



APPLICATION NOTES

Application Note 22

USE OF DIGITAL RECORDERS WITH DIGITAL VOLTMETERS

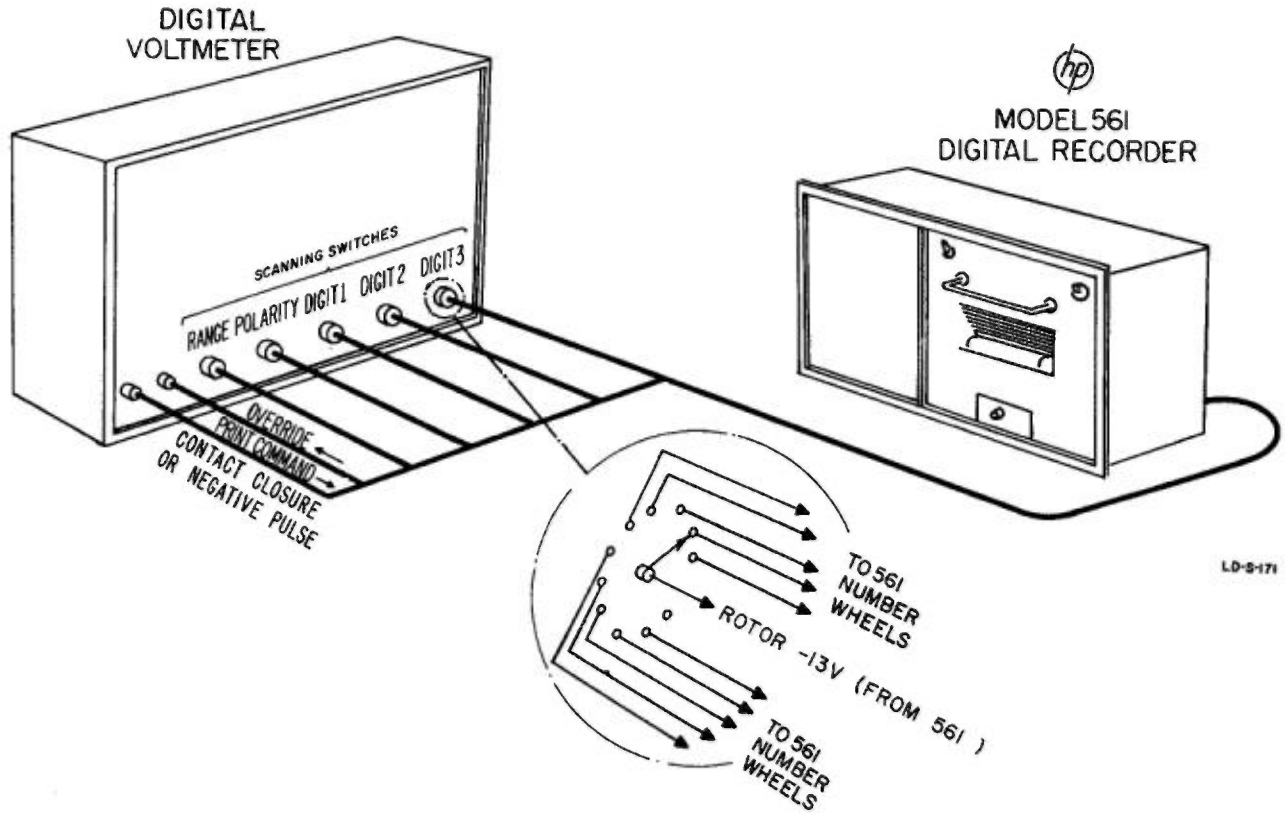
GENERAL DESCRIPTION

In general, most digital voltmeters will operate Hewlett-Packard Digital Recorders provided that the necessary connecting equipment is supplied.

Typical manufacturers of digital voltmeters which are essentially compatible with the Model 560A/561 are Kintel, Non-Linear Systems, Electro Instruments, Cubic Corporation, Electronic Associates and Hewlett-Packard.

USE OF THE 561

Since the Model 561 operates from a 10 line input and since most digital voltmeters use a scanning switch to provide a 10 line code output, the 561 is more directly applicable to digital voltmeters than the 560A. Thus in most cases the 561 is the logical recorder to use to print digital voltmeter readings. It is important to realize that most devices having a decimal type inline presentation can provide the 10 line information necessary to drive the 561. A typical connection is shown in the diagram below.



