CARPENTER MFG. CO., INC.
110 Fairgrounds Drive • P.O. Box 188
Manlius, NY 13104-0188
Phone: 315.682.9176 • Fax: 315.682.9160
Email: wire@carpentermfg.com
www.carpentermfg.com

Operator's Manual

Model 970
Compu-Strip®

Production Wire Processing Equipment

Website: www.carpentermfg.com • **Email**: wire@carpentermfg.com

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Introduction

Thank you for choosing Carpenter Mfg. Co., Inc. for your wire processing equipment needs. For over 60 years Carpenter has been a leader in wire processing technology and service. As an independently-owned, third generation company our philosophy has always been to provide the customer with both quality products and outstanding service. We look forward to a long, healthy relationship with you and our company.

The Model 970 Compu-Strip® can process a wide range of cables, as referenced on the following pages. These stripping specifications are based upon the most commonly manufactured cables. Special applications may arise with cables that are within the specification limits of the machine but are very difficult or unsuccessful to strip. Likewise, cables that exceed the specified limits of the machine may sometimes be processed successfully. Because there are many variables involved in wire processing, we strongly recommend a free wire evaluation, to be completed at our factory (http://carpentermfg.com/wire-evaluation/). A demonstration from a Carpenter representative is also recommended to ensure the ultimate success of your wire processing application.

This operating manual explains how to operate the Model 970 Compu-Strip®. To ensure the best performance of your machine, read this manual carefully until you familiarize yourself thoroughly with its operation and features. After you have read through the manual, keep it available for reference.

Use this manual as a quick and handy reference tool for clarifying any questions that may arise. If you have any questions about this machine or service please let us know. Our phone number is (315) 682-9176; we may also be reached by fax at (315) 682-9160. Visit our website (www.carpentermfg.com), or contact us via email (wire@carpentermfg.com).

Carefully unpack the Carpenter Model 970 Compu-Strip®. We recommend that you keep the original box and packaging as it will protect the machine for future transportation, if necessary.

Important Notice

The products in this shipment left our facility in good working condition. Their safe delivery is the responsibility of the carrier that delivered this shipment to you. Our stated shipping terms are F.O.B. our facility at 110 Fairgrounds Drive, Manlius, NY 13104. According to applicable laws, the responsibility for this shipment was transferred to you as soon as the carrier accepted the goods at our warehouse. If concealed damage is discovered after unpacking this shipment, you must submit a damaged freight claim with the carrier. Carpenter Mfg. Co., Inc. cannot submit your claim for you. In order for you to collect for concealed damage, the carrier must be notified with 5 days of the date you receive this shipment. You must leave the damaged items and packing material as is (i.e. return all merchandise and all packing material to the shipping container) until the claim has been inspected by the carrier. It is also important to note that the carrier will not accept a claim if the goods have been moved from the point of the carriers' delivery to another street address. If you have any questions or problems, please give us a call at (315) 682-9176, or email us at wire@carpentermfg.com.

Safety Notice

CAUTION

This equipment comes equipped with a LEXAN safety guard, containing a safety interlock switch. The machine will not operate unless the guard is in the closed position.

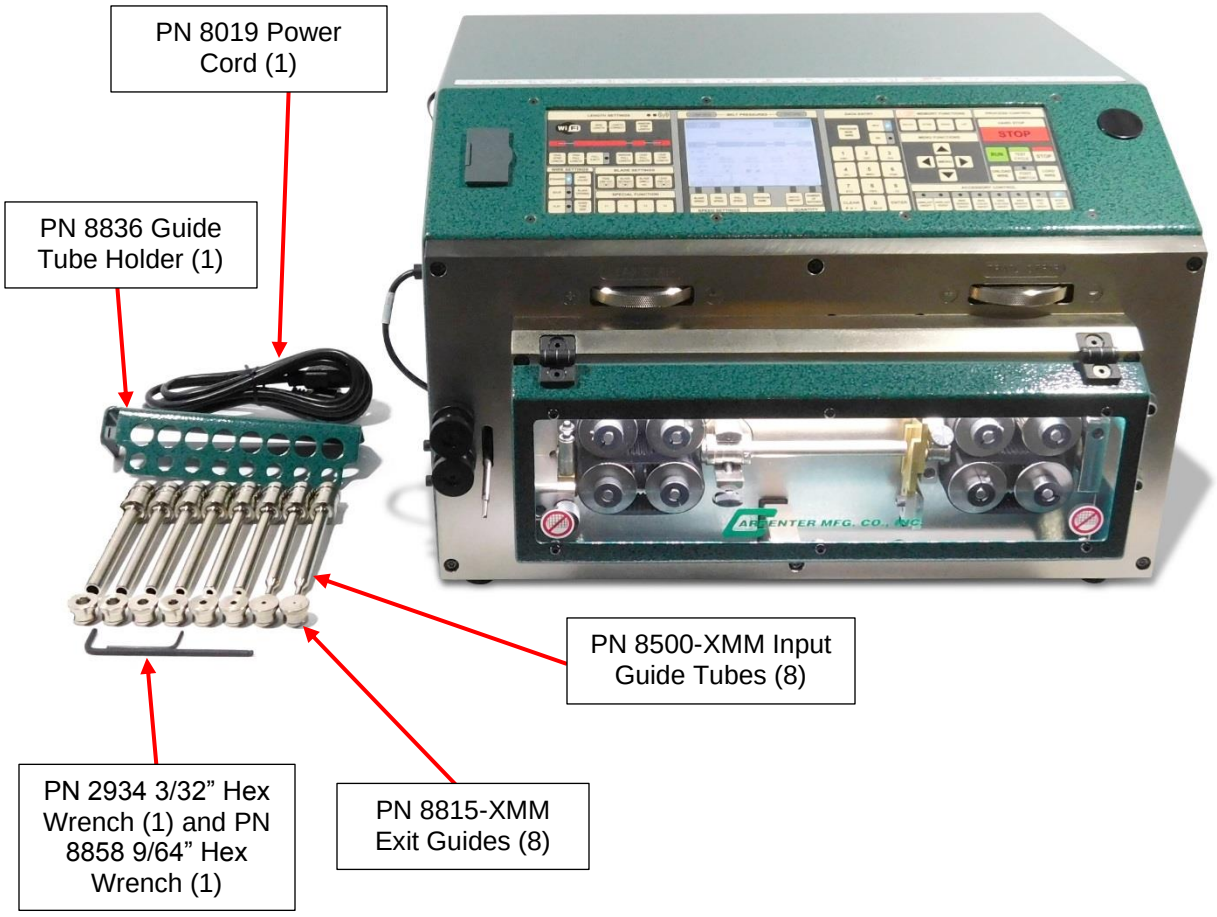
IMPORTANT

Do not attempt to defeat the function or purpose of the safety interlock switch. Serious injury to the operator's eyes, fingers or other body parts may result from attempts to operate this equipment with the safety guard in the raised position.

Machine Contents

Each Carpenter Model 970 Compu-Strip® comes complete with the following:

Quantity	Carpenter Part Number	Description
1	8019	Power Cord
1	8836	Guide Tube Holder
8	8500-XMM	1mm – 8mm Input Guide Tubes
8	8815-XMM	1mm – 8mm Exit Guides
1	2934	3/32” Hex Wrench
1	8858	9/64” Hex Wrench



Applications and Machine Specifications

Applications

The Model 970 Compu-Strip® is designed to cut and strip solid or stranded wire, multi-conductor cable, and flat cable with any of the following applications:

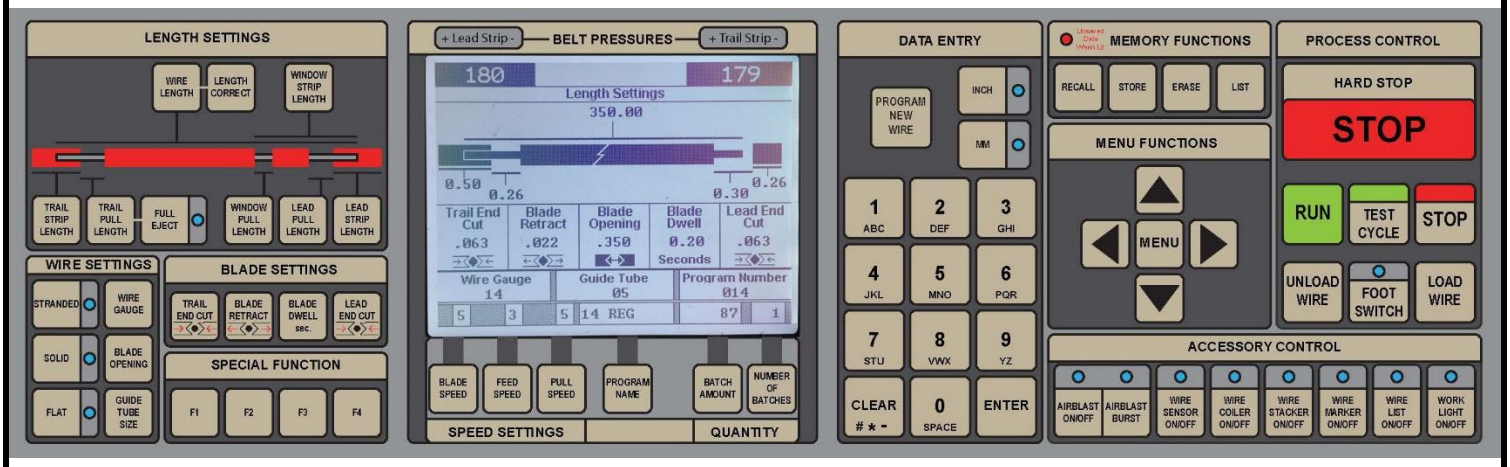
- Cutting wire or tubing to length only;
- Cutting and fully stripping one or both ends;
- Cutting and partially stripping one or both ends;
- Cutting and fully stripping one or both ends with window strip on right;
- Cutting and partially stripping one or both ends with window strip on right.

A motorized prefeed (Carpenter Model 58D) may be necessary to assist the Model 970.

