ALISSA

J. Pelon

(Service d'Aeronomie du CNRS)

ALISSA

A French - Russian cooperation in the PRIRODA mission

by M.L. Chanin, M. Desbois,*
A. Hauchecorne, B. Mège,
*G.F. Tulinov**, V. Melnikov*** and*
*M. Ivanov***

Service d'Aéronomie du CNRS
- BP 3, 91371 Verrières le Buisson CEDEX - France
* LMD - Ecole Polytechnique - RD 36, 91128 Palaiseau CEDEX - France
** Federov Institute of Applied Geophysics, Moscow - Russian
*** N P O Energia, Moscow - Russian

SCIENTIFIC OBJECTIVES OF "ALISSA"

When used simultaneously with IR radiometer

- Validation of algorithms used to identify the clouds :

    altitude of the top part
    emissivity of different types of clouds
    occurence of different types of clouds

- Relationship between the cloud optical properties and meteorological synoptic conditions

- Role of cirrus in the radiative budget

- Determination of the planetary boundary layer height

- Determination of aerosols vertical profiles (saharian dust, volcanic eruptions...)

- Role of aerosols in the remote sensing of the thermal structure and on sea-surface temperature determination

- Validation of the remote sensing of the cloud cover and T of sea surface from GOMS and METEOSAT

- Evaluation of the interest of coordinate use of lidar and radiometry for future programmes

TECHNOLOGICAL OBJECTIVES

Scientific objective n° 1 : evaluation of future lidar systems

The experiment will allow to evaluate the sizing of future lidar instruments aimed to operational uses.

Scientific objective n° 2 : problems of sampling in future lidar systems

Cross sections obtained by ALISSA across various cloud systems will allow to evaluate on realistic grounds the useful proportion of shots in future systems like wind lidars, dial lidars for water vapour measurement,... which are perturbated by clouds.

ALISSA

Main characteristics

Laser : 2 nd harmonic of Nd-Yag 532 nm

E = 40 mJ)

(→ <u>2 W</u>

rep. rate : 50 Hz)

Receiver : Ø = 40 cm

field of view : 10^{-3} rad)

(night time only

band pass : $\Delta\lambda = 0.5$ nm)

Spatial resolutions

$\Delta_z = 150$ m (1 µs)

$\Delta_{z,y} = 1$ km (6 pulses)

Expected echos from different types of scatterers :

cumulus :	>	100 photons
sub visible clouds :	~	10 photons
tropospheric aerosols :	~	10 photons
stratospheric aerosols :	~	1 photon

Necessity for cirrus and aerosols of degrading the resolution.

	ALISSA	LITE
λ	532 nm	532/355/1.064 nm
E	40 mJ 50 Hz	400 mJ 10 Hz
Telescope d.	40 cm	90 cm
Field of view	1.10^{-3} rad	$1.5\ 10^{-3}$ rad
Δz	150 m	20 m

