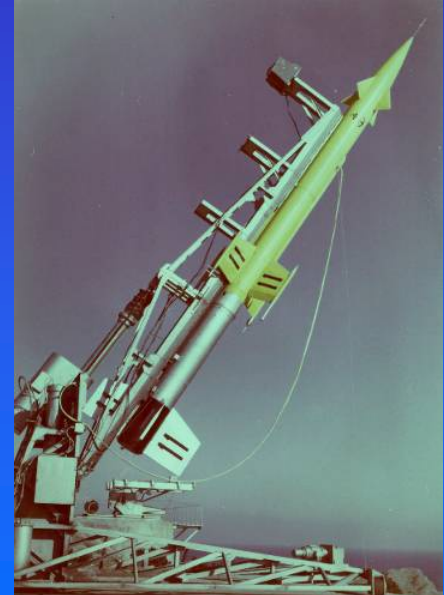
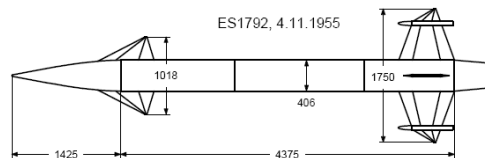
ES 1574, 21.1.1955 (overall view + ramp)  
 ES 1578, 23.2.1955 (booster details)



Masurca C4



ES1792, 4.11.1955



9.55 Ruelle Masurca C1R  
 21F

C4: HNO<sub>3</sub>+N<sub>2</sub>H<sub>4</sub> ou aniline  
 7+F

C6/Mq 1  
 guidé radar

1.490 kg - M2,5 - h = 21 km - d = 25 km  
 147F

(Mq2 20.7.68 ops)

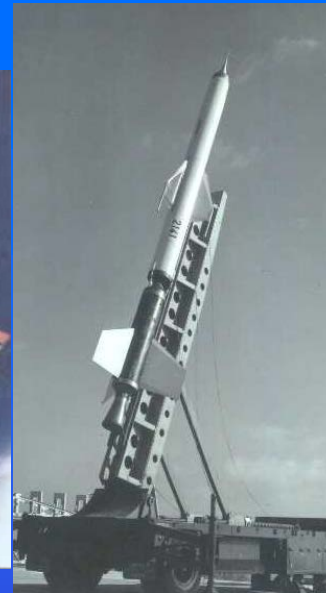
78L



1955 OR-180L  
 450 kg - M1,4  
 93L



8.11.56 OPd 250  
 331 kg - M0,96  
 6L

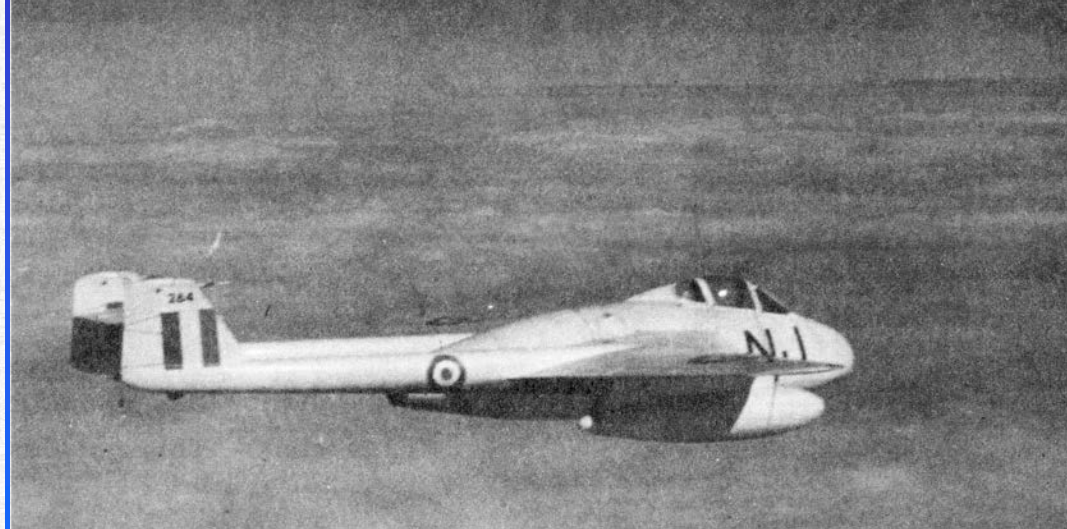
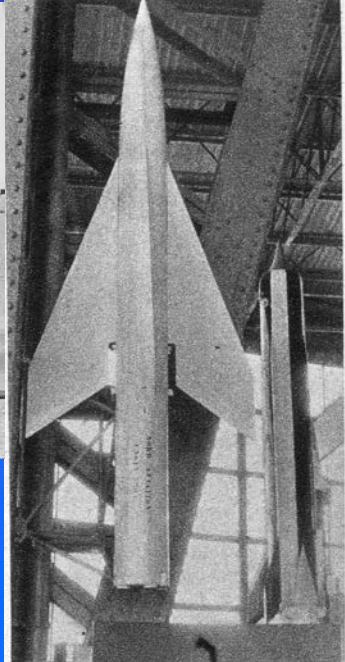