Machine Specifications

Electrical Connection	100 – 240 VAC, 50 – 60 Hz self-adjusting
Air Connection	30 – 50 P.S.I. ****CLEAN** & **DRY****
Main Fuses	(2) 5 x 20 mm 8 AMP fast-acting
Maximum Cable Diameter	0.354” (9 mm), material dependent
Stranded Copper Wire	32AWG – 8AWG, material dependent
Solid Copper Wire	32AWG – 12AWG, material dependent
Flat Cable	Up to 0.500” (12.7 mm) wide, material dependent
Wire Length	0.01” – 9,999.99” (0.20 mm – 99,999.9 mm) [longer lengths obtainable in inches]
Quantity	1 – 999,999 pieces
Leading End Strip Length	0.01” – 6.00” (0.20 mm – 152.4 mm)
Trailing End Strip Length	0.01” – 3.00” (0.20 mm – 76.2 mm)
Unit of Measure	Inches or mm, user-selectable
Transport Speeds	5 programmable
Pull Speeds	5 programmable
Blade Speeds	5 automatic default or user-selectable
Memory	999 programs
Program Stacking	100 programs
Password Protection	User-programmable
Dimensions	17.5” x 16.25” x 11” (437.5 mm x 406.3 mm x 275 mm) [L x D x H]
Weight	68 pounds (31 kilograms)

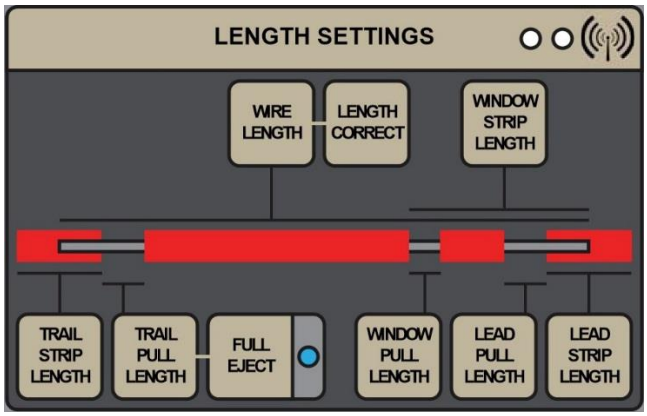
Section 1 – Keypad Display and Button Descriptions

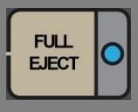


The Model 970 Compu-Strip® features an all-new, easy-to-use electronic control panel. The user-friendly machine software and improved button layout are staples of the Model 970. All standard machine functions now have their own, dedicated keys. This helps to dramatically minimize the time one would spend scrolling through “buried menus” or “hidden screens.”

The following pages contain basic descriptions of each button.

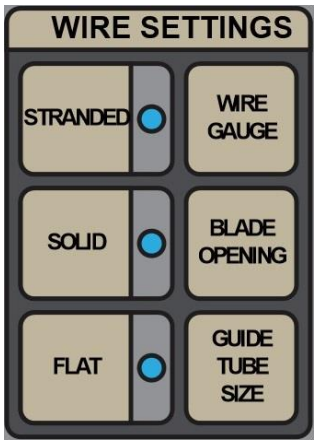
Length Settings

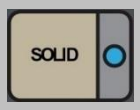
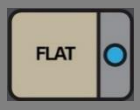


Button	Description
	This value is the overall length of processed pieces.
	This value is the correction for overall length.
	This value is the length of insulation to be stripped from the left end (trailing end) of the wire.
	This value is the distance the slug of insulation is pulled on the trailing end of the wire.
	Selecting this option clears each processed wire from the machine upon stripping operation completion.
	This value is the length of insulation to be stripped from the right end (leading end) of the wire.

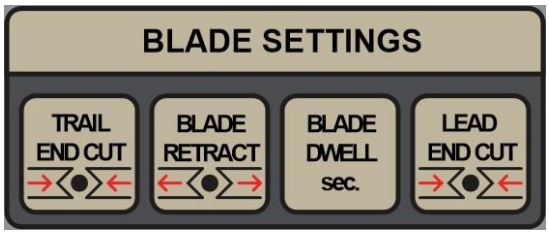
	This value is the distance the slug of insulation is pulled on the leading end of the wire.
	This value is the length or distance from the beginning of the window strip to the right end of the wire.
	This value is the actual length of the window strip or the distance between the beginning of the window strip and left end of the slug.

Wire Settings



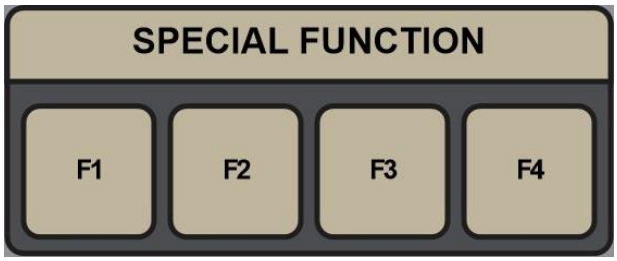
Button	Description
	Select this button if the processed wire is stranded.
	Select this button if the processed wire is solid.
	Select this button if the processed wire is flat.
	This value is the gauge of the processed wire.
	This value is how far the blades open before the wire advances.
	This value is the input guide tube number used to process the wire.

Blade Settings



Button	Description
	This value is the blade depth on the trailing end of the wire.
	Also known as stepback, this value is how far the blades open from the programmed blade depth before the strip is made.
	This value is how long the blades sit at the programmed blade depth before the wire is stripped.
	This value is the blade depth on the leading end of the wire.

Special Function



Button	Description
	This is considered a “soft key.” It is used for multiple functions throughout the machine.
	This is considered a “soft key.” It is used for multiple functions throughout the machine.
	This is considered a “soft key.” It is used for multiple functions throughout the machine.
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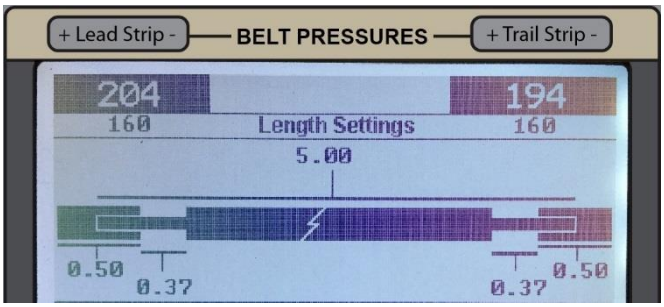
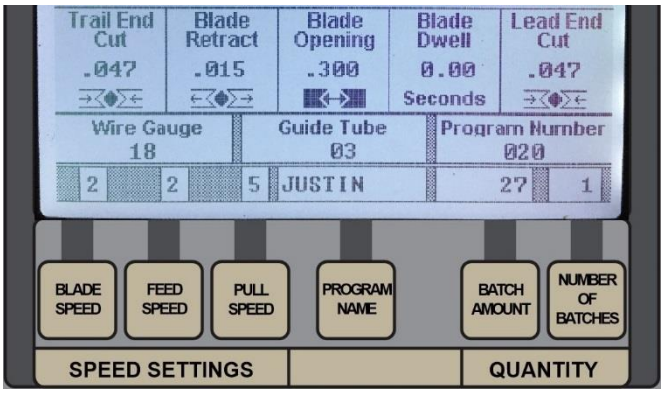
Belt Pressures



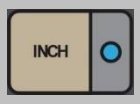
Button	Description
+ Lead Strip -	This value is the grip that the feed belts or feed rollers exert on the leading end of the wire.
+ Trail Strip -	This value is the grip that the feed belts or feed rollers exert on the trailing end of the wire.

Speed Settings and Quantity



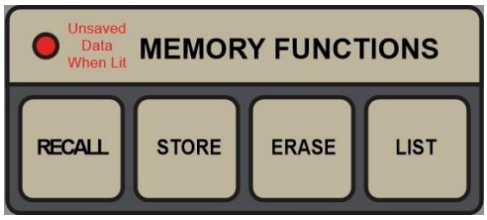
Button	Description
BLADE SPEED	This value is the speed of the blades.
FEED SPEED	This value is the wire transport speed.
PULL SPEED	This value is the stripping speed.
PROGRAM NAME	Selecting this button allows the operator to assign a program an alpha-numeric name.
BATCH AMOUNT	This value is the number of pieces to process.
NUMBER OF BATCHES	This value is how many sets of the programmed batch amount are produced.

Data Entry

Button	Description
	This button enters the Carpenter Wire Wizard, which allows the user to program a new wire step-by-step. See page 26 for more information.
	Select this button if the unit of measurement is inches.
	Select this button if the unit of measurement is millimeters.

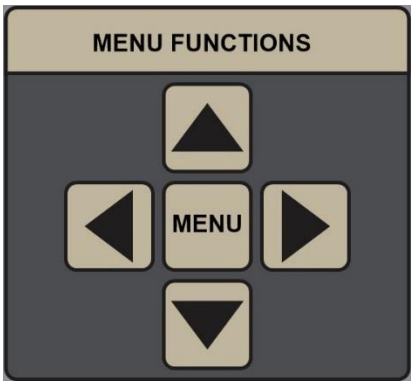
	Alpha-numeric keys 0–9 are used to enter either numbers or letters.
	This button is used to erase data when programming wire values or creating and naming new programs.
	Machine's universal ENTER button.

Memory Functions



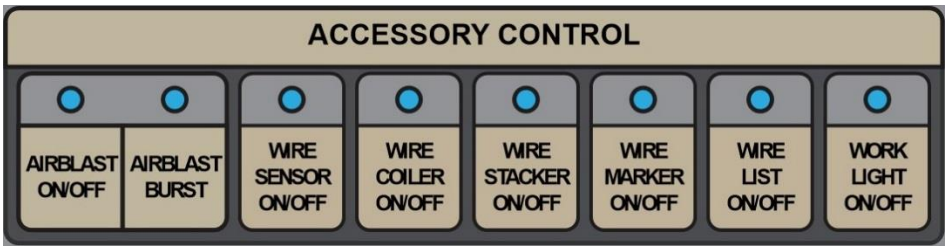
Button	Description
	This function recalls wire programs that have been stored in the machine memory.
	This function stores wire programs to the machine memory.
	This function will erase stored wire programs from the machine memory.
	This function will list on the display all stored wire programs in the machine memory.

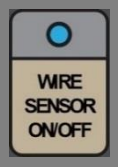
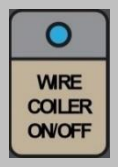
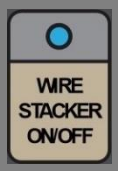
Menu Functions



Button	Description
MENU	Selecting this button enters into the machine menu.