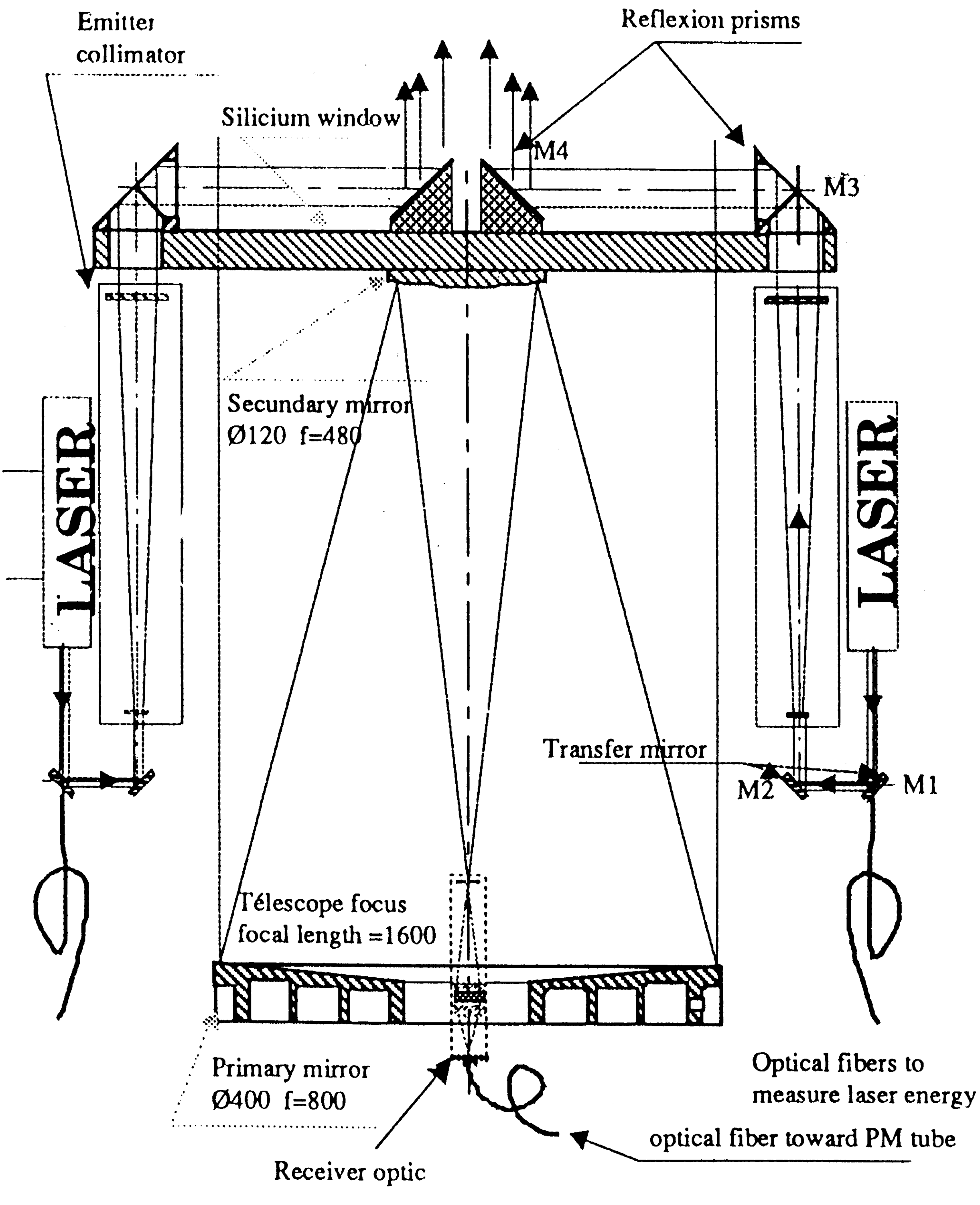
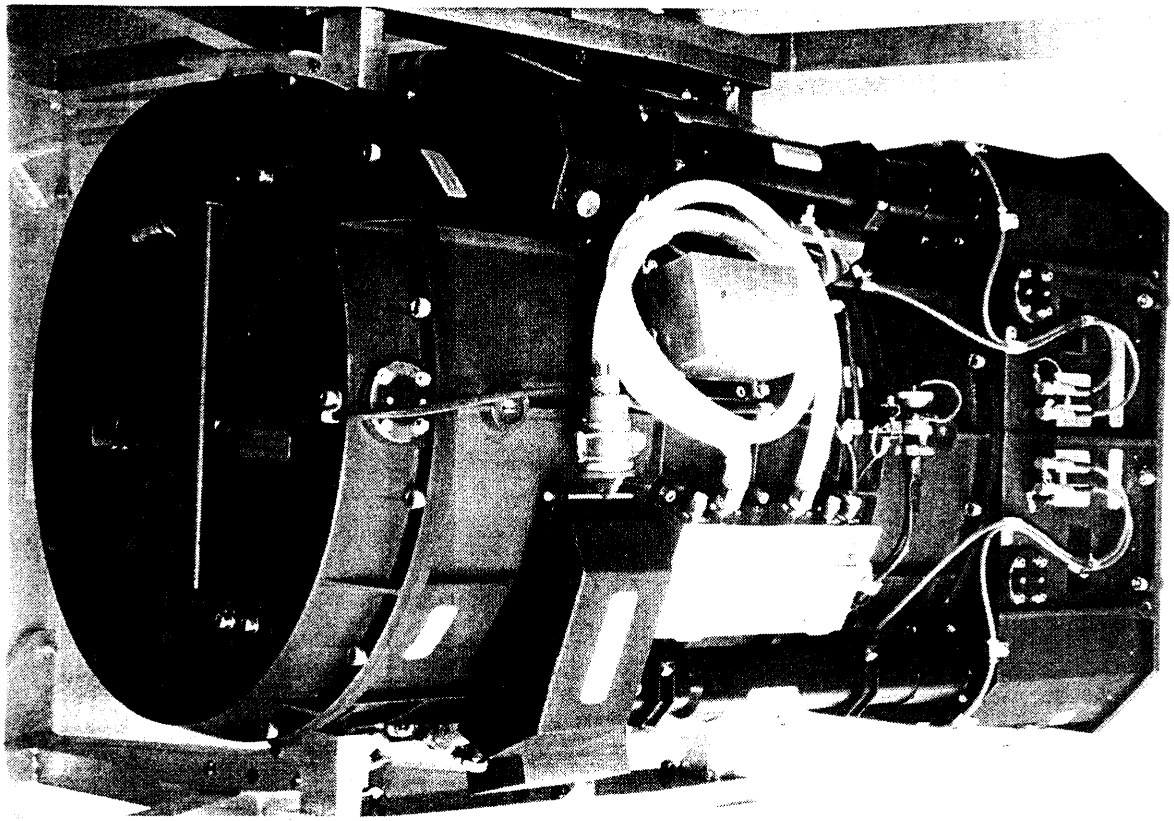