1956 VD 2140  
 M3  
 10L



1957 VD 2120  
 721 kg - M2,5  
 6L

6.56 MWDP!



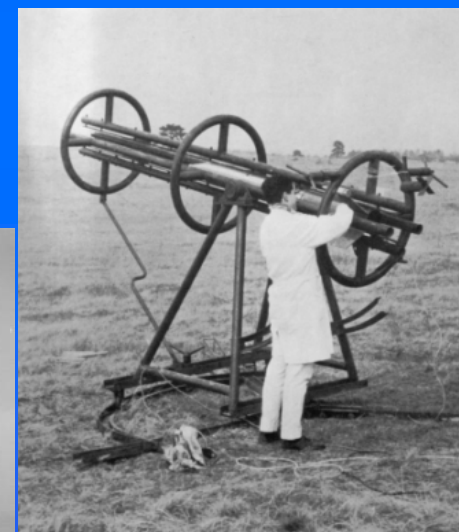
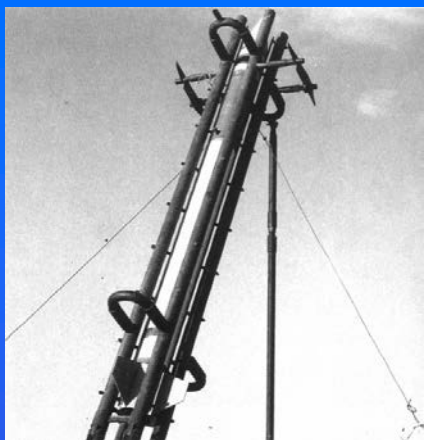
10.10.56 SE 4500  
guidé radar SFENA, CSF  
TM Turck, récup EFA  
1.900 kg - M0,8  
67F, 62L->GTC **1.147 tirs total**

12.10.57 Vampire/Mistral  
TC Turck

22.5.58 1<sup>è</sup> interception (Ars 5103)  
44F

1.56 ATEF 49  
50+ L

1956? N 5301 ACAM (SA)  
radioguidé  
480 kg - 600 m/s - d= 12 km



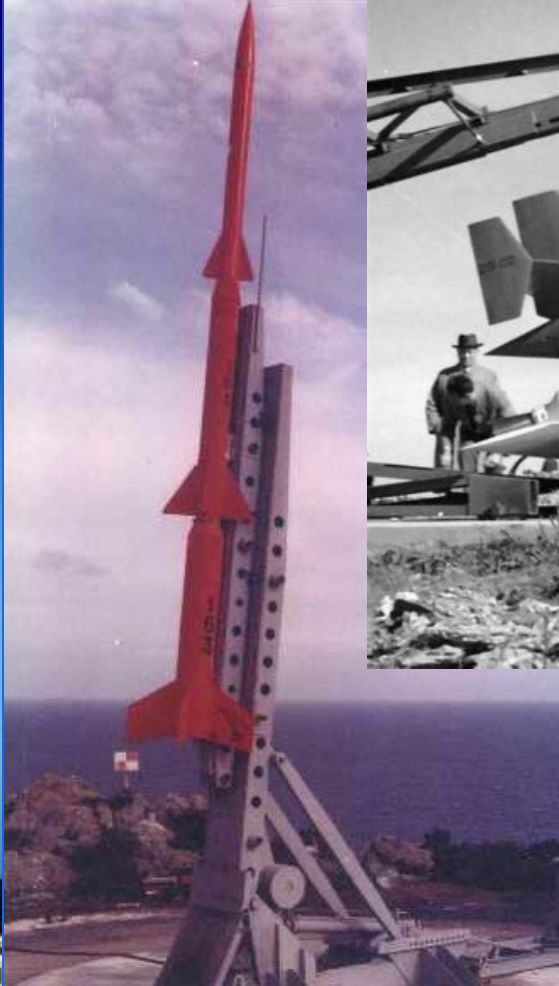
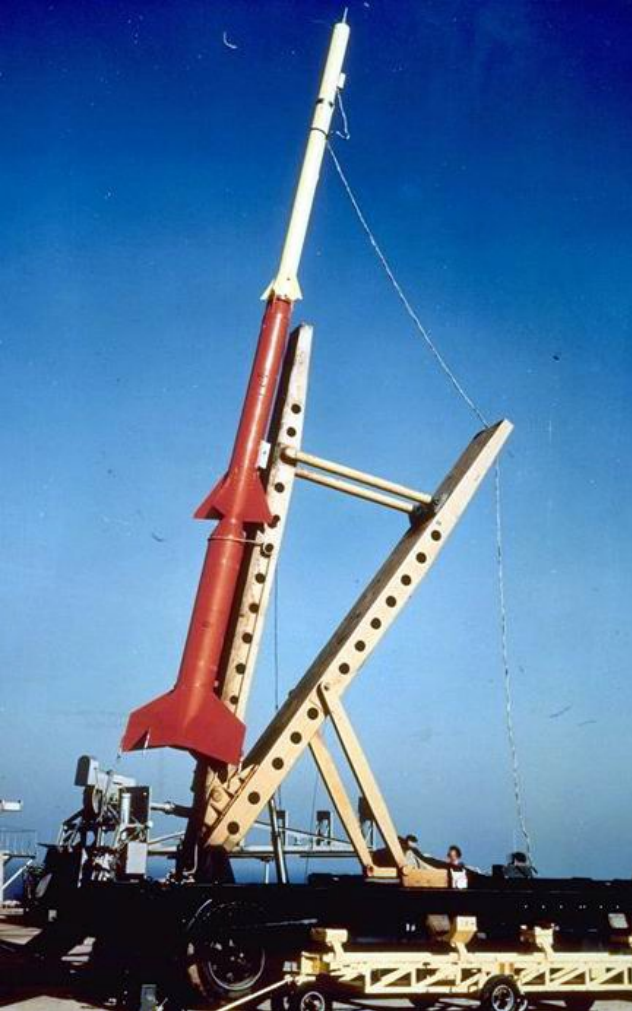
1959 ATEF 64  
fumigène  
4.000 m  
dizaines?  
30.1.26