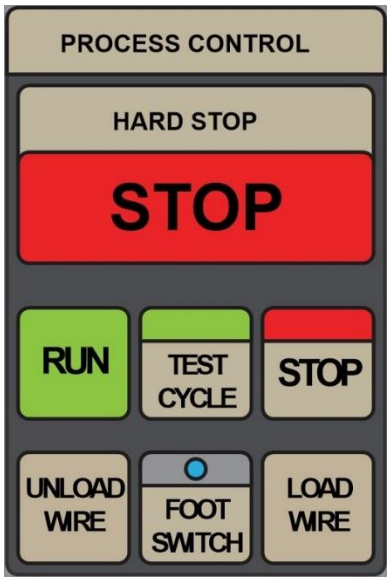
Accessory Control



Button	Description
	This function turns on or off the internal machine air blast. If this option is turned on, a steady stream of air flows whenever the machine is in the run mode.
	This function gives only a blast of air at the specific time the wire is being stripped.
	This function stops the machine when the machine runs out of material.
	This function is used to activate compatibility with the Carpenter Model 80 Single Bowl Wire & Cable Coiler.
	This function is used to activate compatibility with a wire stacker.

	This function is used to activate the Model 970 wire marking software to control hot stamp wire markers.
	This function allows the Model 970 to consecutively process machine-stored programs of the same wire type.
	This function turns the work light on or off.

Process Control



Button	Description
	Pressing this button immediately stops the machine.
	Pressing this button will start the processing cycle. The programmed batch amount is processed.
	Pressing this button will process one complete test wire, according to the programmed settings.
	Pressing this button will stop the processing cycle at the completion of the piece being processed.

	This function is used to clear the loaded wire out of the machine.
	This function is used to control an optional foot switch when processing material. The foot switch also interfaces with the Carpenter Model 80 Single Bowl Wire & Cable Coiler.
	This function is used to load the wire into the machine.

Section 2 – Initial Machine Setup

1. Plug the female end of power cord into the power entry module, located on the left side of the machine. Plug the male end into a proper electrical outlet. Turn on the power switch.

2. The Model 970 comes equipped with eight different input guide tubes. An input guide tube must be used when processing wire. Select the input guide tube with the smallest inside diameter that slips freely over the outside diameter of the wire to be stripped. To change an input guide tube simply loosen the input guide tube thumb screw. After replacement, make sure the thumb screw is securely tightened against the input guide tube.

3. The Model 970 comes equipped with eight different exit guides. Select the exit guide that is numbered the same as the input guide tube selected above. (Example: A #3 input guide tube will use a #3 exit guide). To change an exit guide simply loosen the exit guide thumb screw. After replacement, make sure the thumb screw is securely tightened against the exit guide.

   The exit guide must be removed when processing wire in Short Mode.

   There are possible applications which require using a different input guide tube and exit guide combination.

4. Optional: Install ¼" airline into the fitting on the back side of the machine for use with the air blast feature.

5. Load wire through the input roller guides and place wire underneath the out of material rod. If the wire sensor/out of material feature is off, the wire does not need to be placed underneath the out of material rod. (The wire sensor/out of material feature is discussed in-depth starting on page 45). Feed the wire through the centering roller guides and adjust rollers to center the wire into the entrance of the feed belts. Select the "Load Wire" button and keep it depressed until the wire is completely fed through the machine. Once the wire has exited, release the switch. The Model 970 is now ready to program and process wire.

Section 3 – Program New Wire

****IMPORTANT NOTE****
DO NOT USE SHARP OBJECTS ON KEYPAD. FINGERTIP PRESSURE IS SUFFICIENT.

The Model 970 **PROGRAM NEW WIRE** feature allows the operator to program a new wire step-by-step, using the Carpenter Wire Wizard. To program the machine to process wire, the operator may use this method, or the appropriate method(s) listed in the following section(s). The **PROGRAM NEW WIRE** feature is especially helpful for novice operators. The Carpenter Wire Wizard is simple to use and very effective at programming the Model 970 to process wire.

Carpenter Wire Wizard

1. Press the **PROGRAM NEW WIRE** button in the "Data Entry" section of the keypad. (If there is unsaved work on the machine, a warning will display telling the user to either press **F4** to exit the Wire Wizard, or to press **ENTER** to continue).

2. Following the instructions on the digital display, enter a program name and press **ENTER**.

3. Select the desired wire type (stranded, solid, or flat) using the buttons in the "Wire Settings" section of the keypad and press **ENTER**.

4. Using the numeric keypad, enter the wire size (AWG) and press **ENTER**.

5. Using the numeric keypad, enter the required input guide tube size for the wire to be processed and press **ENTER**.

6. Using the numeric keypad, enter the required blade opening which allows the wire to pass through the blades without scraping or interference and press **ENTER**.

7. Using the numeric keypad, enter the total wire length, or the overall length of the wire to be cut and stripped, and press **ENTER**.

8. Using the "up" and "down" arrow keys in the "Menu Functions" section of the keypad, select the desired leading end strip configuration and press **ENTER**.

    a. If "Partial Strip" is selected, the Wire Wizard will prompt the operator to complete a sequence of steps.

i. Using the numeric keypad, enter the desired leading end strip length and press **ENTER**.

ii. The lead end cut diameter (**LEAD END CUT**) defaults based on the wire gauge and wire type previously selected. To accept this value, press **ENTER**. To change this value, use the numeric keypad and press **ENTER**.

iii. The Wire Wizard will default the leading end pull length to be two-thirds of the leading end strip length. The operator can change this value by pressing the **LEAD PULL LENGTH** button in the "Length Settings" section of the keypad. Using the numeric keypad, enter the desired value and press **ENTER**.

b. If "Full Strip" is selected, the Wire Wizard will prompt the operator to complete a sequence of steps.

i. Using the numeric keypad, enter the desired leading end strip length and press **ENTER**.

ii. The lead end cut diameter (**LEAD END CUT**) defaults based on the wire gauge and wire type previously selected. To accept this value, press **ENTER**. To change this value, use the numeric keypad and press **ENTER**.

c. If "No Strip" is selected, the Wire Wizard will move to the next step.

9. Using the "up" and "down" arrow keys in the "Menu Functions" section of the keypad, select the desired trailing end strip configuration and press **ENTER**.

a. If "Partial Strip" is selected, the Wire Wizard will prompt the operator to complete a sequence of steps.

i. Using the numeric keypad, enter the desired trailing end strip length and press **ENTER**.

ii. The trail end cut diameter (**TRAIL END CUT**) defaults based on the wire gauge and wire type previously selected. To accept this value, press **ENTER**. To change this value, use the numeric keypad and press **ENTER**.

iii. The Wire Wizard will default the trailing end pull length to be two-thirds of the trailing end strip length. The operator can change this value by pressing the **TRAIL PULL LENGTH** button in the "Length

Settings" section of the keypad. Using the numeric keypad, enter the desired value and press **ENTER**.

b. If "Full Strip" is selected, the Wire Wizard will prompt the operator to complete a sequence of steps.

   i. Using the numeric keypad, enter the desired trailing end strip length and press **ENTER**.
   ii. The trail end cut diameter (**TRAIL END CUT**) defaults based on the wire gauge and wire type previously selected. To accept this value, press **ENTER**. To change this value, use the numeric keypad and press **ENTER**.

c. If "No Strip" is selected, the Wire Wizard will move to the next step.

10. Using the numeric keypad, enter the amount of time (in seconds) the blades should dwell after reaching the programmed cut depth and press **ENTER**.

11. Using the numeric keypad, enter the distance the blades should retract from the cut depth before the slugs are pulled to prevent scraping and press **ENTER**.

12. When using the **PROGRAM NEW WIRE** option, the **BLADE SPEED**, **FEED SPEED**, and **PULL SPEED** values all default to 3. If adjustments are necessary for any of these values, manually enter the change(s) at the run screen. This is covered on page 30.

13. Adjust the feed belt/feed roller pressures as necessary.

Section 4 – Programming – Normal Mode

If the operator does not wish to program new wire using the Carpenter Wire Wizard, there are several possible step-by-step combinations to set the machine up for programming in normal mode. The following step-by-step procedure is meant to be used as a guide and is just one of the many ways the machine may be programmed to process wire.

Length Settings

1. Press the **WIRE LENGTH** button. Using the numeric keypad, enter the dimension for the overall length of processed pieces and press **ENTER**.

2. Press the **TRAIL STRIP LENGTH** button. Using the numeric keypad, enter the dimension for the length of insulation to be stripped from the left end (trailing end) of the wire and press **ENTER**.

3. Press the **TRAIL PULL LENGTH** button. Using the numeric keypad, enter the dimension for the distance the slug of insulation is pulled on the trailing end of the wire and press **ENTER**.

    a. The **FULL EJECT** feature may be used when processing long trailing strips on multiconductor cables. When this feature is on, the processed piece is ejected completely from the machine while the input guide tube is in the “up” position.

4. Press the **LEAD STRIP LENGTH** button. Using the numeric keypad, enter the dimension for the length of insulation to be stripped from the right end (leading end) of the wire and press **ENTER**.

5. Press the **LEAD PULL LENGTH** button. Using the numeric keypad, enter the dimension for the distance the slug of insulation is pulled on the leading end of the wire and press **ENTER**.

Wire Settings

1. Select the wire type that is being processed by pressing **STRANDED**, **SOLID**, or **FLAT**. (When **FLAT** is selected, refer to page 36 for further programming instructions).

2. Press the **WIRE GAUGE** button. Using the numeric keypad, enter the wire gauge of the processed wire and press **ENTER**.

3. Press the **BLADE OPENING** button. Using the numeric keypad, enter the dimension for how far the blades open before the wire advances and press **ENTER**.

4. Press the **GUIDE TUBE SIZE** button. Using the numeric keypad, enter the input guide tube number used to process the wire and press **ENTER**.

Blade Settings

1. The **TRAIL END CUT** (trail end blade depth) and **LEAD END CUT** (lead end blade depth) values default to a preset nominal value based upon the wire gauge previously entered. To change each individually, press either **TRAIL END CUT** or **LEAD END CUT**. Using the numeric keypad, enter the desired value and press **ENTER**. (To open the blades, enter a higher value. To close the blades, enter a lower value).

2. Press the **BLADE DWELL sec**. button. Using the numeric keypad, enter a value for how long the blades sit at the programmed blade depth before the wire is stripped and press **ENTER**.

3. Press the **BLADE RETRACT** (stepback) button. Using the numeric keypad, enter a value for how far the blades open from the programmed blade depth before the strip is made and press **ENTER**.

Speed Settings and Quantity

1. Press the **BLADE SPEED** button. Using the numeric keypad, enter a value for the speed of the blades and press **ENTER**. (The value must be between 1 and 5; 1 is the slowest setting and 5 is the fastest setting).