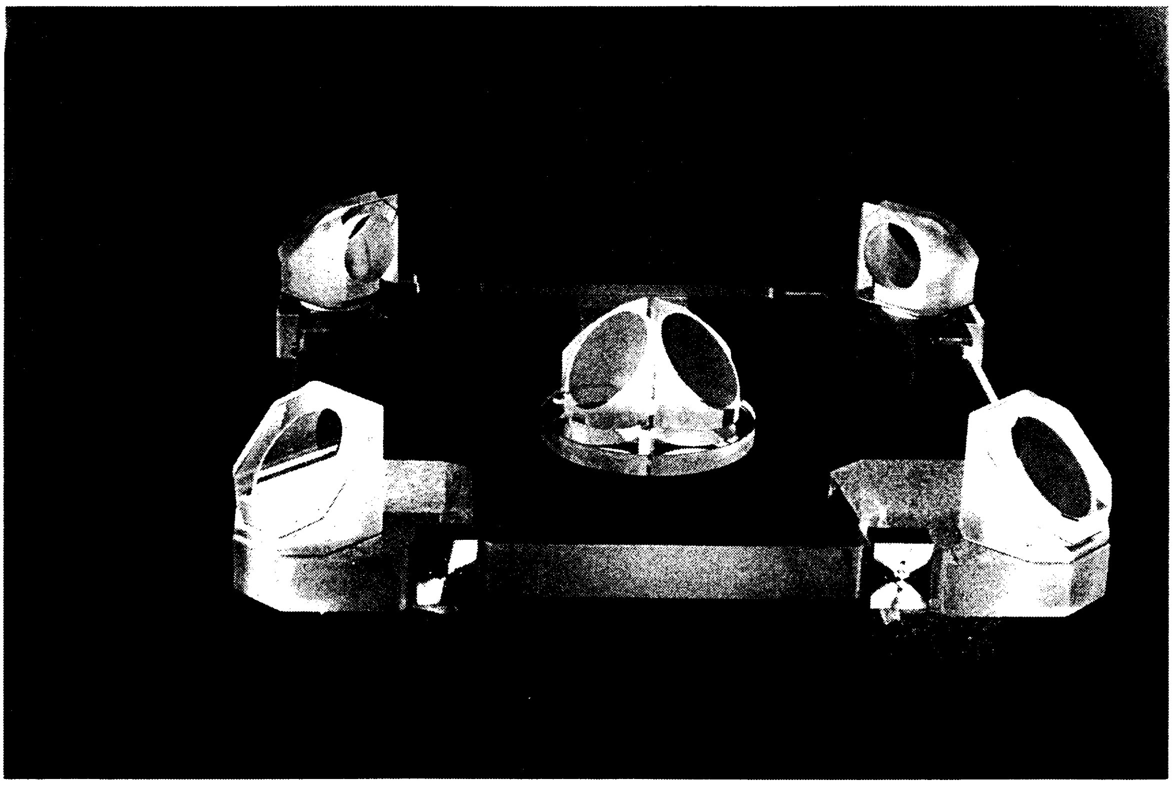