1959 ATEF 66  
cible  
IFHE 60 ans 1ers sat français

? ATEF 72  
cible  
274 kg

1959 ATEF 74  
club

1959 ATEF 75  
MTO  
2 étages



2.58 Laté 231 Malafon  
2 Vénus  
radioguidé  
1.450 kg - 750 km/h - d = 15 km  
400L

28.11.57 OPd 220 Ardaltex  
SPRAN-50 + Jericho II  
735 kg - M 2  
7L

27.1.58 OPd 220ARD/29-32 Daniel  
828 kg - M5,1 - h = 130 km  
3L

6.7.58 DEFA/ONERA Statex 500  
PA  
1.650 kg - M3,4 - 20.000 m  
10+ F, 10L

1958? OPd 24-22/B

23.12.58 Polytechnique Gyroquette  
(ballon « Rockoon »)  
SEPR 89  
3L





1.59 Nord CT 41 Narval  
 stato Sirius 6 kdaN  
 3 t - M3  
 62F, 29L (GB, USN)



10.4.59 Nord SS 12  
 Achille 150 daN+ Hermione 400 daN  
 75 kg - 335 km/h - 6 km  
 6.010F (5 pays)



10.59 Nord Vega (SA)  
 stato 630 daN  
 PA  
 M4,2 - h = 33 km - d = 200 km  
 18F, 17L



4.12.59 N 5401 (AS 30)  
 Epervier 5,4 kdaN->Lynx + Psyché  
 520 kg - M1,7 - d = 13 km  
 4.806F (8 pays)

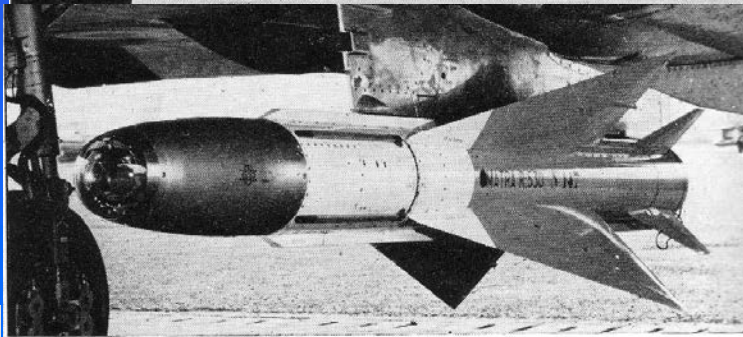
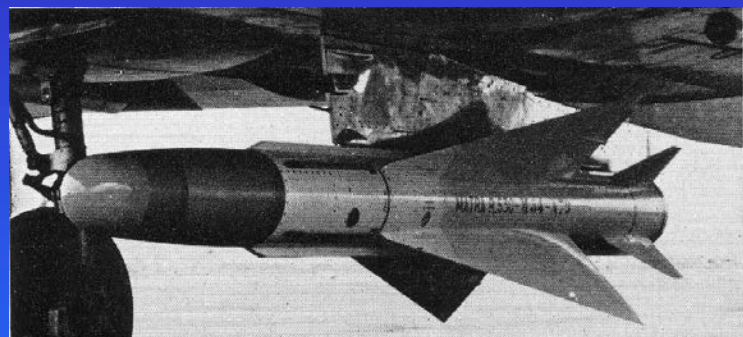


2.5.59 OPd 56 29 32/D Antares  
 1.785 kg - M7 - h = 280 km  
 13L

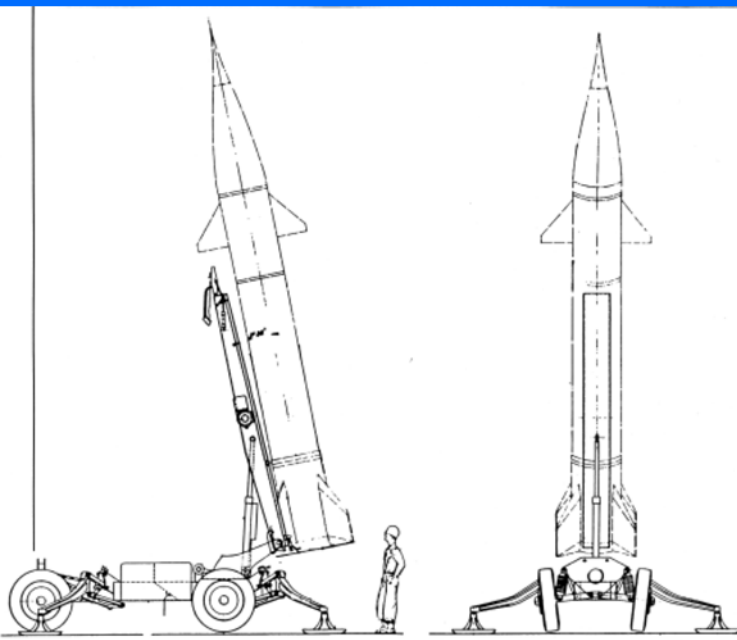
1959? N 5104 (AA 25)



