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Study on Optimum Meteorological Information System of Korea

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Abstracts

This study has been intended to design an optimum meteorological information system appropriate for Korea as a part of 5 year development plan. The 5 year plan was that to set up new direction in order to modernize meteorological data acquisition, processing and information distribution.

The detailed research has been led to presentation of optimum meteorological information system of Korea eventually, selecting the computerization of communication as the primary object of modernization.

In the study, research concerning effective equipment configuration, data communications internal as well as external, and the related implemenatations has been carried out with the approach of system component consideration under system application design.

As the results of the study, integrated network of meterorological data communication was presented including earth quakes, radar, aerologic, marine weather observations and so on.

I. Introduction

Meteorological information system can be defined as the composite system of acquisition, analysis and dissemination of all data refered to meteorological phenomena. Four elements-speed,

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communication, accuracy and cost have been considered in the study.

The first phase of study focused on understanding the circumstances of Korean Meteorological Information System and reviewing that of developed nations. The 5 year plan was set up in order to present new direction to modernize Korean Meteorological Information System, and the computerization of communication was selected as the primary object of modernization.

In order that the basic system presented in the first phase could be carried out the second phase of study conducted various detailed research according to priorities. Furthermore, review of the earlier study was made with necessary modifications in later research.

II. Status of internal and external meteorological data communication

Important functions of CMO in meteorological data communication are acquisition of domestic weather observation data from local meteorological office, letting LMO exchange data from each other, sending an analyzed data to RMC (Regional Meteorological Center, Tokyo Japan) by Land Line Teletype so that it could distribute to the world though GTS (Global Telecommunication System).

CMO also acquisites various meteorological data from foreign countries by LTT, RTT and let Kimpo communication office broadcasts coverage infromation by RTT to AFTN.

Fig. 1. shows present status of Korean meteorological data communication network as a NMC in W.M.O.

Fig. 2. shows new internal data communication network computerized for data acquisition, analysis (forecasting) and dissemination in CMO.

Description of each component is just the performance level of function, not meaning any specification. This system includes flexibility and can be transferred downward.

III. Components of the system

In this study, research concerning effective equipment configuration for data communications and the related implementations has been carried out with system component design under the guidance of system application.

The study on each component of sub-system are as follows:

1. Meteorologic application software
   a. satellite data processing

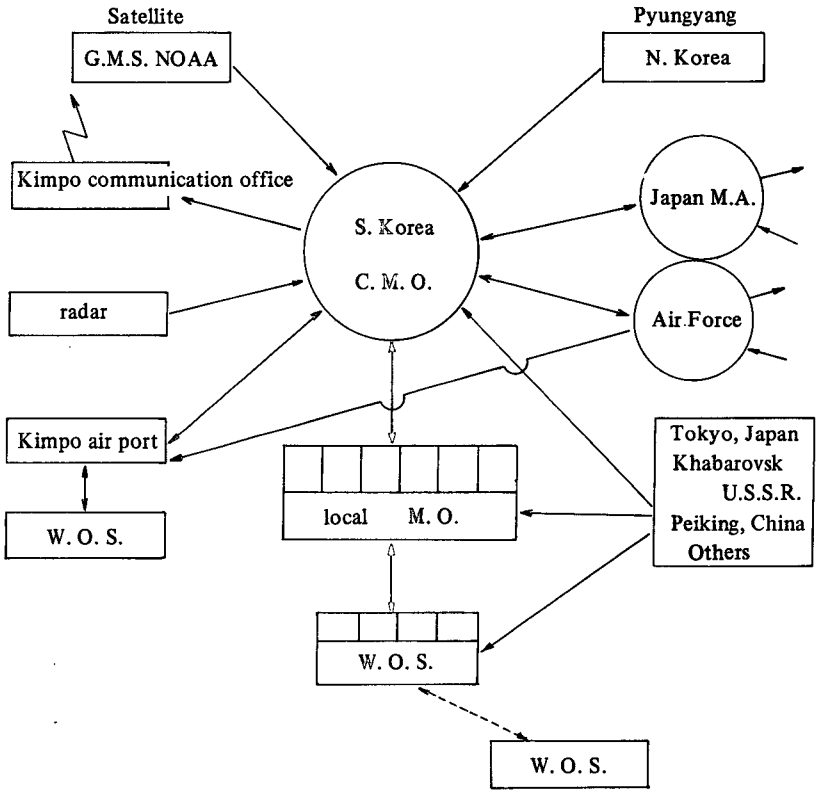

Fig. 1. Schematic diagram of Korean meteorological data communication

b. real-time meteorologic mapping

2. Design of automatic weather station

a. hardware

b. software

3. Numerical weather forecasting

a. quasi-geostrophic modeling

b. primitive modeling

4. Distribution and service of meteorologic information product

a. status of service of meteorologic information product

b. request for product

c. method of distribution

5. Integrated network of meteorologic data communication

a. data communication of TANDEM TXP

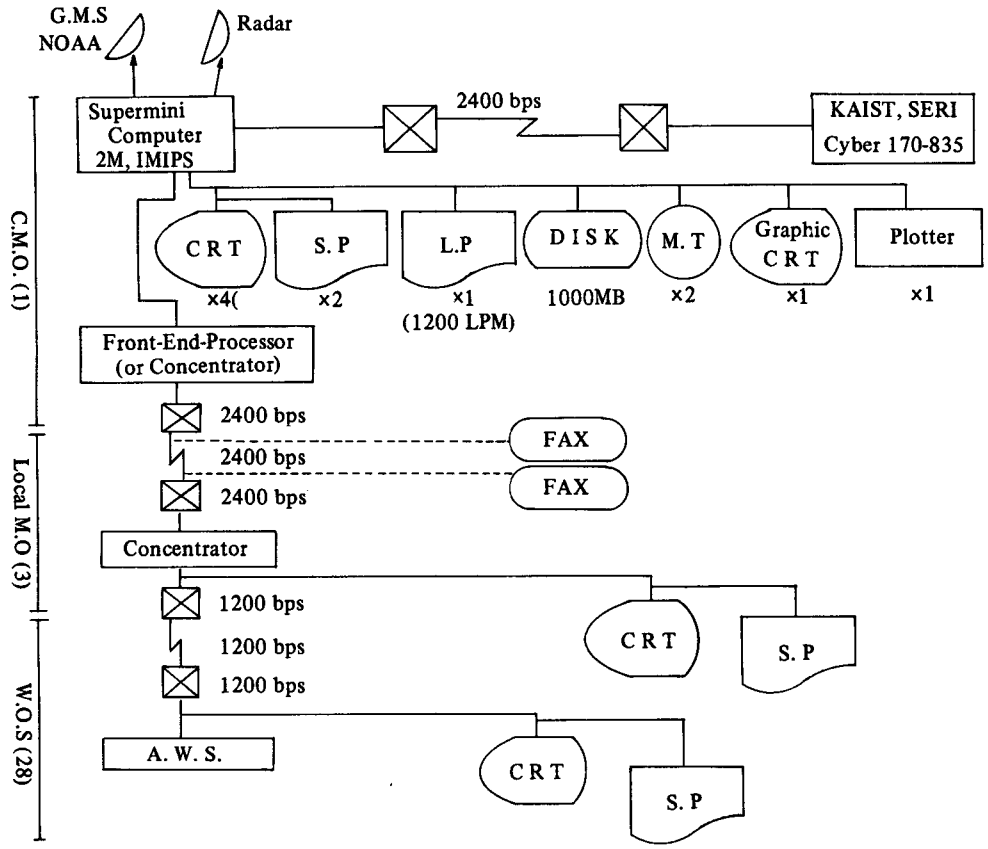

Fig. 2. Configuration of computer system

b. interface to system of other organization

IV. Results and recommendation

a. Preparation for receiving stretched VISSR data from GMS satellite should be initiated immediately.

b. Integrated network of meteorologic data communication including earthquakes, radar, aerologic, marine weather observation and so on was presented.

c. Improvement for network and equipment for marine weather observation domestic as well as overseas is desired.

d. Network of aerologic weather observation is suggested to be integrated with existing

aerologic observation station of air-force and military.

e. Seismic observation is desired to establish central network of autoseismic observation.

f. Design of auto weather station is performed in order to promote homeproduction.

g. Software development for operation and application of communication computer, and the method that computer in CMO connecting to national research network (host computer in SERI, KAIST) was studied.

h. System of review on equipment purchasing and modernization of meteorologic manpower is suggested for CMO in order to convert to the organization operating NWP.

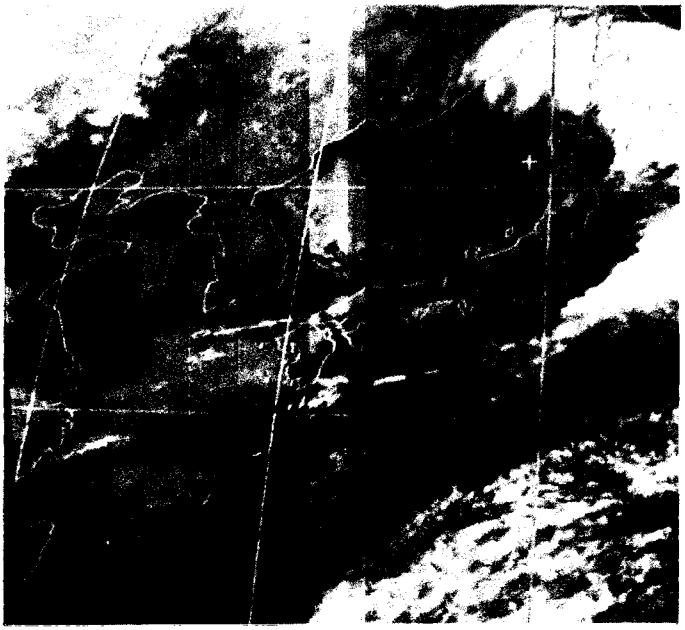

Fig. 3. Cloud Coverage Map at 12:00 Jan. 28th, '85 Received from G.M.S. by Central Meteorological Office, processed by Cyber 170 and displayed by color CRT of TEKTRONIX in SERI, KAIST.

References

1) Kim, J-W, 1982, "The atmospheric moisture balance simulated for January and July by the OSU two-level atmospheric general circulation model, Climatic Res. Inst. Rept. No. 40, Oregon State Univ.

2) Tandem Computers Incorp., 1983 "TANDEM hardware and architecture, Guardian Sys-

tem," Cupertino, California

3) Bureau of Meteorology, Australia, 1981 "Automated regional operating system, Victorian AROS Prototype Project, Project Development Plan.