OPERATION OF THE 561 FROM A DIGITAL VOLTMETER

USE OF THE 560A

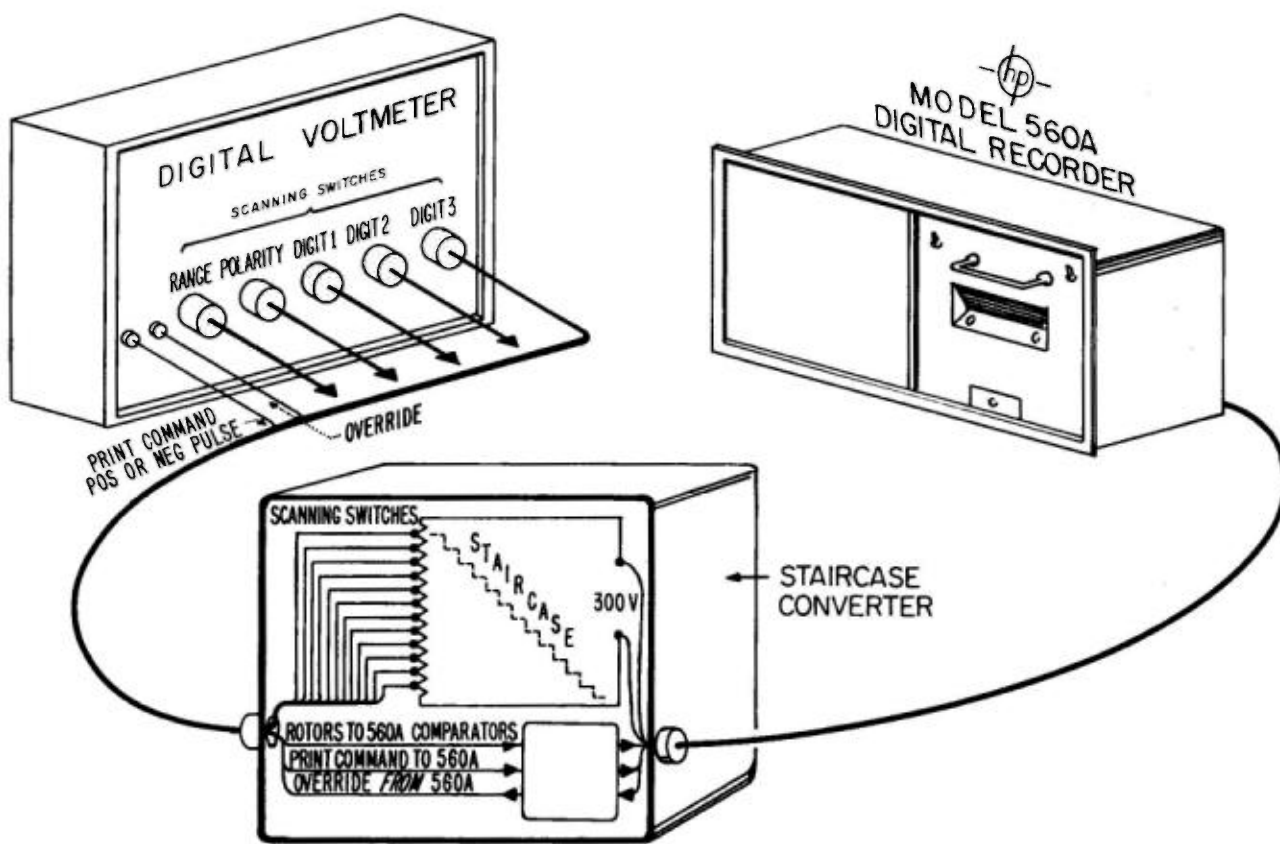
There are applications where the 560A is more desirable than the 561. In general, for digital voltmeter use the Model 560A is usually advantageous in four situations:

1. When the customer already has a 560A.
2. When the customer wants to print ϕ counter outputs with the same 560A.
3. When the customer wants an analog output
4. When the customer wants to enter data sequentially from a number of instruments through a scanning switch. The advantage of the 560A here is that only one switch contact per 560A number wheel column is necessary.