6.5.59 Mirage IIIA-02  
SEPR 841->844 1.680 daN  
HNO3-tonka->kérosène



fin 59 MATRA R.530 (AA 26)  
H-Br Marie-Antoinette 8,5 kdaN  
autodir EMD, SAT  
195 kg - M2,7 - 18 km  
8.500F (14 pays)



10.58/10.59 SE 4600/X 407 Casseur (SSBT)  
NA 801 Mammouth  
3,5 t - M3,22 - d = 100 km

30.1.26

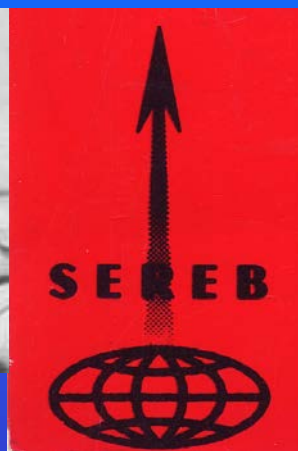


Roger Béteille



Charles Cristofini

IFHE 60 ans 1ers sat français



17.9.59 **SEREB**

- Sud Aviation
- Nord Aviation
- SEPR
- Matra
- Dassault
- SNECMA
- ONERA
- Service des Poudres
- CEA

- \* politique de prototypes tous azimuts (sauf SS longue portée): 98 programmes!
- \* 1<sup>er</sup> anti-char, 1<sup>er</sup> stato opérationnel
- \* débouche sur records du monde et exportations mondiales
- \* toutes les techniques de base de la fusée: architecture, propulsion solide/liquide, guidage EM/IR, télémessure, récupération (sauf inertiel)
- \* tissu industriel avec maîtres d'œuvre (Nord & Sud surtout), sous-systémiers (LRBA, SEPR, ...) & équipementiers (Turck, SFENA...)
- \* clients étatiques, moyens de recherches & essais
- \* faible influence allemande initiale (~120 au total, transférés de 9.56, conseillers en propulsion liquide, guidage et aérodynamique: Sernatinger, Schneider, Kramer, Bringer,...)

politique IV<sup>e</sup> République des protos  
engins = avions!  
mais secret et personne à bord!

1.1.60: M7 - h = 280 km (Antares)

Client	Programmes
Air	35
Marine	28
ONERA	20
Terre	8
Hurel/SEPR/AL	3
CASDN	1
Polytechnique	1
CEA	1
Météo	1
Total	98

Clients: STAé, DCCAN, DEFA

Moyens d'essais: EAT, LRBA, ONERA, St Cyr

Industriels: maîtres d'œuvre (DEFA, ECAN, Laté, MATRA, SNCAN, SNCASE)  
équipementiers->

structure métallique, composite (SE 4242 1955)

propulsion solide, liquide, stato (ECAN, H-B, LRBA, ONERA, PN, SNCAN, SNCASE, STRIM)

guidage/pilotage (Alkan, Aviac, CNET, CSF, ECA, SFENA)

autodirecteurs e-m, optique (Drivomatic, ECA, Ingber, CFTH, SFENA, SPALE, Turck)

puissance (Andyar, Wonder)

moteur électrique (Bronzavia)

TM/TC (Caron, Derveaux, Marcoussis, Turck)

enregistreur (SFIM)

brouillage (CSF)

récupération (Aérazur, EFA)

