The television camera was primarily positioned looking out at 60° to the horizon, but on two flights it was situated at a 15° window. The camera had a 30° field of view. The long wavelength cut-off at the television tube was ~ 900 nm, with peak response at ~600 nm. A Wratten filter with short wavelength cut-off at 670 nm was placed in front of the camera lens. Peterson and Kieffaber[2] made observations of airglow clouds

Fig. 1 Airglow clouds looking east from an altitude of 39,000 feet on June 18 at 0930 UT (0122 LT), latitude 45°, longitude 122°W. The picture was obtained by integrating over seven television fields, that is, for 0.28 s.

at a 15° window on the same side of the aircraft throughout the mission.

We found that well defined cloud-like structures could be observed easily with the camera only from the low elevation (15°) window (see Fig. 1). The atmosphere was not sunlit below about 400 km at this position, thus excluding the possibility that these structures are noctilucent clouds.

Assuming that the aircraft speed (~ 250 m s^{-1}) is likely to be much greater than upper atmospheric wind speeds at middle latitudes, we can estimate the altitude (80–85 km) and horizontal dimension (~ 20 km) of individual bright patches of airglow.

Airglow viewed through the 60° window was diffuse, and small scale structure was not easy to identify. There were, however, variations in intensity over the television field of view, particularly when well defined structures were visible at lower elevations through the image intensifiers of the cameras of the New Mexico group. Identification of individual clouds was complicated by the aircraft roll during the longer integration times (1 or 2 s) needed at the high elevation window because of lower airglow intensities. These lower intensities indicate that the thicknesses of the airglow structures are small compared with horizontal dimensions. The general airglow brightness, seen from the 60° window, varied from day to day and from place to place; we are making a separate study of these variations from the television records.

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Far infrared observations of dark cold clouds and H II regions

WE present here a brief description and preliminary results of our airborne far infrared experiment (see ref. 1). At the focus of a 30-cm open-port Cassegrain telescope was a Low-type germanium bolometer, NEP of 3×10^{-14} W Hz$^{-1/2}$, following a four-filter set of bandwidths, respectively, 31–38 µm, 47–67 µm, 72–94 µm and 114–196 µm. Cold diaphragms from 1.57′ to 6.3′ were actually used[2]. The secondary mirror was wobbling at 37 Hz, with a typical beam throw of 9′, and scanning in both x and y was possible up to 30′×30′. The stability of the system was better than 1′ and was as low as 15″ during steady parts of the flights. Tracking was done by means of the star video signal (from a Nocticon tube), which was electronically processed and looped on the torque motors of the gyro-stabilisation. A PDP-11 computer was used for on-line visualisation of digitised maps.

Calibration was carried out seven times on Venus, but unfortunately not for all the flights reported on here. Significant and variable 'sky noise' (of up to 20 times the detector noise) meant that only some of the data is really usable; we therefore made systematic measurements on this 'sky noise' (to be published).

Table 1 Flux intensity in 10^{-23} W m^{-2} Hz^{-1}

Source	114–196 µm	72–94 µm	46–67 µm
W51	4.4±0.5	16±2	42±4
M17	28±8	–	–
ρ Oph	14±4	–	–
S131	22±6	–	–

The aim of the experiment was the detection and mapping at several wavelengths of dark galactic clouds. Four sources were studied: ρ Ophiuchus, S131, W51 and M17. At this early stage of the data examination, only the last two seem to show extension and structure. Table 1 summarises the fluxes computed for these four objects assuming, for Venus, a black-body temperature[3] of 220 K, and a size of 19′. We can derive for W51 an equivalent black-body temperature significantly higher than that proposed by Harvey[4], at least 100 K. As for M17, our values agree well with those of Hoffmann[5], assuming that the source is extended and uniformly bright. Our studies of ρ Oph and S131 confirm the high degree of correlation between CO clouds and dark regions[6,7].

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