The main requirement for 560A operation from a digital voltmeter is an input staircase voltage. There are two ways to provide the staircase if the digital voltmeter contains mechanical stepping switches.

1. The manufacturer could build the staircase into his digital voltmeter.
2. An external staircase converter with a built in voltage divider could be used between the digital voltmeter and the 560A.

In cases where number two is necessary, ϕ will provide the converter at a reasonable price. The price will typically be around \$100.00 to \$200.00. The actual price will depend, of course, upon the complexity of the unit. The staircase converter and its connections are shown in the following diagram.



OPERATION OF THE 560A FROM A DIGITAL VOLTMETER.

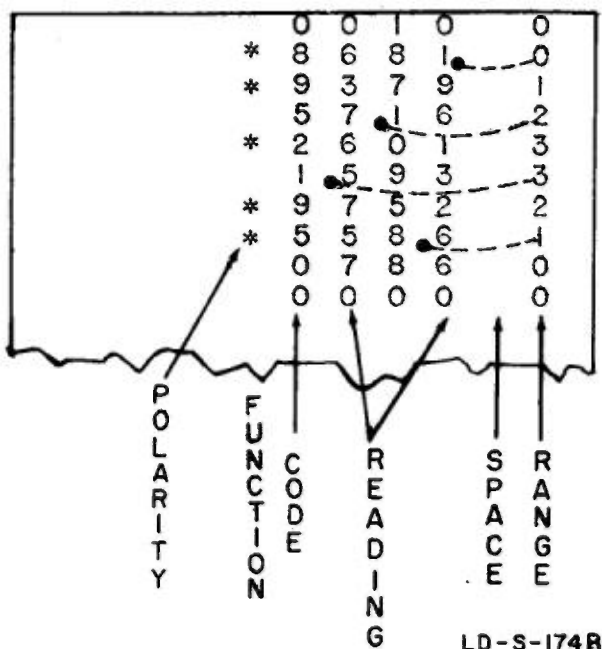
The staircase converter is required to:

1. Convert the digital information to a staircase voltage.
2. Convert the polarity input to either an asterisk or blank.
3. Convert range information to a staircase voltage.
4. Provide a print command and override if necessary.

Since the presentation desired will depend upon the particular customer involved, he should provide a cable to connect his digital voltmeter to the converter so that he can obtain his desired presentation.

PRESENTATION

Since the 560A contains 11 number wheels each having 10 characters plus a blank and an asterisk, it will automatically provide a suitable format for voltmeter applications. A suggested format is shown below.

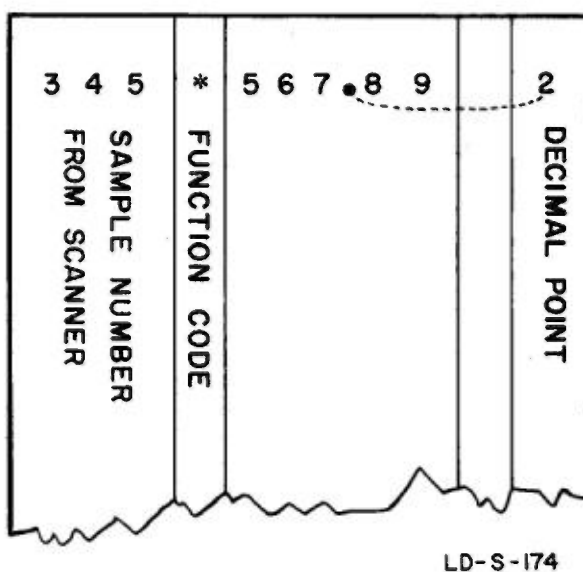


The function code indicates the type of measurement - voltage, current, resistance and so on. A blank indicates positive polarity and an asterisk negative polarity. The number in the range position indicates

the position of the decimal point as shown by the dotted lines. The space is necessary to separate the range from the voltmeter reading.

In cases where it is not possible to leave a space between the voltmeter reading and the range information, lined paper can be obtained with lines to separate the data. We will assist in the procurement of the lined paper if you forward a specific request.

A typical lined presentation is shown below.



SPECIAL WHEELS

The presentation described above is, of course, the easiest because the 560A and 561A both already contain the necessary numbers plus the blank and asterisk. However, if other characters are desired, there are special wheels available. They are described in Application Note 32, Counting and Recording Instrumentation.