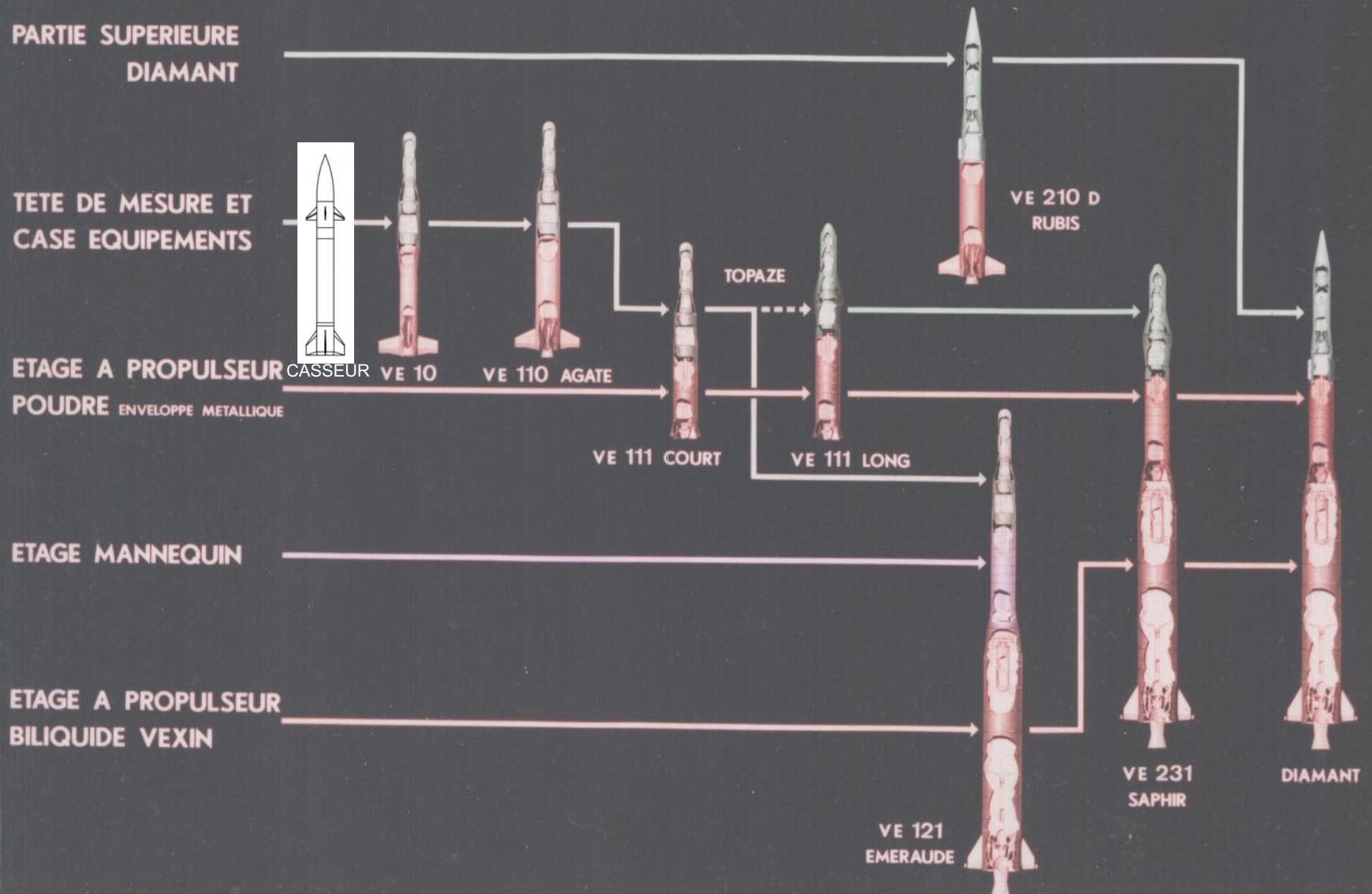
calculateur SEA

radar sol (CSF)

2 grands pôles: Cannes, Châtillon

plus: RP, Ruelle, Toulouse

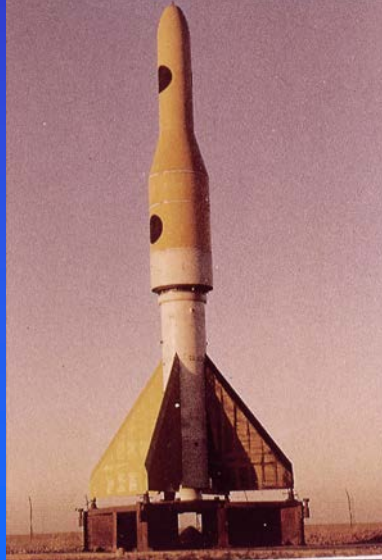
# FILIATION DES VEHICULES D'ESSAI



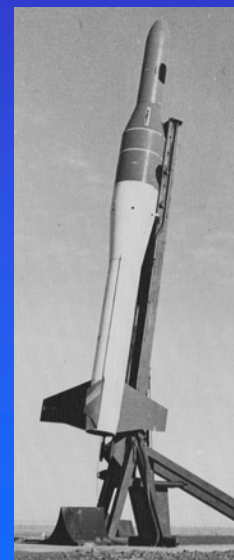
EBB Etudes Balistiques de Base (Robert Laurentjoye)



19.10.60 VE 8 (Ogive P)  
360 kg - M0,92  
5F, 11L



12.11.60 VE 9  
SEPR 732  
1.682 kg - M1,54 - h = 6,7 km  
2F, 2L, 4 récup



17.12.60 VE 10/  
X 408 Aigle  
SEPR 737 Stromboli  
case version A, A', D  
2.225 kg - M3,2 - h = 19 km  
4F, 4L



5.4.63 VE 10A  
TM Ajax (v J)  
2F, 2L



3.6.61 VE 110 Aigle II->Agate (1963)  
NA 801 Mammoth  
version E, F, H  
3,2 t - h = 65 km  
9F, 8L, 16 récup!



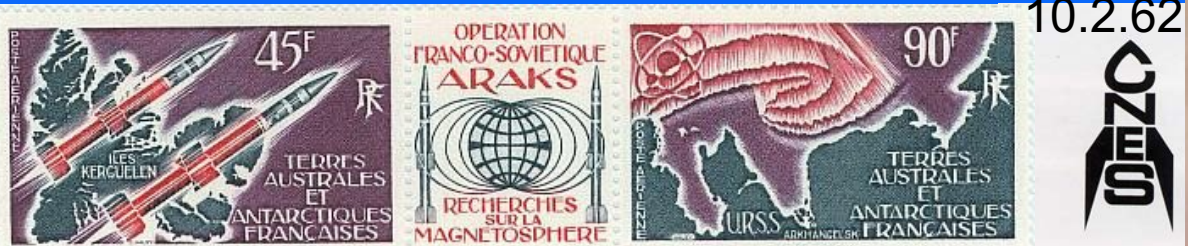
19.11.63 VE 110RR (ogive O)  
4F, 4L, 1 récup, 1 explos

28.11.60 ONERA Stalaltex  
**1<sup>er</sup> hypersonique (M4,96+)**  
30.1.26 8L



22.3.67 Dauphin  
 1.169 kg  
 6.300 km/h  
 150 km

Dragon 5.12.62 412kg - 6.120km/h - 150km  
 Centaure 27.5.61 576kg - 6.652km/h - 180km  
 Béliér 24.5.61 1.352kg - 12.280km/h - 730km