2. Press the **FEED SPEED** button. Using the numeric keypad, enter a value to control the wire transport speed and press **ENTER**. (The value must be between 1 and 5; 1 is the slowest setting and 5 is the fastest setting).

3. Press the **PULL SPEED** button. Using the numeric keypad, enter a value to control the stripping speed/pull force and press **ENTER**. (The value must be between 1 and 5; 1 exerts maximum pulling force and 5 exerts minimum pulling force).

4. Press the **BATCH AMOUNT** button. Using the numeric keypad, enter a value for the number of wires to be processed and press **ENTER**.

5. Press the **NUMBER OF BATCHES** button. Using the numeric keypad, enter a value for how many sets of the programmed batch amount will be produced and press **ENTER**. (If the number of batches is greater than 1, a screen will show on

the display after finishing a batch that will prompt the user to either press **RUN** to continue to the next batch or **ENTER** to pause the next batch).

Feed Belt/Feed Roller Pressures

1. Feed belt/feed roller pressure is adjusted by turning the knobs on the front of the machine labeled “LEAD STRIP” and “TRAIL STRIP.” The display readings will increase or decrease as you turn the knobs left or right, respectively. The current pressures are shown on the digital display under “+ Lead Strip –” and “+ Trail Strip –”.

   When there are numbers displayed on either side of the “Length Settings” section of the digital display, these are stored pressures for the program that was recalled. (Memory functions are discussed in-depth starting on page 37). Turn the pressure knobs to the correct values.

   a. The goal is to achieve enough pressure to hold the wire and remove any insulation. Too little pressure allows the wire to slip between the feed belts/feed rollers. Slippage may cause incorrect **TRAIL PULL LENGTH** or **LEAD PULL LENGTH** dimension. Too much pressure may cause the wire to not track straight through the machine, and may cause premature belt or roller wear.

Process Control

1. Press the **TEST CYCLE** button to produce one complete sample wire to check for accuracy. If overall length corrections are necessary, proceed to the “Length Settings” section of the keypad and press **LENGTH CORRECT**.

2. After pressing **LENGTH CORRECT**, using the numeric keypad, enter the value for the overall length of the processed wire. For example, if the programmed overall length of the wire was 6.00 inches but the sample wire measured at 6.10 inches, enter 6.10 and press **ENTER**. The Model 970 will automatically calculate the necessary correction.

3. Due to differences in material compositions, corrections may be required for strip lengths.

   If corrections are necessary for anything but overall length, select the corresponding key on the keypad to make the adjustment(s).

   Example: A processed piece was programmed to have a trail strip length of 2.78”, but the measured length was actually 2.73”. Press the **TRAIL STRIP LENGTH** button and, using the numeric keypad, enter 2.83.

Example: A processed piece was programmed to have a lead strip length of 3.43”, but the measured length was actually 3.49”. Press the **LEAD STRIP LENGTH** button and, using the numeric keypad, enter 3.37.

4. After a satisfactory wire sample is produced and all settings are correct, press the **RUN** button.

5. Press the **STOP** button (next to **TEST CYCLE**) at any time to stop the processing and wire feed. The current piece will finish processing. (The **HARD STOP** button is for use when the machine must be immediately stopped).

6. Press and hold the **UNLOAD WIRE** button to feed loaded wire backwards through the machine.

Section 5 – Programming – Short Mode

When the salvageable insulation is less than 1.60 inches, the Model 970 will enter Short Mode.

Example: The overall length of a processed piece of wire is 2.50 inches. The trailing strip length is 0.55 inches, and the leading strip length is 0.50 inches. There will be 1.45 inches (2.50 – 1.05) of salvageable insulation left over, so the machine enters Short Mode.

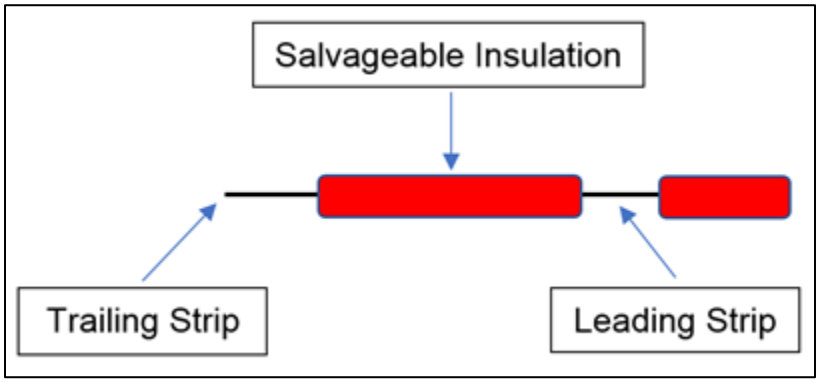


Figure 1: Salvageable Insulation Diagram

To process in Short Mode, a few modifications must be made to the trailing end of the machine.

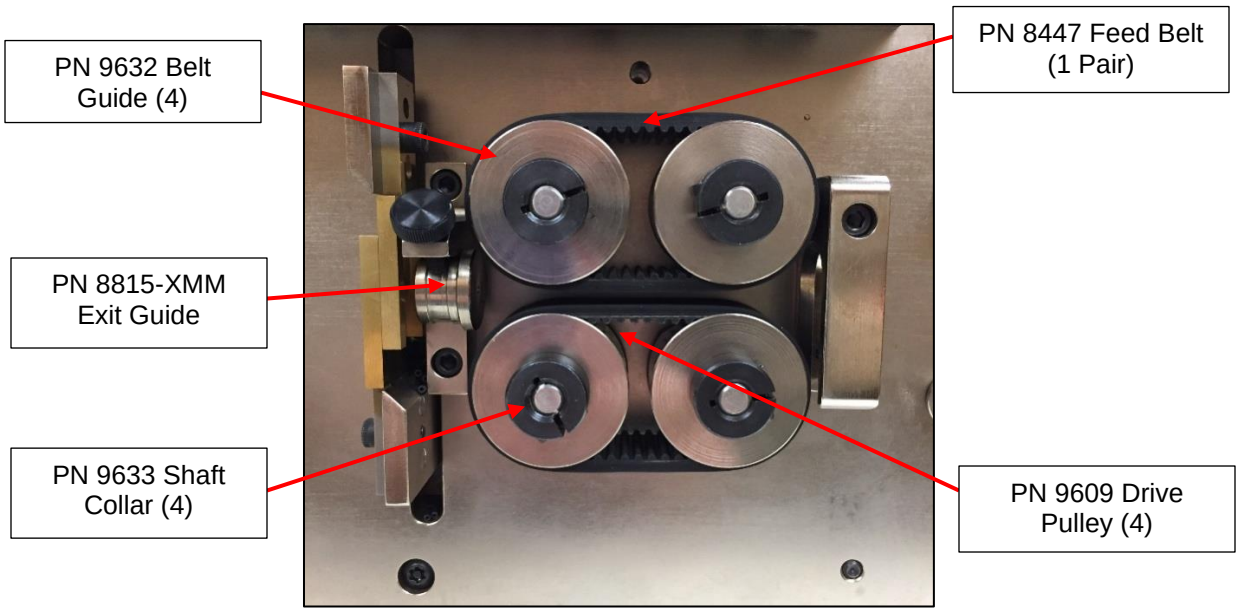


Figure 2: Normal Machine Setup Prior to Short Mode

1. Remove the trailing end PN 9633 shaft collars with the PN 2934 3/32” hex wrench, and remove the PN 9632 belt guides.

2. Remove the PN 8447 feed belt pair (or feed rollers), the PN 9609 drive pulleys, and the PN 8815-XMM exit guide (replace “X” with the exit guide number used).

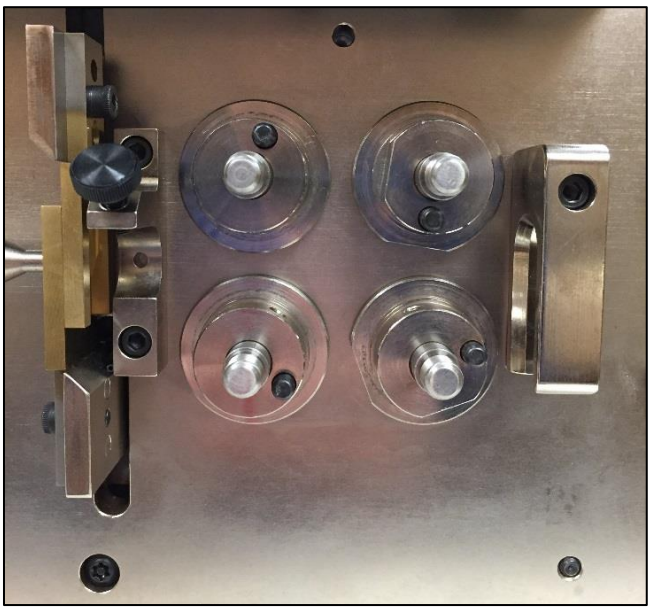


Figure 3: Machine Ready for Short Mode

Programming the machine for Short Mode is very similar to programming the machine for normal mode. Follow the same steps listed in “Section 4 – Programming – Normal Mode,” but notice these important differences:

1. When programming for short mode, do not enter a value for **TRAIL PULL LENGTH** (the value automatically defaults to the **TRAIL STRIP LENGTH** value).

2. The **FULL EJECT** feature is not used in Short Mode.

Section 6 – Programming – Window Strip Mode

The Model 970 has the ability to perform a window strip on a processed piece of wire. Refer to Figure 4 below to view an example of a window strip.

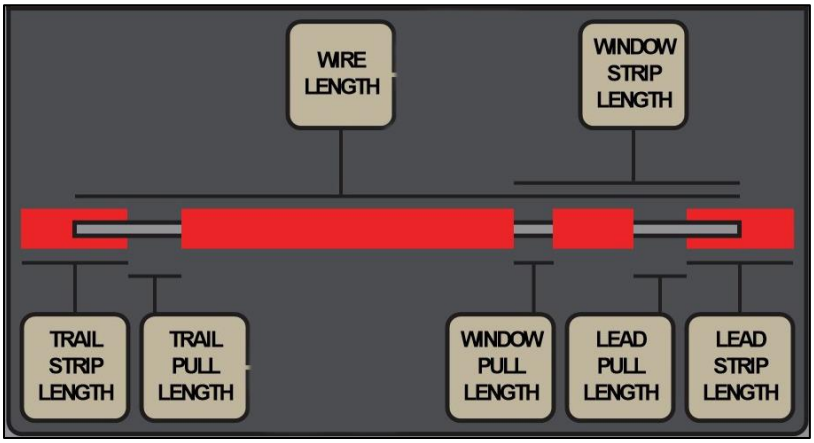


Figure 4: Wire with Window Strip

The trailing end of the machine must be setup the same way as when processing wire in Normal Mode (i.e. do not remove the parts as shown in the Short Mode pictures above).