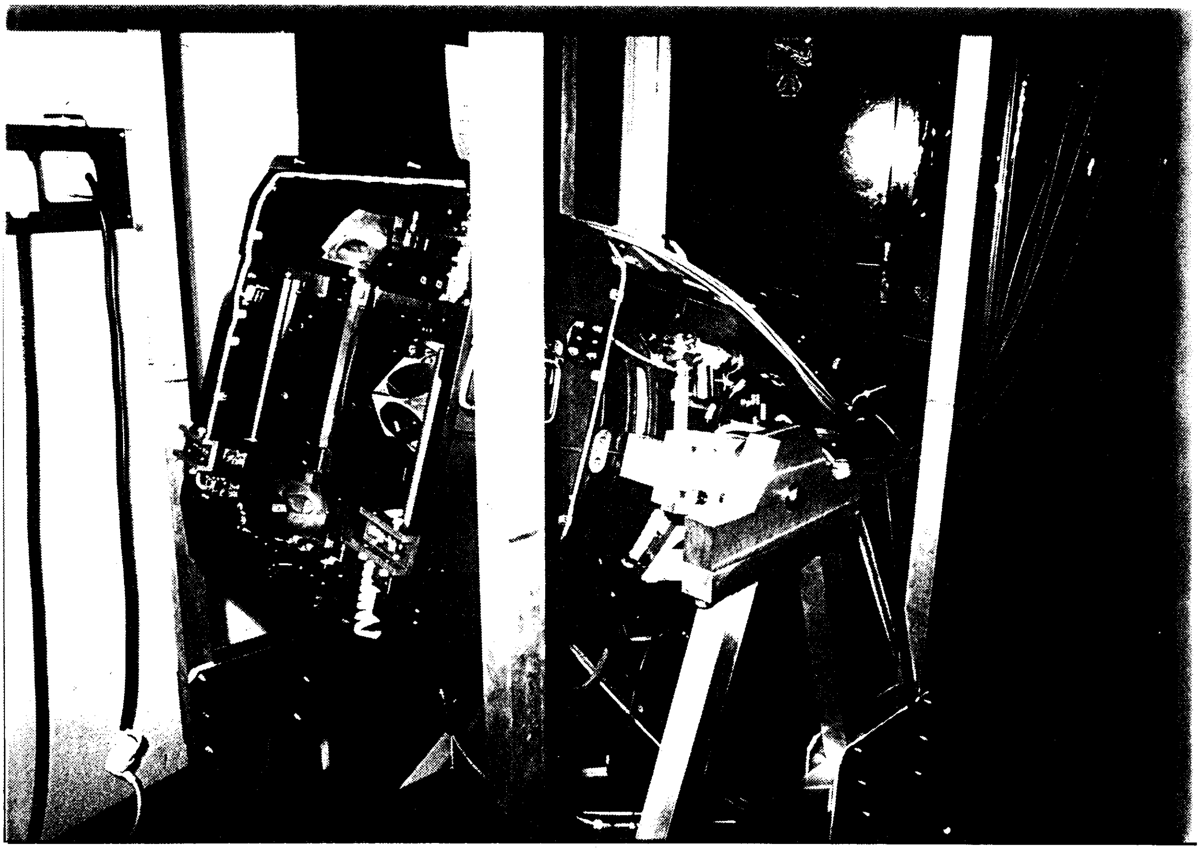
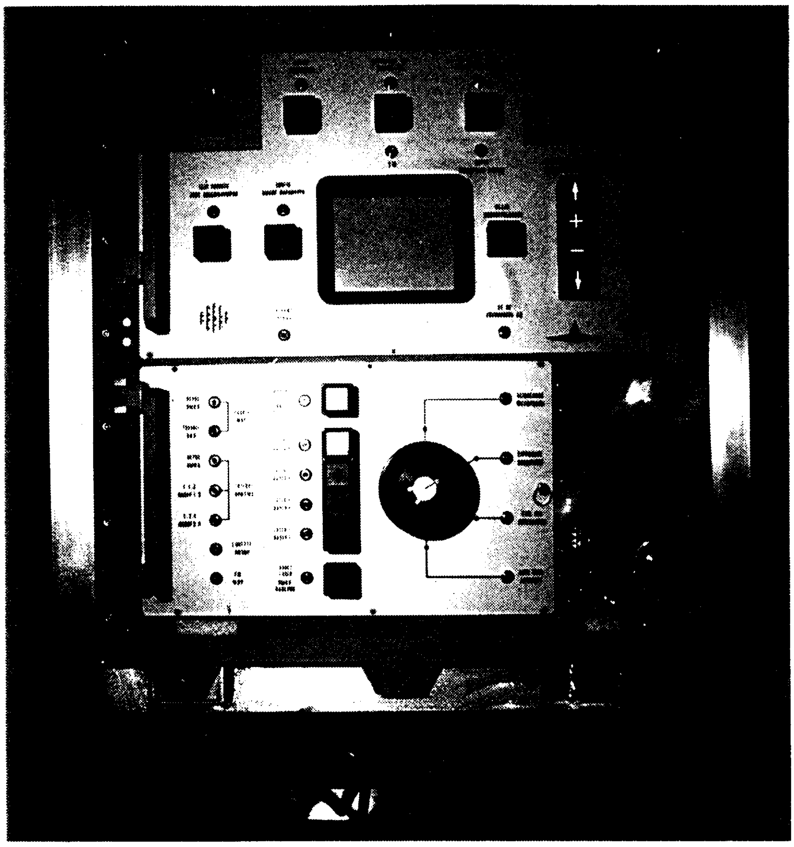