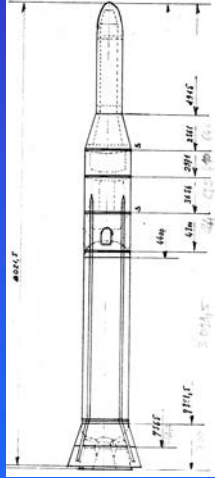
26.9.68 Eridan (2.338 kg - M9 - 470 km)  
 368+ L  
 21 bases?, 12 pays



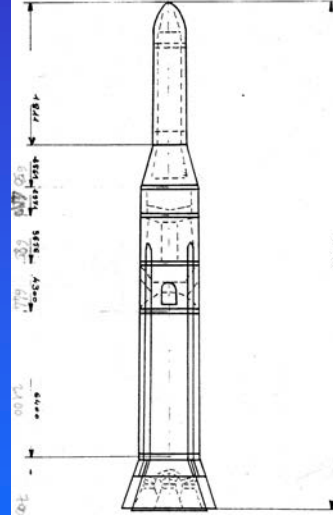
fin 62 BAR  
 NA 802 Soleil  
 6,5 t - ~M8 - d = 500 km



19.12.62 VE 111C Andromède->Topaze  
NA 802  
v G1, G2  
6L



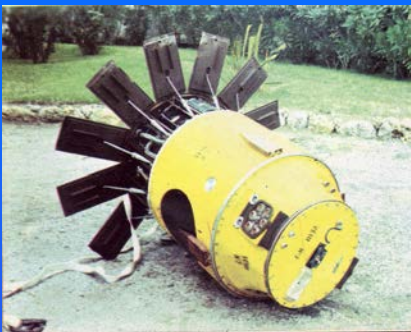
21.12.63 VE 111L  
NA 803  
2L



4.6.64 VE 111Ci  
4L



18.5.65 VE 111LG  
v L2  
3,7 t - M3,2? - h = 130 km  
1<sup>er</sup> guid inertiel Fr (SAGEM E22B)  
2L

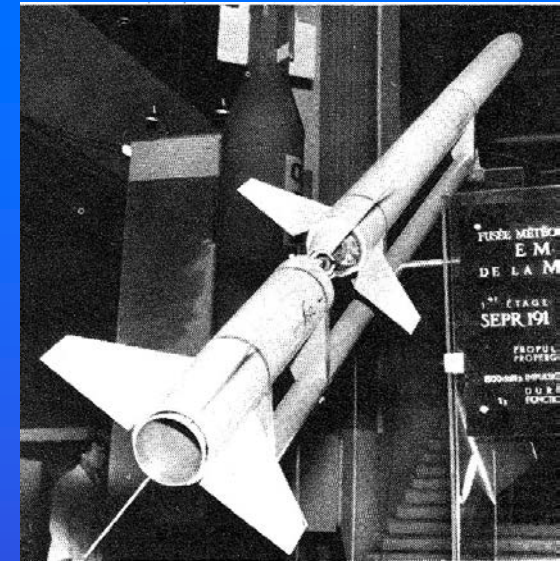


VE 111C-7

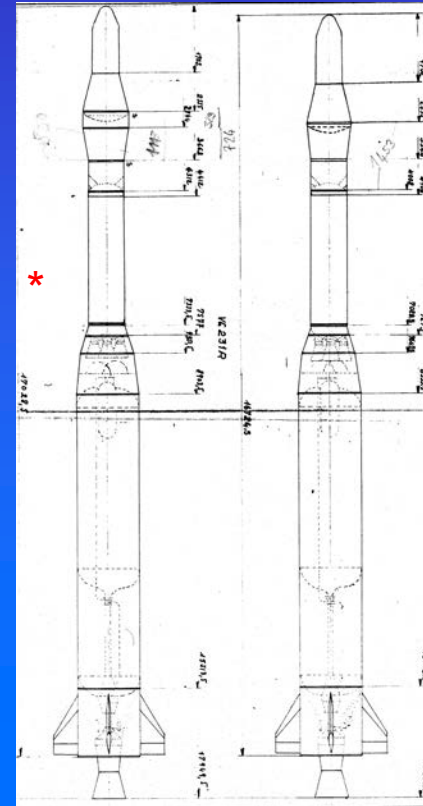
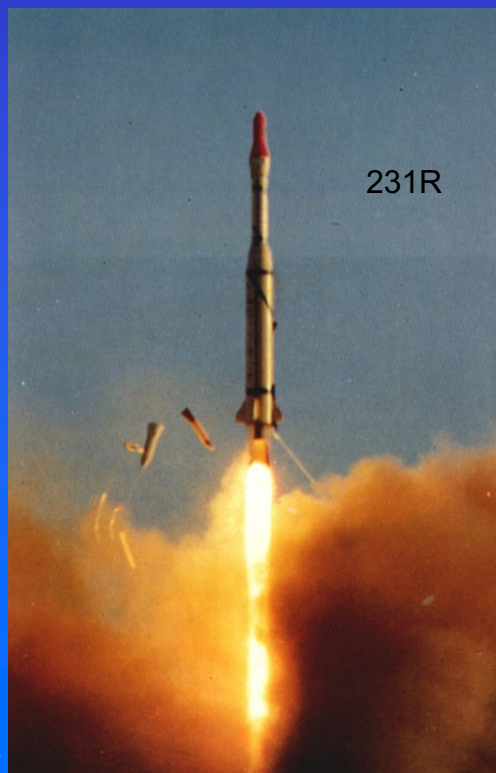


27.6.62 ONERA Bérénice  
3,5 t - M12 - h = 270 km  
12L

7.12.62 Sud MD-01  
h = 50 km  
4L



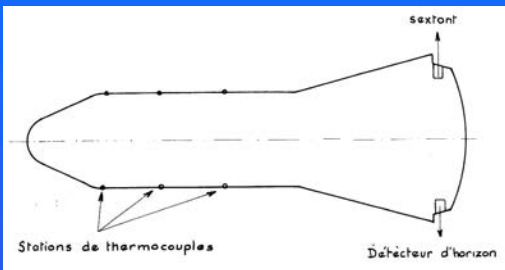
19.2.63 MATRA Emma  
70 kg - h = 70 km  
8L?



