

Frequency Measurement

To measure the fundamental frequency of a sine wave or square wave, adjust the time/centimeter and positioning controls of the Tektronix oscilloscope to center the waveform (Figure 30). The oscilloscope horizontal sweep dials indicate the time for the waveform to complete one cycle. The relationship between time in seconds and frequency in cycles per second is as follows:

$$\text{Frequency (cps)} = \frac{1}{\text{Time (seconds)}}$$

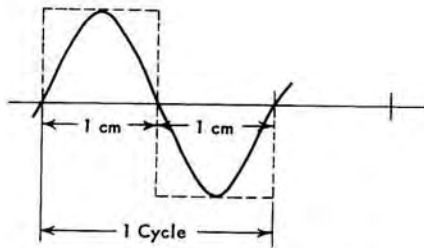


Figure 30. Frequency Measurement

Wire-Wrap

Wire-Wrap is a method of making solderless wire connections to terminals. A special Wire-Wrap tool wraps a length of skinned wire tightly around the square corners of a terminal. The resulting connection is one of the most reliable permanent connections available and is readily adaptable to production line manufacturing. Power tools for making Wire-Wrap connections are available as branch office tools to offices having installed systems that use Wire-Wrap terminal connections.

Wire-Wrap Tool

The Wire-Wrap tool is, basically, a metal rod containing two holes: a small hole for receiving the skinned wire, and a larger hole for receiving the terminal (Figure 31). The metal rod is called the wrapping bit. The skinned wire is

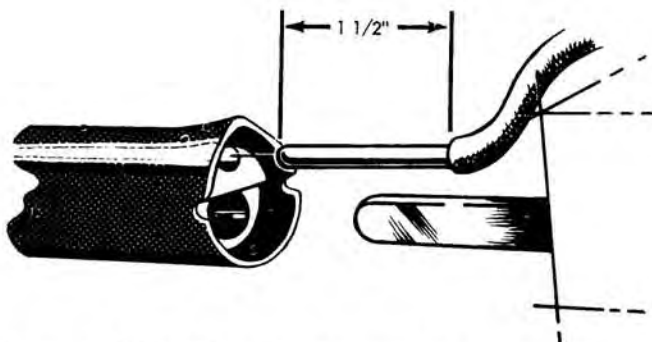


Figure 31. End of Wire-Wrap Wrapping Bit

placed in the wrapping bit. The bit is placed on the terminal and rotated, forming a tightly wrapped coil of wire around the terminal.

The Keller Wire-Wrap tool has an electric motor that drives a wrapping bit. The wrapping bit turns within a sleeve that contains a wire anchoring notch on each side. The notch holds the insulated portion of the lead to prevent the insulation from wrapping around the terminal.

The tool consists of: an electrically operated pistol tool, wrapping bits, and sleeves for the various wire sizes (Figure 32). The pistol tool, P/N 461012, is equipped with a 20 foot, three wire grounding cord.

Wrapping bits and sleeves for use with the above gun are as follows:

| WIRE SIZE | WRAPPING BITS | | SLEEVES | |
|-----------|---------------|------------|---------|------------|
| | IBM P/N | KELLER P/N | IBM P/N | KELLER P/N |
| 26 GA. | 461008 | A-24255 | 461014 | 17611-2 |
| 24 GA. | 461009 | A-17612-2 | 461014 | 17611-2 |
| 22 GA. | 461010 | A-18632 | 461015 | 18840 |
| 20 GA. | 461011 | A-18633 | 461016 | 18285 |

Wire-Wrap Procedure

1. Select the bit and sleeve for the wire size to be used.
2. Install bit and sleeve in the nose assembly of the power tool as follows:
 - a. Loosen the collet nut on the nose assembly.
 - b. Insert the wrapping bit into the collet. Rotate the bit while applying slight pressure against the end until it seats itself. (NOTE: To remove the bit, reverse this process.)
 - c. Place the sleeve over the bit and into the collet. Rotate until sleeve is seated and positioned. With tool running apply slight pressure to the end of the sleeve and tighten collet nut.
3. Skin the wire to desired length. The length of the skinned wire determines the number of turns of wire on the terminal. For example: when using 24 gage wire, about ¼ inch bare wire is required for each turn. Because six turns are required for an acceptable connection, the skinned length should be 1½ inches.
4. Insert the skinned wire into the small hole of the wrapping bit (Figure 33a) taking care to insert the wire up to the insulation. Do not bend the skinned portion of the wire; it may be difficult to slide into the bit.

WARNING: If the wire is not inserted in the wrapping bit up to the insulation, a shiner (bare wire between insulation and terminal) may result. There should be ¼ to ¾ of a turn of insulation at the beginning of each wrap.

5. Hold the wire with the fingers and bend the insulated portion of the lead into the retaining notch in the sleeve (Figure 33b). Use the right or left notch as determined by the direction of the approach (or exit) of the lead. Place the wrapping bit on the terminal. Be sure the terminal is inserted into the bit as far as it will go. Use reasonable care to hold the tool in line with the terminal.

6. Hold the tool on the terminal and squeeze the trigger to wrap the wire on the terminal. The tool will automatically recede as the wire coils on the terminal. Release trigger and remove tool from terminal. The Wire-Wrap connection is complete (Figure 33c).

NOTE: If too much pressure is used to push the tool on the terminal, a turn of wire may wrap over a previous