

PLANS FOR TOVS IN PORTUGAL

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1. System Configuration and Current Capabilities

The National Institute of Meteorology and Geophysics, in Lisbon, is the government agency responsible for all operational and research activities in the fields of atmospheric sciences and physics of the solid Earth. The Meteorological Service is one of the main branches of this Institute.

The satellite receiving groundstation of the National Institute of Meteorology and Geophysics has been gradually expanded since 1978, and has capabilities to receive digital data from Meteosat, GOES and NOAA's satellites.

Original plans were revised by 1981, when it was decided to modify a stand-alone configuration for hardcopy images, and start with the implementation of an interactive system and data processing capabilities.

The present configuration (Figs. 1 and 2) must be intended as an intermediate stage, and its goal was to provide the Weather Forecasting Division of the Meteorological Service with the main operational means for manipulation and interpretation of images 24 hours a day. Priority has been given to the Meteosat data, and the basic software for Meteosat images was implemented in 1984.

The current capability for polar orbit satellites enables to receive HRPT transmissions:

- programmable tracking antenna (Scientific Atlanta)
- preamplifier, receiver and demodulator (Scientific Atlanta)
- bit synchronizer (EMR 720)
- frame synchronizer (EMR 814)
- image microprocessor (EMR 813)

The frame synchronizer is interfaced with a PDP 11/34 minicomputer, with 256 kB and a RSX-11M operating system. The acquisition software is the Televent package from EMR. Due to the priority given to the Meteosat PDUS, only a little investment was made to decode and process the AVHRR signal from polar orbiters.

The AVHRR images can be manipulated now in a Vision 1/20 interactive system from COMTAL, interfaced with the PDP 11/34, through a ZB driver, with four image and two graphic planes. Images can be sectorized, zoomed, combined, enhanced and analyzed with several algorithms. Data navigation and calibration cannot be applied as the actual frame synchronizer and acquisition software do not decode the necessary information.

The Weather Forecasting Division uses the AVHRR to monitor the activity and evolution of small scale perturbations, not identified by the large scale numerical model of the ECMWF: structure of frontal systems, early stages of cyclogenesis, convective areas and fog. The location of pixels is made with an algorithm based on the navigation data available in TBUS messages. Calibrated enhancements of the sea surface in coastal areas have been experimented, in cooperation with the Oceanographic Institute.

2. Future Plans for TOVS

The acquisition and use of TIP data is in our plans for the next three to five years:

a) Motivation

Portuguese meteorology is interested in the use of TOVS data, especially for the following reasons:

- retrieval of sea surface temperatures in coastal zones;
- improvement of hydrological and heat balances;
- support the implementation of mesoscale models;
- organize a regional cloud climatology data set;
- improvement of ozone observations.

b) Next Steps

- Some modifications in the hardware and acquisition software will be made to receive AVHRR ancillary information and TIP data.
- The interactive system will be expanded and complemented with other terminal, and interfaced with the computer center of the Institute.
- Implementation of software to handle the AVHRR as well as the implementation of the International TOVS Processing Package are expected to be made, after a plan of cooperation with the Cooperative Institute of Meteorological Satellite Studies be defined.