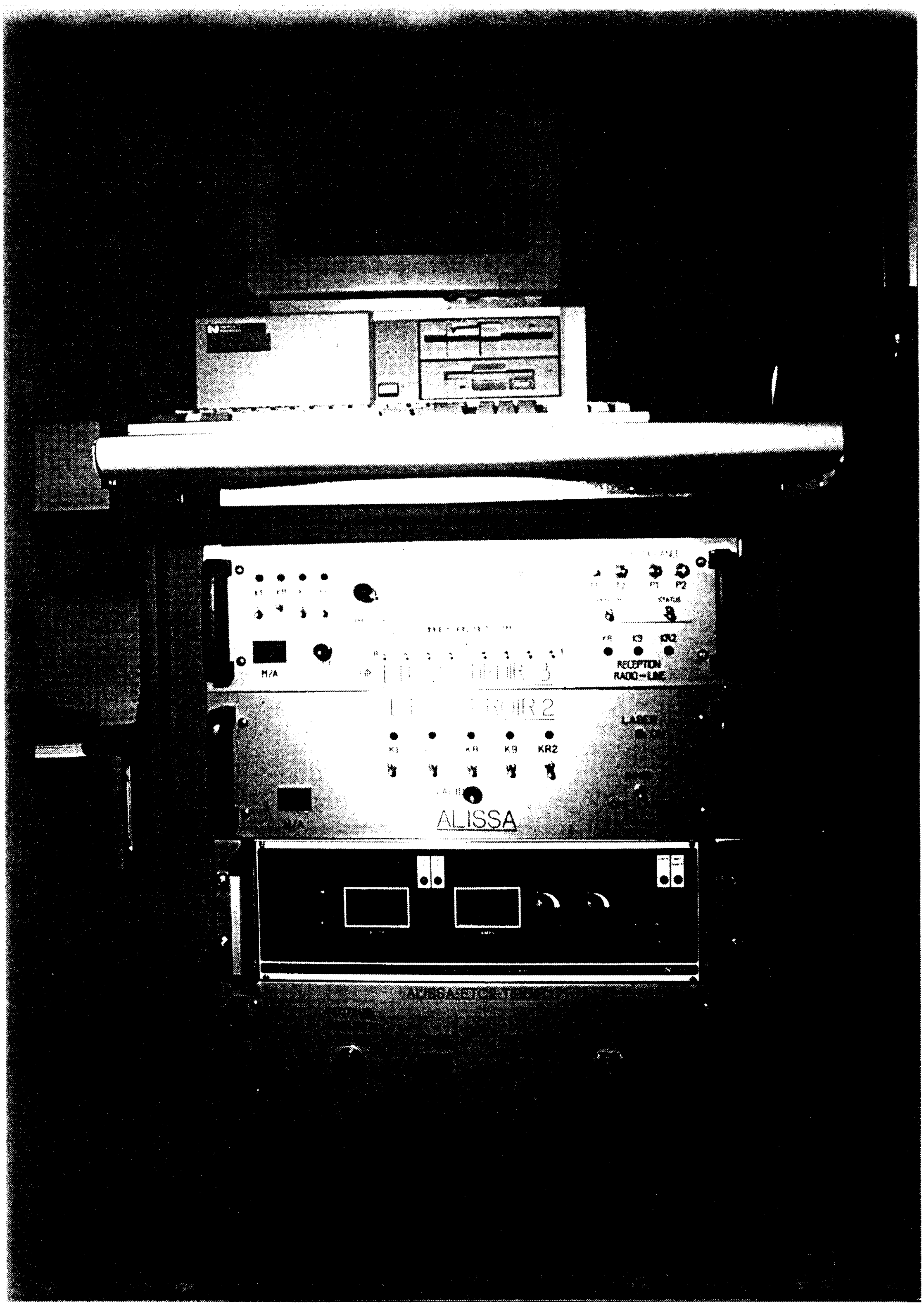
Figure 1: SCHEME OF THE OPTICAL DESIGN

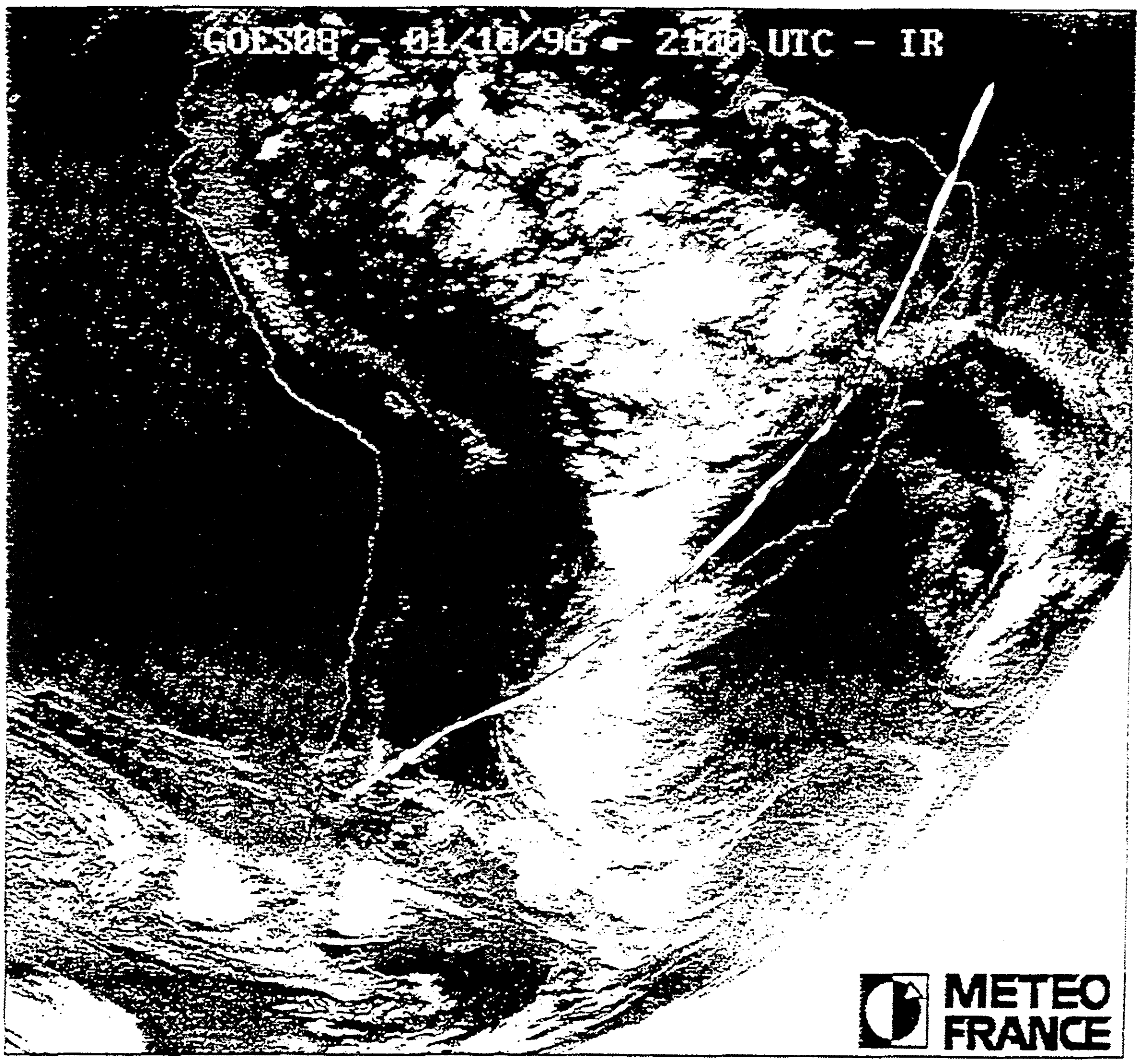









P1 P2
STATUS
K8 K9 KR2
M/A
ALISSA


GOES08 - 01/10/96 - 2100 UTC - IR
METEO FRANCE