Programming the machine for Window Strip Mode is very similar to programming the machine for Normal Mode. Follow the same steps listed in "Section 4 – Programming – Normal Mode," but notice these important differences:

1. Press the **WINDOW STRIP LENGTH** button. Using the numeric keypad, enter the dimension for the length or distance from the beginning of the window strip to the right end of the wire and press **ENTER**.

2. Press the **WINDOW PULL LENGTH** button. Using the numeric keypad, enter the dimension for the actual length of the window strip.

Section 7 – Programming – Flat Cable Mode

The Model 970 has the ability to strip flat cable. A flat cable stripping kit must be purchased and installed to process flat cable.

A custom blade set must be purchased separately.

To set the Model 970 up for Flat Cable Mode the above items must be installed. Remove the corresponding items from the current setup and replace with the Flat Cable Mode accessories.

Programming the machine for Flat Cable Mode is very similar to programming the machine for Normal Mode. Follow the same steps listed in "Section 4 – Programming – Normal Mode," but notice these important differences:

1. There is no **WIRE GAUGE** value to be entered when processing cable in Flat Cable Mode.

2. The **LEAD END CUT** and **TRAIL END CUT** values are determined differently in Flat Cable Mode than in Normal Mode. The operator will need to measure the diameter of the conductors of the cable that will be stripped. Using the numeric keypad, enter the measured value and press **ENTER**.

Section 8 – Memory Functions

The Model 970 allows users to create, store, recall, and erase custom programs. After programming a wire or cable to be stripped in Normal Mode, Short Mode, Window Strip Mode, or Flat Cable Mode, the settings may be saved and stored for future use.

Storing Programs

1. After the settings are correct and the program is ready to be saved and stored in the machine memory, press the **PROGRAM NAME** button under the digital display. Using the numeric keypad, enter the name that the program will be stored under and press **ENTER**. (The numbered keys are alpha-numeric, allowing for both numbers and letters to be typed into the program name).

2. After the program is given a name, press the **STORE** button in the "Memory Functions" section of the keypad. Using the numeric keypad, enter the number that the program will be stored under and press **ENTER**. (If a stored program already uses the number typed in by the operator, the digital display will show the operator how to either overwrite the existing program or cancel).

Recalling Programs

When recalling a program, there will be an alert that displays, prompting the operator to change the feed belt/feed roller pressures to the stored pressures for the recalled program. (This alert only displays if the feed belt/feed roller pressure setting is different between the two programs). Turn the pressure knobs to the correct values. Finally, be sure to use the correct input guide tube and exit guide after recalling a program. There are two options for the machine operator to choose to recall a stored program.

1. Press the **RECALL** button in the "Memory Functions" section of the keypad. Using the numeric keypad, enter the program number that is to be recalled and press **ENTER**.

2. Press the **LIST** button in the "Memory Functions" section of the keypad. Using the directional buttons in the "Menu Functions" section of the keypad, highlight the stored program that is to be recalled and press **ENTER**.

Erasing Programs

There are two options for the machine operator to choose to erase a stored program.

1. Press the **ERASE** button in the "Memory Functions" section of the keypad. Using the numeric keypad, enter the program number that is to be erased and

press **ENTER**. (The digital display will allow the machine operator to either continue deleting the program or cancel).

2. Press the **LIST** button. Using the directional buttons in the "Menu Functions" section of the keypad, highlight the stored program that is to be erased and press **ERASE**. (The digital display will allow the machine operator to either continue deleting the program or cancel).

Section 9 – Menu Functions

The Model 970 **MENU** feature allows the operator to view and change certain settings, as well as setup accessories to run with the Model 970. To view the machine menu, press the **MENU** button. To enter into or exit out of each subsection within the **MENU**, follow the instructions on the digital display.

General Settings

1. When the machine is idle, the wire and the feed belts are compressed in a static state. Depending on the wire, feed belts, and how long the machine has been sitting idle, the lead strip of the first piece run may end up slightly short. The zero cut option, when turned on, forces the machine to feed a short length (about 1/8") of wire and cuts it off before the actual piece(s) are processed. This helps to synchronize the lead strip of the first piece to the continuous measure, cut, and strip cycle that all of the following pieces see. To turn the zero cut setting on or off, highlight the option and press **ENTER**. Follow the prompts on the digital display to toggle the zero cut on or off.

2. The wire stacker feature is discussed in-depth starting on page 48.

3. The Model 970 features a feed belt material transport. For certain applications, especially those with small gauge wire, feed rollers are available for purchase. For more information on equipping the Model 970 with feed rollers, navigate to page 55.

    a. Before processing, it is important to make sure this setting is correct. Highlight the "Feed Belt/Roller Selection" option and press **ENTER**.

    b. When processing with feed belts, highlight the "Feed Belts" option and press **ENTER**. When processing with feed rollers, highlight "Feed Rollers" and press **ENTER**.

    c. When processing with feed belts, the icon below will appear in the upper-righthand corner of the run screen.

    d. When processing with feed rollers, the icon below will appear in the upper-righthand corner of the run screen.

4. When processing wire, it may be beneficial to view the processing cycle in slow-motion, step-by-step fashion. This feature is known as delayed step cycle. To activate or deactivate the **F1** soft key to use the delayed step cycle feature, highlight the option and press **ENTER**. Follow the prompts on the digital display to toggle the delayed step cycle on or off.

    a. When this option is turned on, before pressing the **TEST CYCLE** or **RUN** buttons to process wire, the operator may press **F1** to run and view the delayed step cycle.

5. For jacket material that pulls harder than most material, the trailing strip may be broken up into as many as nine sections by activating the multi-cut trail strip feature. To activate or deactivate the **F2** soft key to use the multi-cut trail strip feature, highlight the option and press **ENTER**. Follow the prompts on the digital display to toggle the multi-cut trail strip on or off.

    a. When this option is turned on, before pressing the **TEST CYCLE** or **RUN** buttons to process wire, the operator may press **F2** to enter the number of cuts to divide the trail strip into.

6. For jacket material that pulls harder than most material, the leading strip may be broken up into as many as nine sections by activating the multi-cut lead strip feature. To activate or deactivate the **F3** soft key to use the multi-cut lead strip feature, highlight the option and press **ENTER**. Follow the prompts on the digital display to toggle the multi-cut trail strip on or off.

    a. When this option is turned on, before pressing the **TEST CYCLE** or **RUN** buttons to process wire, the operator may press **F3** to enter the number of cuts to divide the lead strip into.

USB Thumb Drive Functions

The Model 970 USB disk drive port is compatible with many/most USB disk drives with the following specifications:

USB Specification	USB2.0 or USB3.0
Capacity	32 GB (maximum) or less
Format	FAT32
Allocation Unit Size	16 kilobytes

Most USB disk drives may be formatted in one of several different format configurations, and many different allocation unit sizes. Thus it is important, when using for the first time a USB disk drive that was not supplied by Carpenter Mfg. Co., Inc., to perform a full format (uncheck the "Quick Format" checkbox) of the USB disk drive to the FAT32 format using a 16 kilobyte allocation unit size, before attempting to use the device with the Carpenter equipment. Future formats can use the "Quick Format" option. The USB disk drive must be formatted on a Windows computer and cannot be formatted directly by the Model 970.

WARNING: The disk format operation will permanently erase all files stored on the USB disk drive. If any existing files on the disk must be preserved, before performing a disk format operation, backup all files from the USB disk drive to a different disk in your computer or to an external storage device.

If, when attempting to format the disk on the Windows computer, the FAT32 format option is not available on the format menu, the disk is NOT compatible with the Model 970 USB disk drive port.

Due to the large variety of USB disk drive memory types and I/O controllers found on the devices, as well as the variety of manufacturers and qualities of these devices, not all USB disk drives meeting the above parameters are guaranteed to work with the Model 970. It is suggested that, for maximum compatibility, a USB disk drive is obtained from Carpenter Mfg. Co., Inc. for exclusive use with the Carpenter equipment.

The below steps require the use of a correctly formatted (outlined above) USB disk drive.

Programs developed and stored in the machine memory may be easily copied to a USB disk drive for simple backup, transfer to another machine, and/or transfer to an external PC for extra storage space and security. Furthermore, machine software and firmware are easily updated via the use of a USB disk drive.

If the operator highlights the USB Thumb Drive Functions option and selects it by pressing **ENTER** without a USB disk drive plugged into the USB disk drive port, the

digital display will prompt the operator to insert the USB disk drive to continue, or press F4 to quit.

Alternately, the operator may plug the USB disk drive into the USB disk drive port when at the main run screen. When the USB disk drive is recognized, the USB Thumb Drive Functions menu will show on the screen.

When the USB disk drive is connected to the machine, the operator will have five options to choose from.

1. To take one program from the machine memory and copy it onto the USB disk drive, highlight “Send ONE program to USB disk” and press **ENTER**.

    a. Using the numeric keypad, enter the program number previously stored in the machine memory that will be copied onto the USB disk drive and press **ENTER**. The file name created on the USB disk drive will be the program number (as stored in the Model 970) with the extension “.MEM” (e.g., “002.MEM”). To cancel, press **F4**.

2. To take one program from the USB disk drive and load it onto the run screen, highlight “Load ONE program from USB disk” and press **ENTER**.

    a. Using the numeric keypad, enter the program number previously stored on the USB disk drive (such as “002.MEM”) that will be loaded onto the run screen and press **ENTER**. To cancel, press **F4**.

    b. If the feed belt/feed roller pressures need to be adjusted, there will be an alert that displays, prompting the operator to change the feed belt/feed roller pressures to the stored pressures for the loaded program. Turn the pressure knobs to the correct values and press **ENTER**.

    c. It is important to note that loading one program from the USB disk drive onto the load screen does not automatically store that program in the machine memory. To store the loaded program, follow the steps on page 37.

3. To take all of the programs and all of the wire lists from the machine memory and copy them onto the USB disk drive, highlight “Send ALL programs to USB disk” and press **ENTER**. The digital display will then show the progress of the data transfer. The file name created on the disk will be “WIREDATA.MEM”.