13.3.66  
VE 231G\*  
v L  
7F, 6L

17.6.64 VE 121 Cassiopée->Emeraude  
LRBA Vexin 27 kdaN  
HNO3+ess thér  
v K  
18,2 t - 1.660 m/s - h = 200km  
7F, 5L, 3 échecs

5.7.65 VE 231 Céphée->Saphir P  
v N  
18,1 t - M15 - d = 2.450 km  
4F, 3L, 1 échec



29.3.66 VE 231R (ogive R Thesa)  
v M  
2.740 km  
6L, 1 échec

25.4.64 LEX  
77 kg - h = 100 km  
8L

30.1.26



1.7.64 SNECMA Aurore  
50 kg  
7L

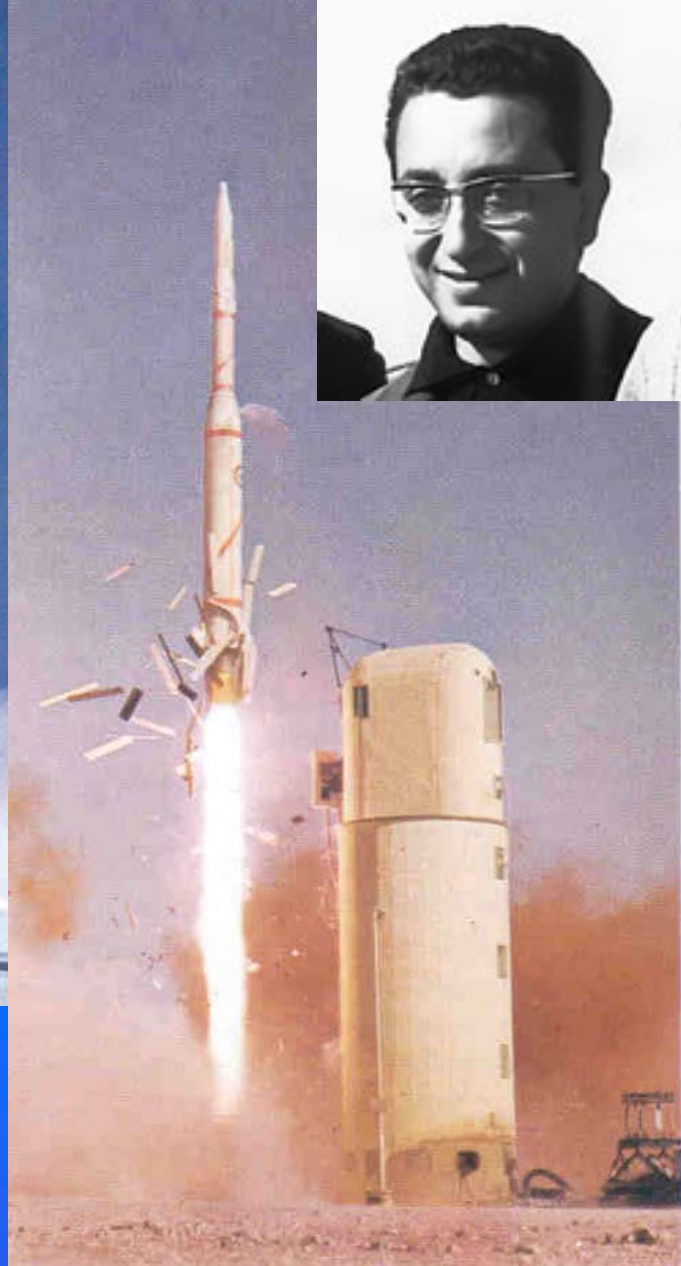
3Q64 MATRA/HSD  
AS 37/R.630/AJ.168 Martel  
TV/a-radar/Poussières  
300F?, 3 pays

IFHE 60 ans 1ers sat français



10.6.64 VE 210 Rubis  
Agate + P0,6  
3.380 kg - 18.500 km/h  
10L

22.4.66 h = 2.035 km RdE!



26.11.65 Diamant n°1  
17,97 t - 8,1 km/s (29.200 km/h)  
34,2°/528/1.752 km  
Fr 3<sup>è</sup> puiss spat 1<sup>er</sup> essai!



