



## 1. INTRODUCTION

### 1.1 General Description of Various Types of Recorder

Recorders are widely used nowadays in automatic control systems and production lines. According to the operation of the recording pen, they can be classified into three different groups. The first type operates by direct conversion of mechanical input to deflection of the recording pen, such as pressure recorder, flow rate recorder, etc. <sup>(1)</sup> The second type, mechanical input is converted into electrical signal by a converter. This signal is then used to operate the plotting device which is usually a galvanometer or a servo motor with an amplifier, or a light-spot galvanometer. The third group operates by combining the first two methods together such as the Ultrasonic Depth Recorder. <sup>(2)</sup>

Sometimes it is necessary to record simultaneously several parameters with respect to another variable. Consequently, multi-channel recorders with several recording pens, each one records individual input on a separate chart strip, are employed. Some disadvantages of this type of recorder are that the effective chart width is reduced by a factor of number of channels. Therefore, in order to improve the accuracy, wider chart is required at the expense of high cost of the chart. Difficulty arises in storage of various sizes of charts, and larger front space is required.

A recorder with a single pen and an automatic channel selector switch seems to be a satisfactory solution for the previous problem, but its application is limited by its discontinuous traces. Furthermore, the recorder must be equipped with a trace blanking device which must operate during transition period from one channel to another. It is essential that the recording

pen of this type of recorder must be critically damped, otherwise a delayed blanking circuit has to be employed to delay the blanking period until the recording pen has reached its final position.

## 1.2 Purpose of the Experiment

The purpose of this experiment is to introduce, into the field of recording instrument, another type of plotting device which operates by a high speed scanning (in the y-direction) stylus which transmits a marking pulse, to mark metal coated paper at the point corresponding to the amplitude of input voltage. One of the advantages of this type of recorder is its capability of recording multi-channel input signal on the full chart width and the number of channels can easily be chosen as required by using an electronic selector switch which is employed as an automatic input channel selector.

The scope of this experiment is to study and construct a multi-channel recorder capable of recording four electrical input signals simultaneously and each signal is recorded on the full width of the chart. The recorder is aimed primarily for plotting a series of plate characteristics of vacuum triodes.