4. To take all of the programs from the USB disk drive and copy them into the machine memory, highlight “Read ALL programs from USB disk” and press **ENTER**.

a. If a file named “WIREDATA.MEM” is found on the USB disk drive, the operator will receive a caution message before proceeding forward with this option. To overwrite all machine memory and wire list locations, press **ENTER**. To cancel, press **F4**. If the operator chooses to transfer the data to the machine, the digital display will show the progress of the data transfer. If the file “WIREDATA.MEM” is not found on the USB disk drive, an error message will be displayed.

5. Instructions on how to update the machine software/firmware are available on page 51.

Wire Marker Setup

The Wire Marker feature is discussed in-depth starting on page 49.

Wire List Setup

The Wire List feature is discussed in-depth starting on page 45.

Password Setup

An operator has the ability to password-protect the Model 970. Turning the operational password on ensures an operator will not make any program changes without first entering the saved machine password.

1. To turn the password on or off, highlight the option and press **ENTER**. Follow the prompts on the digital display to toggle the operational password on or off.

2. To set a new password, highlight the option and press **ENTER**. Follow the prompts on the digital display to change the operational password.

    a. The default password from the factory is 123. If it is the first time changing the password since purchase, enter 123 and press **ENTER**. Using the numeric keypad, enter up to a four number, new machine password and press **ENTER**.

    b. If the password is different than the factory default, enter the existing password and press **ENTER**. Using the numeric keypad, enter up to a four number, new machine password and press **ENTER**.

If the machine password is forgotten, contact the factory via email at sales@carpentermfg.com, or by phone at (315) 682-9176.

Representative Access

This submenu is to be accessed only by trained Carpenter Mfg. Co., Inc. sales representatives.

Reserve Access

This submenu is to be accessed only by Carpenter Mfg. Co., Inc. staff.

Section 10 – Accessory Control

The Model 970 offers multiple special features and the ability to work in conjunction with various wire stripping accessories. The machine has an air blast feature, a wire sensor/out of material feature, a program stacking feature, and a work light feature.

There are controls in place for the Model 970 to work in conjunction with a Carpenter Model 80 Single Bowl Wire & Cable Coiler, a wire stacker, and a wire marker. **To interface the Model 970 with any of the above controls**, **a PN 9686 expansion board kit must be purchased from Carpenter Mfg**. **Co**., **Inc**. The expansion board kit is to be used only in conjunction with Carpenter-approved equipment.

Air Blast

This feature is used to clear away insulation slugs when performing a full strip on the leading end of the wire. The air blast is not always necessary. There are two options for the machine operator to choose from when using the air blast feature.

1. Press the **AIRBLAST ON/OFF** button for a steady stream of air that flows whenever the machine is in the run mode.

2. Press the **AIRBLAST BURST** button for only a blast of air at the specific time the wire is being stripped.

Wire Sensor

The wire sensor/out of material feature allows the Model 970 to automatically stop processing when the machine runs out of material. If the **WIRE SENSOR ON/OFF** button is not pressed, the machine will continue to run without material and finish the current program until the programmed amount reaches zero. If the wire sensor/out of material feature is off, material does not need to be fed underneath the out of material rod.

Wire List

The Model 970 offers a wire list (program stacking) feature. This allows the machine operator to consecutively process machine-stored programs of the same wire type. The machine operator may stack up to 100 different programs of the same wire type. To use the wire list (program stacking) feature, press the **MENU** key, highlight the “Wire List Setup” option, and press **ENTER**.

1. To create a new wire list, highlight the “Create new wirelist” option and press **ENTER**.

a. Follow the instructions on the digital display, enter a wire list name and press **ENTER**.

b. Using the numeric keypad, enter the stored program number to recall for the first wire in the list and press **ENTER**.

    i. Using the numeric keypad, enter the number of pieces of this wire to process and press **ENTER**.

c. Using the numeric keypad, enter the stored program number to recall for the second wire in the list and press **ENTER**.

    i. Using the numeric keypad, enter the number of pieces of this wire to process and press **ENTER**.

d. Repeat the above steps for the programs that will be included in the wire list. When there are no more programs to include, simply press **ENTER**.

e. If a program is incompatible with the other program(s) stored before it in the wire list, the operator will receive an error message showing which data are incompatible. Press **ENTER** to return to the program recall portion of the new wire list setup.

2. To view or edit existing wire lists, highlight the "View or Edit existing wirelists" option and press **ENTER**. The Wirelist Directory displays the number and name for each wire list in the machine memory. The operator may edit a stored wire list name, edit the contents of a wire list, or delete a wire list.

    a. To edit a wire list name, highlight a wire list and press **F1**. Follow the instructions on the digital display to edit the wire list name and press **ENTER**.

    b. To edit the contents of a wire list, highlight a wire list and press **F2**. The Wirelist Program Detail displays the list location, the program number, the program name, and the quantities of all programs in the stored wire list.

        i. To edit a program number in the wire list, highlight the program and press **F1**. Using the numeric keypad, enter the new program number and press **ENTER**. If the new entered program is incompatible with the other programs stored in the wire list, the operator will receive an error message showing which data are incompatible. Press **ENTER** to return to the Wirelist Program Detail.

        ii. To edit a program quantity, highlight the program and press **F2**.

1. Using the numeric keypad, enter the number of pieces of this wire to process and press **ENTER**.

iii. To add a program to, or delete a program from, the wire list, press **F3**.

1. To add a program to the wire list, press **F1**.

a. Using the numeric keypad, enter the stored program number to recall for the new program to be added to the wire list and press **ENTER**. If the new entered program is incompatible with the other programs stored in the wire list, the operator will receive an error message showing which data are incompatible. Press **ENTER** to return to the Wirelist Program Detail.

2. To delete a program from the wire list, press **F2**. Follow the instructions on the digital display to either delete the program from the wire list or cancel the delete operation.

c. To delete a wire list entirely, press **F3**. Follow the instructions on the digital display to either delete the program from the wire list or cancel the delete operation.

3. To set or disable an active wire list, highlight the “Set or Disable active wirelist” option and press **ENTER**. The Wirelist Directory displays the number and name for each wire list in the machine memory.

a. To set an active wire list, highlight a wire list and press **F1**. The digital display will show the Wire List Setup menu, and will show the active wire list at the top of the display.

b. To disable the active wire list, simply press **F2**. The digital display will show the Wire List Setup menu, and will show the active wire list as disabled at the top of the display.

4. To set the wire list to continuous run mode, highlight the “Set Continuous run mode” option and press **ENTER**. The digital display will show the wire list run mode as continuous at the top of the display. When set to continuous run mode, the Model 970 will automatically process all wire list programs without operator assistance.

5. To set the wire list to paused (manual) run mode, highlight the “Set Paused run mode” option and press **ENTER**. The digital display will show the wire list run

mode as paused at the top of the display. When set to paused run mode, the operator will be required to press **RUN** at the completion of each program to process the next program, or press **ENTER** to pause the next program.

Work Light

The blade and wire transport areas illuminate when the **WORK LIGHT ON/OFF** button is activated.

Wire Coiler

The Model 970 will interface with Carpenter's Model 80 Single Bowl Wire & Cable Coiler.

To interface the Model 970 with Carpenter's Model 80 Single Bowl Wire & Cable Coiler, a PN 9614 coiler interface cable and a PN 9686 expansion board kit must be purchased from Carpenter Mfg. Co., Inc. (The cable and kit come included with the purchase of a Model 80 Single Bowl Wire & Cable Coiler.

To activate the interface between the Model 970 and the Model 80, install the interface cable between both units after the expansion board kit is installed. Plug the cable into any one of the (5) auxiliary inputs on the Model 970 expansion board kit.

When the Model 80 Single Bowl Wire & Cable Coiler is turned on and correctly interfaced with the Model 970, activate the **WIRE COILER ON/OFF** button to enable use of the Model 80 in conjunction with the Model 970.

Carpenter Mfg. Co., Inc. offers an optional foot switch assembly. This assembly interfaces with the Model 80. When connected, simply activate the **FOOT SWITCH** button, located in the "Process Control" section of the keypad.

Wire Stacker

The Model 970 offers the capability to interface with a wire stacker to collect longer wire lengths. The electrical interface necessary to add this equipment must be purchased separately and installed at the factory.

To interface the Model 970 with a wire stacker, a PN 8988 wire stacker interface cable and a PN 9686 expansion board kit must be purchased from Carpenter Mfg. Co., Inc.

To activate the interface between the Model 970 and a wire stacker, install the interface cable between both units. Plug the cable into any one of the (5) auxiliary inputs on the Model 970 expansion board kit.

1. Press the **MENU** button, highlight the “General Settings” option, and press **ENTER**.

2. Navigate to the “Wire Stacker Dump Time” option and press **ENTER**.

    a. Using the numeric keypad, enter the wire stacker dump activation time (up to 2.50 seconds) and press **ENTER**. This time is determined by how long it takes the stacker to complete its cycle for the current wire being processed.

3. When the above step is complete, simply press the **WIRE STACKER ON/OFF** button to turn this option on and off.

Wire Marker

The Model 970 is capable of interfacing with various hot stamp wire marking units.

To interface the Model 970 with a wire marker, **a PN 9613 wire marker interface cable and a PN 9686 expansion board kit must be purchased from Carpenter Mfg**. **Co**., **Inc**.

To activate the interface between the Model 970 and a wire marker, install the interface cable between both units. Plug the cable into any one of the (5) auxiliary inputs on the Model 970 expansion board kit.

1. Press the **MENU** button, highlight the “Wire Marker Setup” option, and press **ENTER**.

    a. With a tape measure or similar tool, measure the distance from the center of the marking disc to the center of the blades on the Model 970. Highlight the “Wire marker distance to blades” option and press **ENTER**. Using the numeric keypad, enter the measurement and press **ENTER**.

    b. Refer to the manufacturer’s wire marker operating instructions for suggested wire marker print head activation time settings. Highlight the “Marker print time” option and press **ENTER**. Using the numeric keypad, enter the wire marker print head activation time and press **ENTER**.

    c. The lead end mark distance is the distance from the leading end (right end) of the wire to the center of the mark on the wire. Highlight the “Lead end mark distance” option and press **ENTER**. Using the numeric keypad, enter the distance from the lead end of the wire to the center of the first mark and press **ENTER**.

d. The trail end mark distance is the distance from the trailing end (left end) of the wire to the center of the mark on the wire. Highlight the “Trail end mark distance” option and press **ENTER**. Using the numeric keypad, enter the distance from the trail end of the wire to the center of the last mark and press **ENTER**.

e. An operator may program continuous marking along the wire, in addition to end marking. Highlight the “Continuous marking distance” option and press **ENTER**. Using the numeric keypad, enter the spacing desired for all marks between the first and last marks and press **ENTER**. To bypass this option, enter 0.00.

f. To prevent the Model 970 from pulling the wire before the wire is fully released from the print head, it is necessary to program a short release dwell time. Highlight the “Print head release dwell time” option and press **ENTER**. Using the numeric keypad, enter the wire marker print head release dwell time and press **ENTER**.

g. Return to the run screen and activate the **WIRE MARKER ON/OFF** button. Process a small number of sample pieces until the marked wire is indexed through the Model 970.

h. Measure the location of the center of the leading end mark from the leading end of the wire. If the measured dimension is not equal to the programmed leading end mark dimension, highlight the “Measured leading end mark distance” option and press **ENTER**. Using the numeric keypad, enter the distance measured between the lead end of the wire and the center of the first mark and press **ENTER**.

i. Return to the run screen and process a small number of pieces to make sure the measured dimension is equal to the programmed leading end mark dimension.