Charley Attali

9.64 VE 112T  
dia 1.500 mm  
4L



MATRA A 1  
42 kg

VE xyz:

x = nombre étages

y = 1 solide - 2 liquide - 3 sol & liqu

Z = 0 non piloté - 1 piloté - 2 pil & guidé

23.10.65 S 112  
P10/901  
25,1 t  
7L, 4 échecs



26.5.66 M 112  
P10/901  
17,4 t  
9L, 2 échecs



23.12.65 MD 620 Jericho  
Monobloc NA 804 Naël  
5F, 4L  
Bidasse +NA 805 Naël 2  
6,7 t - M8 - d = 500 km  
20F, 12L (total 6 échecs)

15.6.65 ONERA Tacite  
1,9 t - h = 200 km  
4L

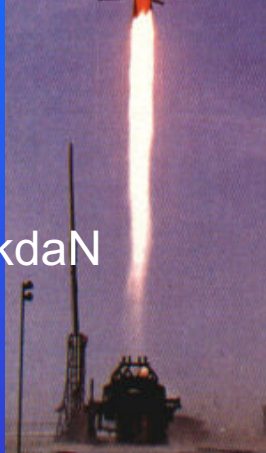


7.3.67 Martine



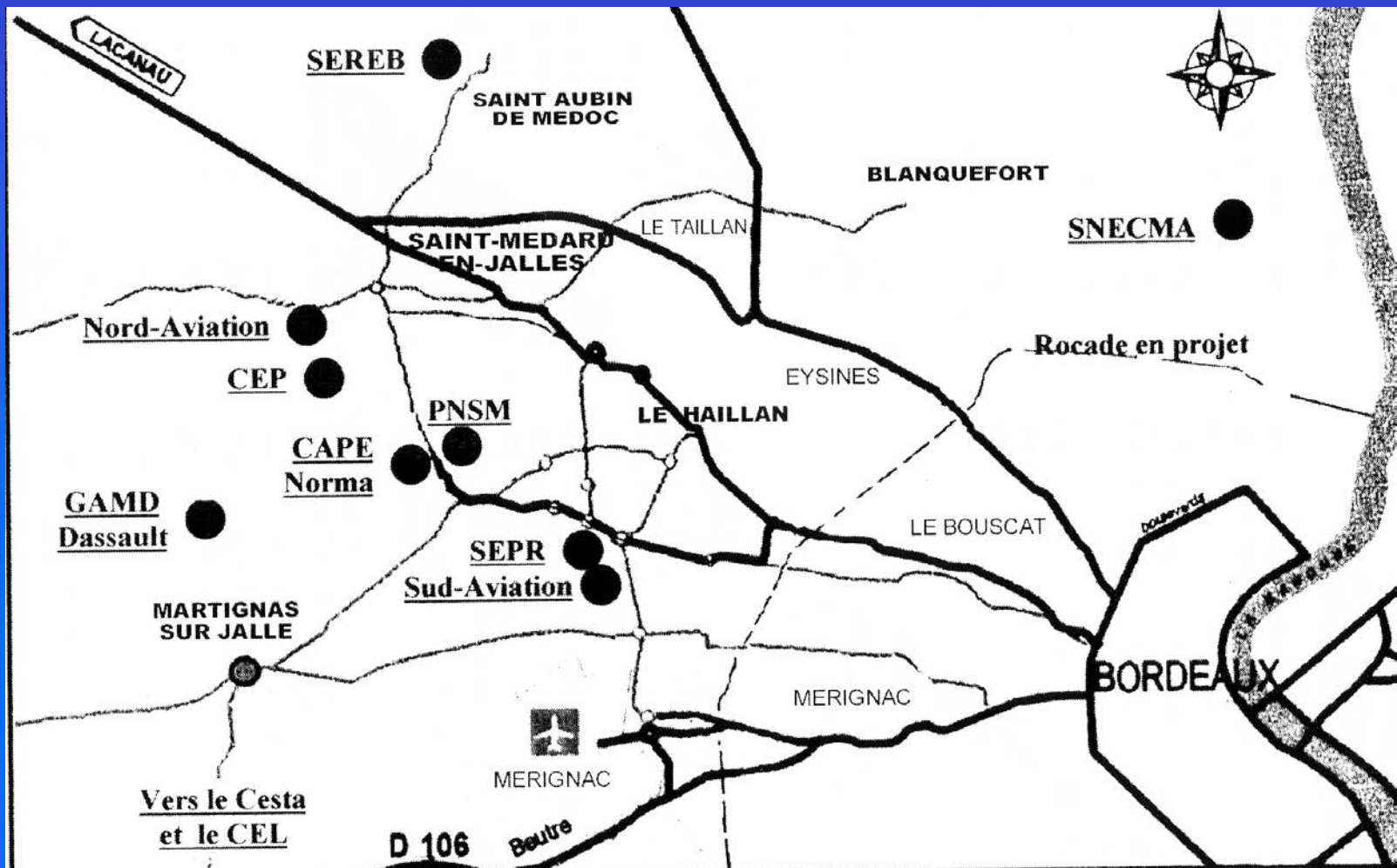
6.65 MATRA/CFTH R.440 Crotale/Cactus  
75 kg - d = 8 km  
6.400F - 15 pays

15.10.65 LRBA Vesta  
HNO3-ess.théréb 14,4kdaN  
5.435 kg - h = 365 km  
6F, 5L



10.11.66 ONERA Titus  
3,5 t - h = 270 km  
2L

# BORDEAUX NOUVEAU POLE SPATIAL



13.8.62 CAPE

9.10.62 SEREB Villepreux

5.12.62 SA Le Haillan

2.63 SEPR Le Haillan

2.12.63 SNECMA BDX->Blanquefort

18.12.63 NA St Médard-Issac

1964 GAMD Martignas

1961/75 AS Châtillon balistique & spatial ----> Les Mureaux

14.4.64 choix Guyane

1.7.67 CIEES ferme