c) Scenario for Data Processing

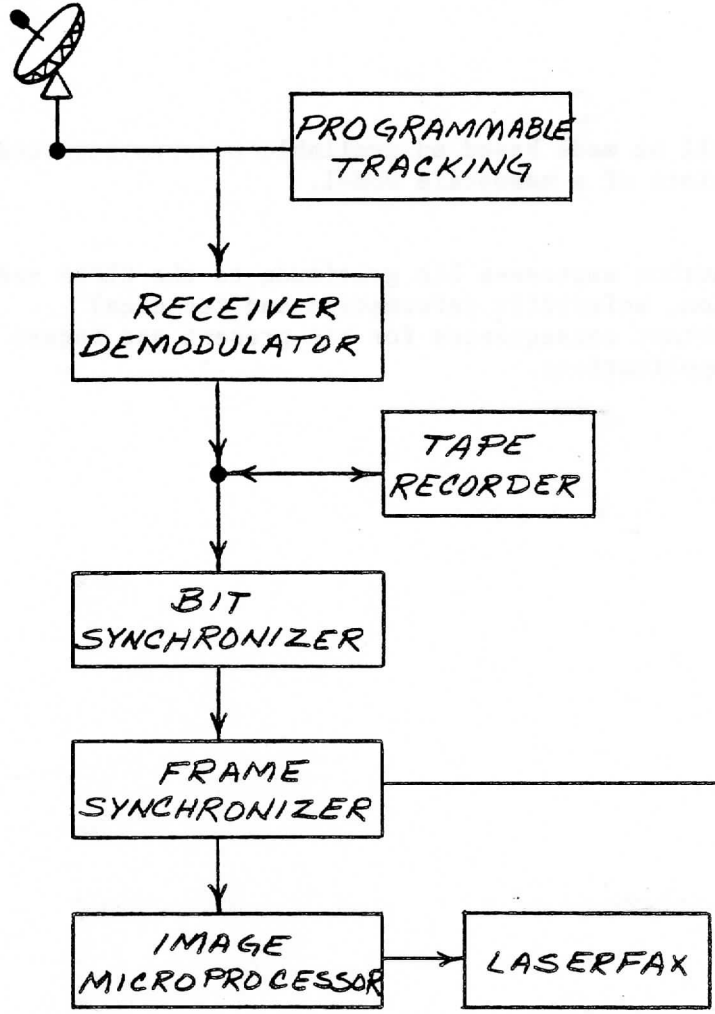
- TOVS will be processed for operational and research purposes: operational routines will be run in the computer center, and research work will be based on minicomputers.
- Data will be used to analyze the mesoscale structure of the weather patterns, adjusting the long wave structures with the outputs from the ECMWF.
- Retrieving areas will be selected by interactive control (AVHRR), and optimum interpolation methods will be used to correct cloud effects.

- 3D adjustments will be made based on available observations and dynamical constraints of a mesoscale model.