2. When processing cable in Short Mode, the “Trail end mark distance” and “Continuous marking distance” options will not show in the wire marker setup menu.

Section 11 – Updating the Machine Software/Firmware

When a new machine software or firmware version is available for the Model 970 Compu-Strip®, Carpenter Mfg. Co., Inc. will provide the update to existing Model 970 owners. The software/firmware update will be in the form of a downloadable file sent to customers via email.

The below steps require the use of a correctly formatted USB disk drive. Before performing the below steps, ensure the USB disk drive is empty.

To download and copy the update file onto a USB disk drive, follow the steps outlined below. The below step-by-step procedure is meant to be used as a guide and is just one of the many ways the update file may be copied onto a USB disk drive.

1. Navigate to the email from Carpenter Mfg. Co., Inc. containing the update file. The update file will have the following extension: ".rpd"

2. Right click on the update file, and left click "Copy".

3. Insert the USB disk drive into the computer.

4. Open the file folder containing the USB disk drive and its contents.

5. While in the USB disk drive file folder, right click anywhere, and left click "Paste". The .rpd update file will now be on the USB disk drive.

6. Safely eject the USB disk drive from the computer.

To update the machine software, follow the steps outlined below.

1. If the machine is powered off, turn the Model 970 on. The machine must be powered on and idle (displaying the run screen) to update the software/firmware.

2. Press the **MENU** key and select the "USB Thumb Drive Functions" option and press **ENTER**.

3. Insert the USB disk drive into the USB port.

4. Highlight "Download Software/Firmware Update" and press **ENTER**.

5. Following the instructions on the digital display, press **ENTER** to update the machine software, or press **CLEAR** to cancel.

6. Remove the USB disk drive.

An alternative method to updating the machine software is outlined below.

1. If the machine is powered off, turn the Model 970 on. The machine must be powered on and idle (displaying the run screen) to update the software/firmware.

2. With the Model 970 at the run screen, insert the USB disk drive. The Model 970 will automatically display the “USB Thumb Drive Functions” menu.

3. Highlight “Download Software/Firmware Update” and press **ENTER**.

4. Following the instructions on the digital display, press **ENTER** to update the machine software, or press **CLEAR** to cancel.

5. Remove the USB disk drive.

Section 12 – Maintenance Procedures

Slug Removal

When performing a full strip, the insulation (slug) that is pulled off may cling to the blade area due to static electricity. If this occurs, use of the air blast feature, discussed in-depth on page 45, may be necessary. To remove slugs from the blades and surrounding areas, it is suggested to use a small bristle brush.

Feed Belt/Feed Roller Change or Removal

To change or remove the feed belts/feed rollers, follow the instructions below.

1. Power off the Model 970 and unplug the power cord.

2. Using the feed belt/feed roller pressure adjustment knobs (labeled with "+ LEAD STRIP –" and "+ TRAIL STRIP –" on the machine's face plate), separate the feed belt pairs/feed rollers.

3. Remove the PN 9633 shaft collars with the PN 2934 3/32" hex wrench, and then remove the PN 9632 belt guides. (The PN 9632 belt guides are not used when processing with feed rollers). Once these are removed, remove the worn feed belt pair(s)/feed rollers. These parts are highlighted in Figure 5 below.

4. To install new feed belts/feed rollers, reverse the above steps.

Blade Change

To change or remove the blades, follow the instructions below.

1. Power off the Model 970 and unplug the power cord.

2. Use the PN 8858 9/64" hex wrench to remove (2) PN 3876 screws. The screws are highlighted in Figure 5 below.

3. Remove the blade set and brush clean all components.

4. Install new blade set. Refer to Figure 6 below on how to correctly install the new blades.

5. Replace and tighten (2) PN 3876 screws.

6. Plug the power cord back in and power on the Model 970.

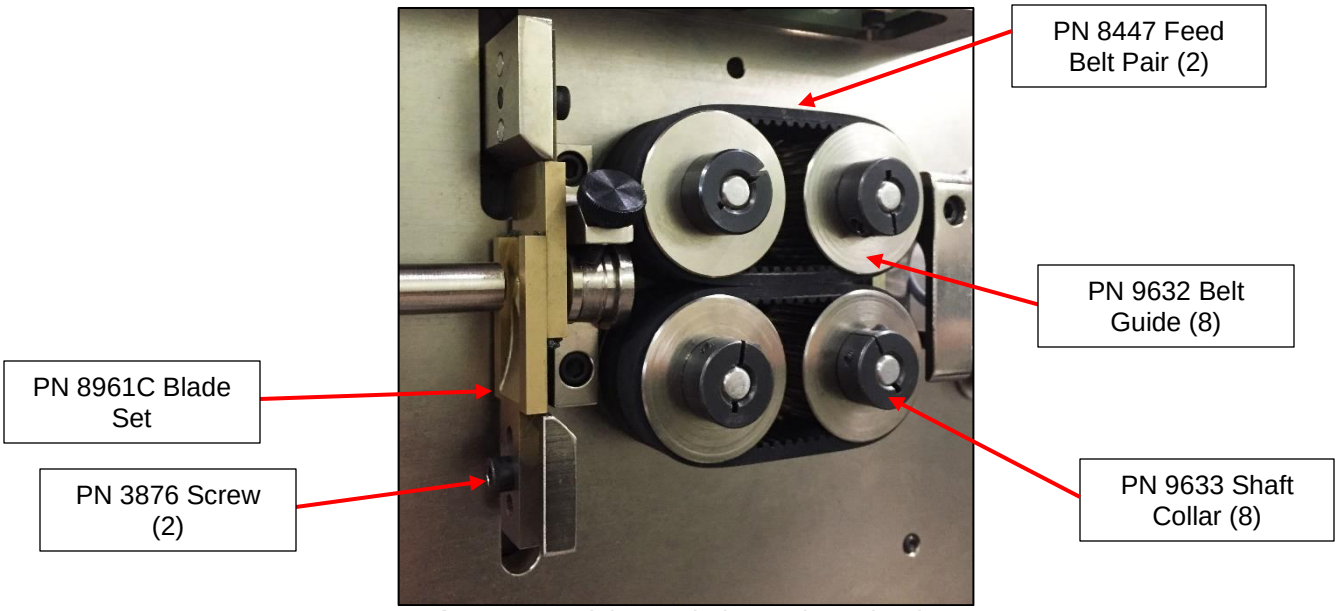


Figure 5: Model 970 Blades and Feed Belts

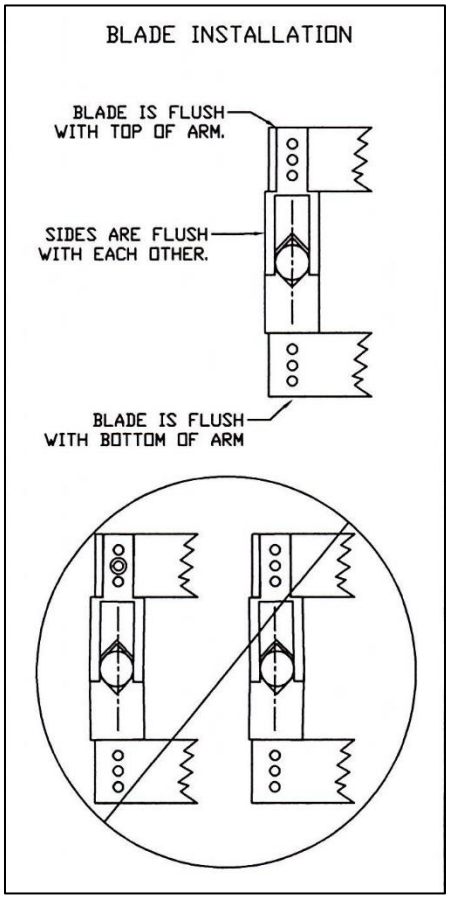


Figure 6: Model 970 Blade Installation Drawing

Section 13 – Recommended Spare Parts

The below items are recommended spare parts for the Model 970 Compu-Strip®.

Quantity per Machine	Carpenter Part Number	Description
2	8447	Feed Belt Pair
1	8961C	HSS “V” Blade Set

Section 14 – Optional Accessories

The below items are optional accessories for the Model 970 Compu-Strip®.

Carpenter Part Number	Description
6662	Heavy Duty HSS “V” Blade Set
8439	Wire Collection Tray Assembly
8553	Carbide “V” Blade Set
8626	Wire Straightener Assembly
8925	Emergency Stop Switch Assembly
8969	Flat Cable Kit
8974	Feed Roller Wire Guide Kit
8988	Wire Stacker Interface Cable
8989	Prefeed Stop Interface Cable
9599	Foot Switch Assembly
9613	Wire Marker Interface Cable
9614	Coiler Interface Cable
9686	Expansion Board Kit (To be used only in conjunction with Carpenter-approved equipment)

Feed Roller Wire Guide Kit

The Model 970 may be equipped with a feed roller wire guide kit for feed roller material transport. The use of feed rollers aids in processing small gauge wire.

Carpenter Part Number	Description
9611	Urethane Feed Rollers
9681	Knurled Feed Rollers

Figure 7 below shows the Model 970 set up for processing with feed belts, before installation of the PN 8974 feed roller wire guide kit.

