探針式大氣溫度計之研究

Device of Probing Instrument for Atmospheric Temperature Measurement

亢玉瑾　　蔡木金　　吳清吉

國立台灣大學　　國立中央大學　　國立台灣大學

一、前言

鑑於國內較精密之新型氣象儀器，幾均購自國外，價格昂貴，購置費時，購買前多僅能由說明書略知其構造及性能，儀器到達後，如未盡理想，甚難要求改善，偶有故障，當須送原廠檢修，至少亦須函請寄送配件。費事、費時、費錢、影響資料獲得至鉅。

復鑑於國內近年電子及機械工業有長足進展，由此基礎，若有關人員能共同努力，當可自行研製氣象儀器，節省公帑，減低對外依存，爰進行本計劃，以為長程研製氣象儀器之張本。

二、製作原理

圖一為流程圖，可約分為溫度顯示，時間顯示，記錄器及

DEVICE OF PROBING INSTRUMENT FOR ATMOSPHERIC TEMPERATURE MEASUREMENT

Yu-Chin Kang Mu-King Tsay Ching-Chi Wu

Department of Atmospheric Sciences
National Taiwan University

Almost all the meteorological instruments used in our country are imported from outside. It is expensive in price and time consuming in procurement. In case of instrument troubles, parts and technicians usually could not be domestically obtained for repairment with the results of frequently impeding observations.

In view of the enhancement of the electronic techniques and relevent industries, we do think meteorological instruments could be designed & manufactured locally by ourselves. This investigation is the beginning of a series of such projects.

The sensor is probe type which is composed of a thermocouple and its horsing. As the temperature changes, the voltage of the thermocouple will change accordingly which is converted back to digital readings for atmospheric temperature measurement. We use temperature of 40°C, which is electrically kept in a constant temperature unit, as the reference point instead of the usual practice of 0°C, controlled by water-ice mixture.

The principle of this project is as follows. Air temperature sensed is translated into voltage. After amplification, the signal is divided into two branches, one leads to the polarity indicator to show the temperature is positive or negative, the other leads to A/D converted, counter, decorder/driver & temperature display to show the corresponding temperature by the absolute digital number of the counter. Every ten minutes, the BCD signals of counter imput to the decorder of the printer which prints and records the time and temperature.

All the parts except the Japanese NEC made printer head, are purchased locally. The cost of the instrument is much lower, and instrumentation knowledges have been learnt by the authors. We are now making further improvement of the recorder to be a multiple-element recorder.