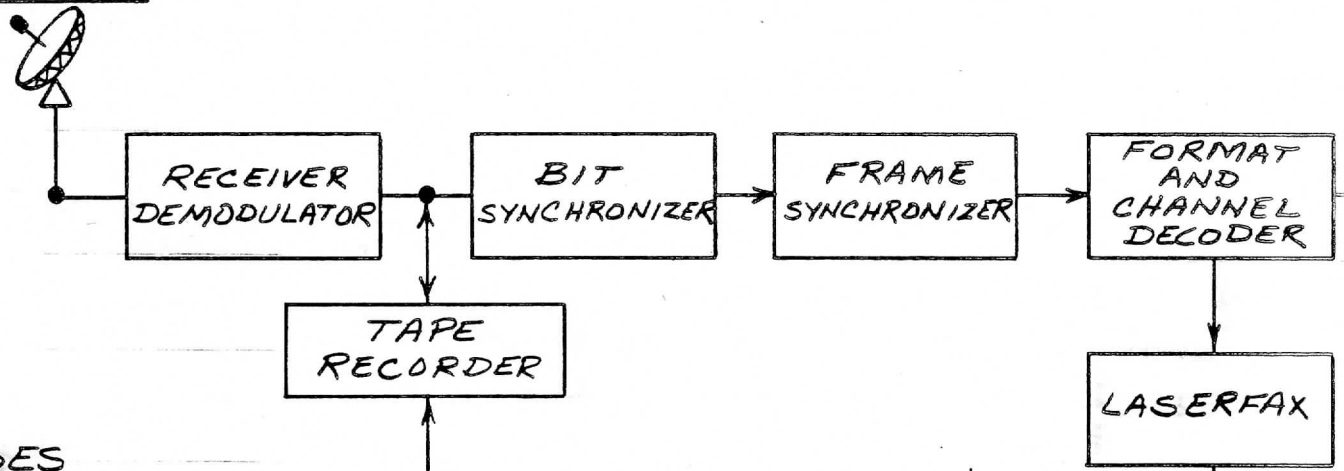
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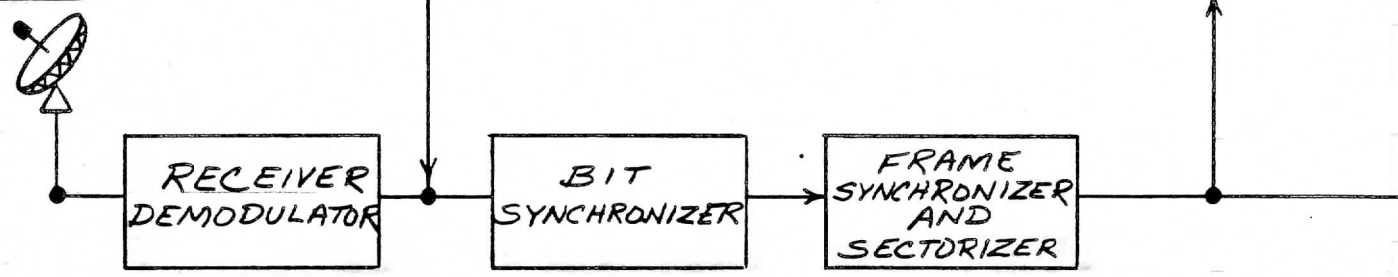
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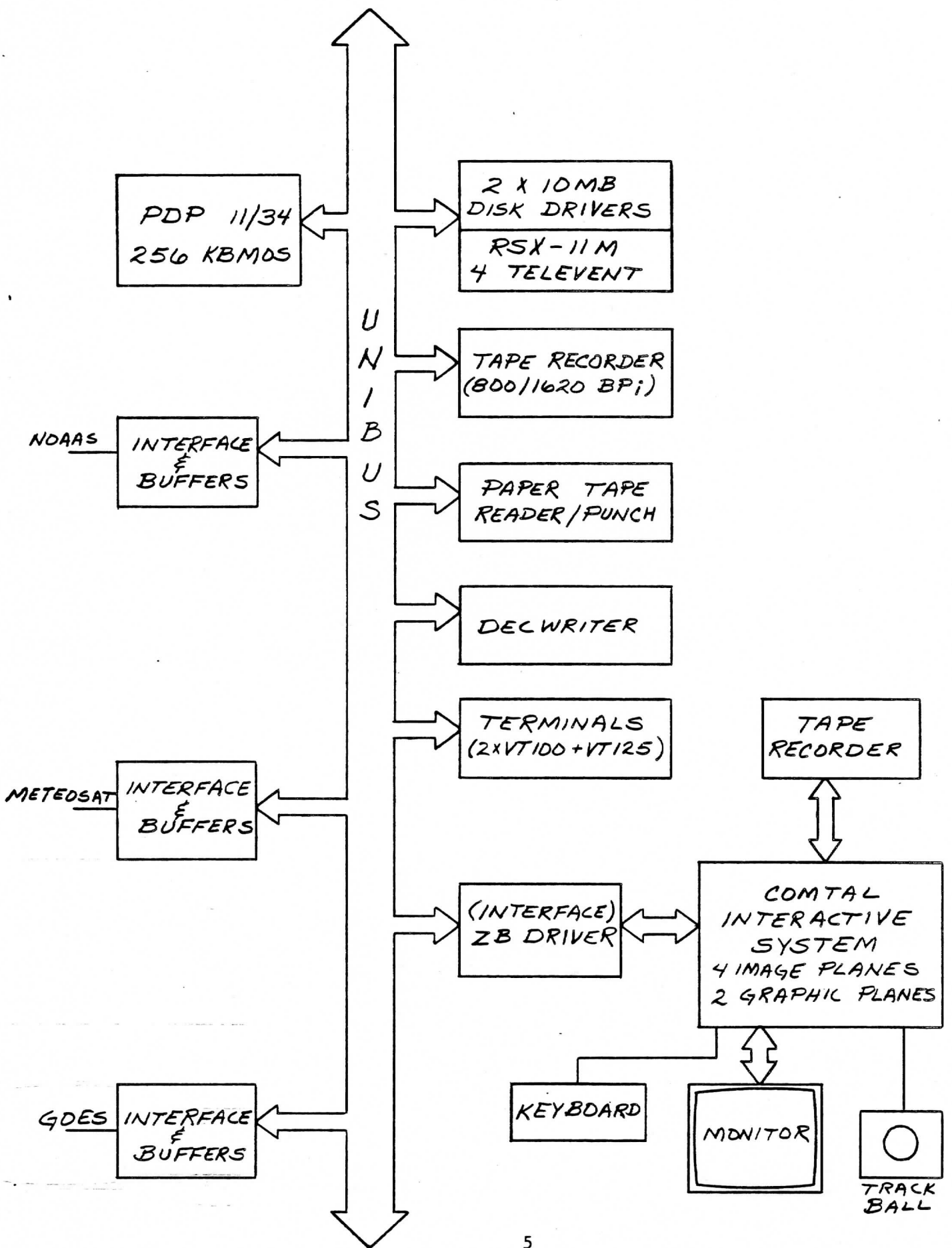


METEOSAT



GOES





The Technical Proceedings of
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