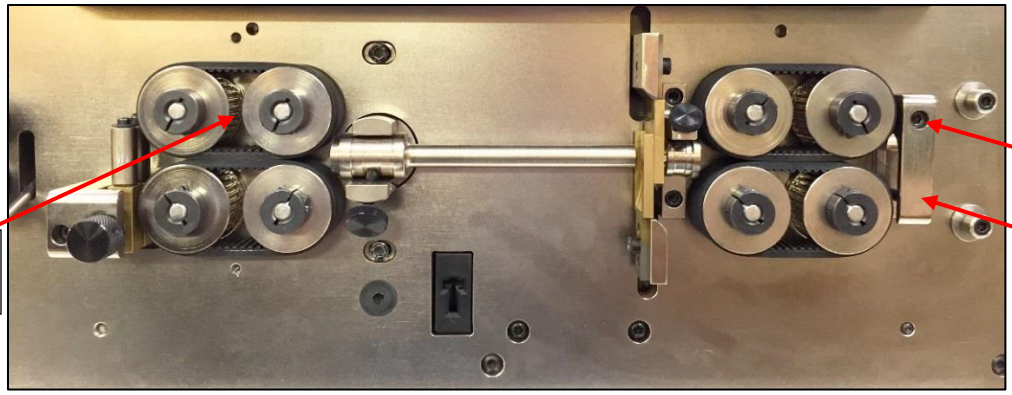


Figure 7: Model 970 Feed Belt Setup

To install the PN 8974 feed roller wire guide kit, first begin by following steps 1–3 for feed belt change or removal. After completing those steps, remove the PN 9609 drive pulleys. (The PN 9632 belt guides are not used when processing with feed rollers). Follow the remaining instructions below.

1. Place the feed rollers on the inside drive hubs.

2. Place the PN 9633 shaft collars on the outside of the feed rollers and tighten.

3. Turn, by hand, the drive hubs on either side of the installed feed rollers to correctly place the PN 9689 input tube mounting block and the PN 9691 exit tube mounting block. The flat portion of each drive hub must be lined up as shown in Figure 8 below to correctly install the two mounting blocks.

4. Remove the PN 8813 output guide by removing the PN 7214 screw. This screw is needed to install the exit tube mounting block.

5. Following Figure 8 below, install the input tube mounting block and the exit tube mounting block.

6. If adjustments to the PN 9688 roller input tube or PN 9690 roller exit tube are needed, loosen the PN 1562 screw and PN 2922 screw, respectively, and adjust as necessary.

7. Press the **MENU** button, highlight the “General Settings” option, and press **ENTER**.

8. Highlight the “Feed Belt/Roller Selection” option and press **ENTER**.

9. Highlight the “Feed Rollers” option and press **ENTER**. The machine is now ready to process material with feed rollers.

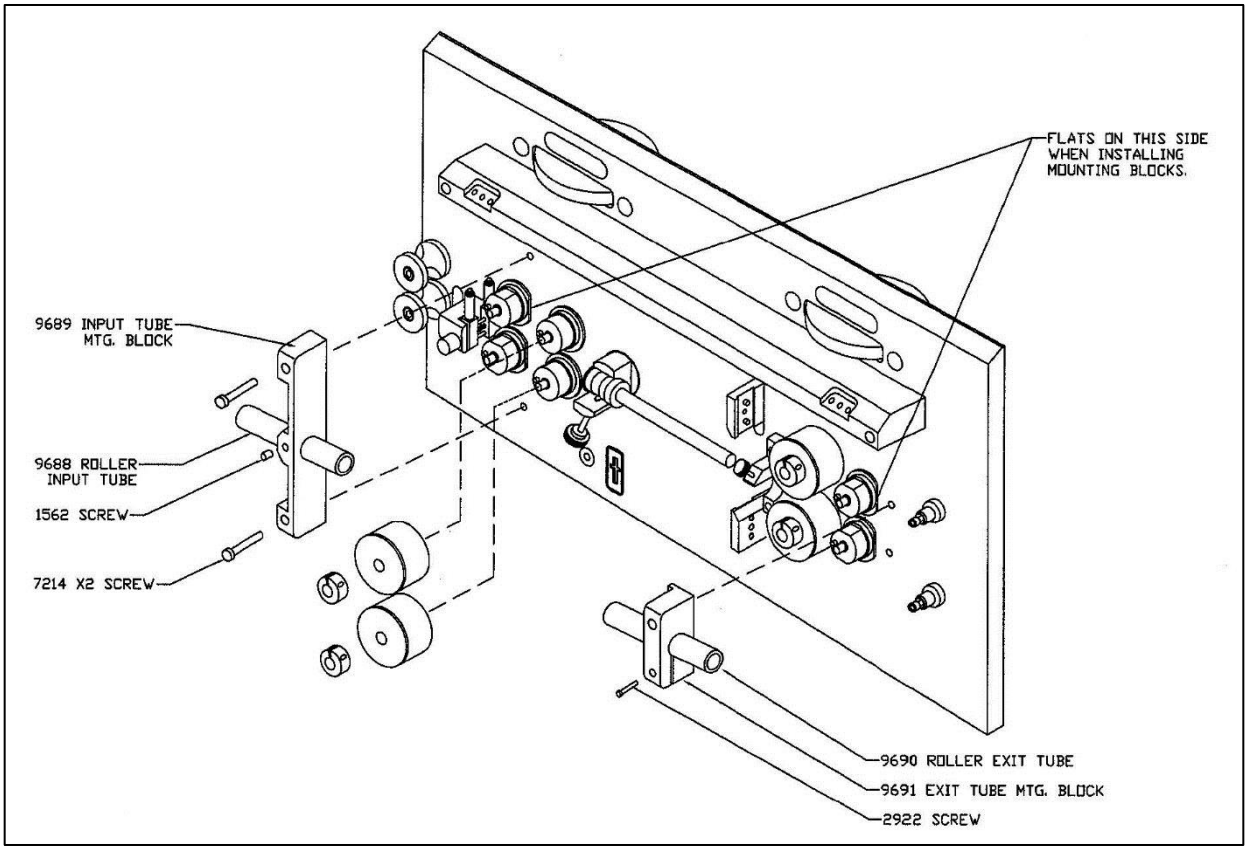
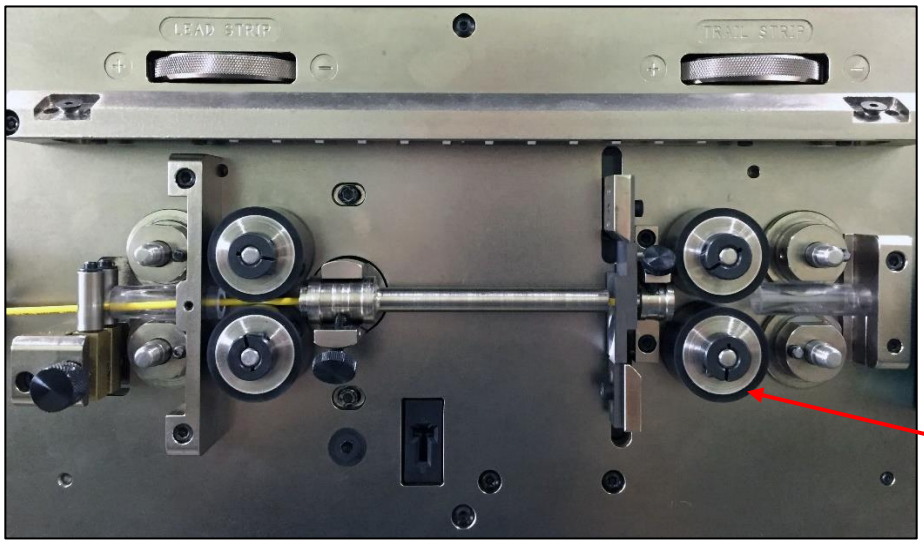


Figure 8: Feed Roller Wire Guide Kit Installation



PN 9611 Urethane Feed Roller (4) [PN 9681 Knurled Feed Roller Also Available]

Figure 9: Model 970 Feed Roller Material Transport Setup

To change or remove the feed rollers, follow the same steps for feed belt change or removal, but do not include the PN 9632 belt guides.

Prefeed Stop Interface (Wire Jam/Overload Protection)

A motorized prefeed may be necessary to assist the Model 970.

The Model 58D Wire Prefeed and Dereeler may interface directly with the Model 970 for wire jam/overload protection. **To interface the Model 970 with Carpenter's Model 58D Wire Prefeed and Dereeler, a PN 8989 prefeed stop interface cable and a PN 9686 expansion board kit must be purchased from Carpenter Mfg. Co., Inc.**

To activate the interface between the Model 970 and the Model 58D, install the interface cable between both units after the expansion board kit is installed. Plug the cable into any one of the (5) auxiliary inputs on the Model 970 expansion board kit.

The prefeed stop interface engages when either the Model 58D bottom accumulator pulley reaches its upper limit and makes contact with the jam sensor switch assembly, or when the prefeed overload protection activates.

The Model 58D will send a signal to the Model 970 indicating there is either a wire jam or overload condition. When the Model 970 receives this signal, the machine will immediately stop processing. (If a Model 80 Single Bowl Wire & Cable Coiler is interfaced with the Model 970, this machine will also stop).

If either a wire jam or overload condition is detected, the Model 970 will show an error on the digital display. Follow the instructions on the digital display to remove the wire jam/overload condition from the machines.

The prefeed stop interface (wire jam/overload protection) is compatible only with the Model 58D Wire Prefeed and Dereeler.

Foot Switch Assembly

The Model 970 may be equipped with a foot switch assembly for use when processing material. The assembly also interfaces with the Carpenter Model 80 Single Bowl Wire & Cable Coiler.

When the machine is programmed to the correct settings for material processing, activate the foot switch assembly by pressing the **FOOT SWITCH** button in the "Process Control" section of the keypad. When ready to process, simply press the **RUN** button and follow the instructions on the digital display.

If a program is saved with the foot switch option turned on, the foot switch option will automatically turn on (if it was previously turned off) when that program is recalled from memory. Similarly, if a program is saved with the foot switch option turned off, the foot switch option will automatically turn off (if it was previously turned on) when that program is recalled from memory.

Expansion Board Kit

The Model 970 may be equipped with an expansion board kit to work in conjunction with a Carpenter Model 80 Single Bowl Wire & Cable Coiler, a Carpenter Model 58D Wire Prefeed & Dereeler (for wire jam/overload protection), a wire stacker, or a wire marker. To interface the Model 970 with any of the above controls, an expansion board kit must be purchased from Carpenter Mfg. Co., Inc. The expansion board kit is to be used only in conjunction with Carpenter-approved equipment.

Instructions on how to correctly install the expansion board kit are provided below.

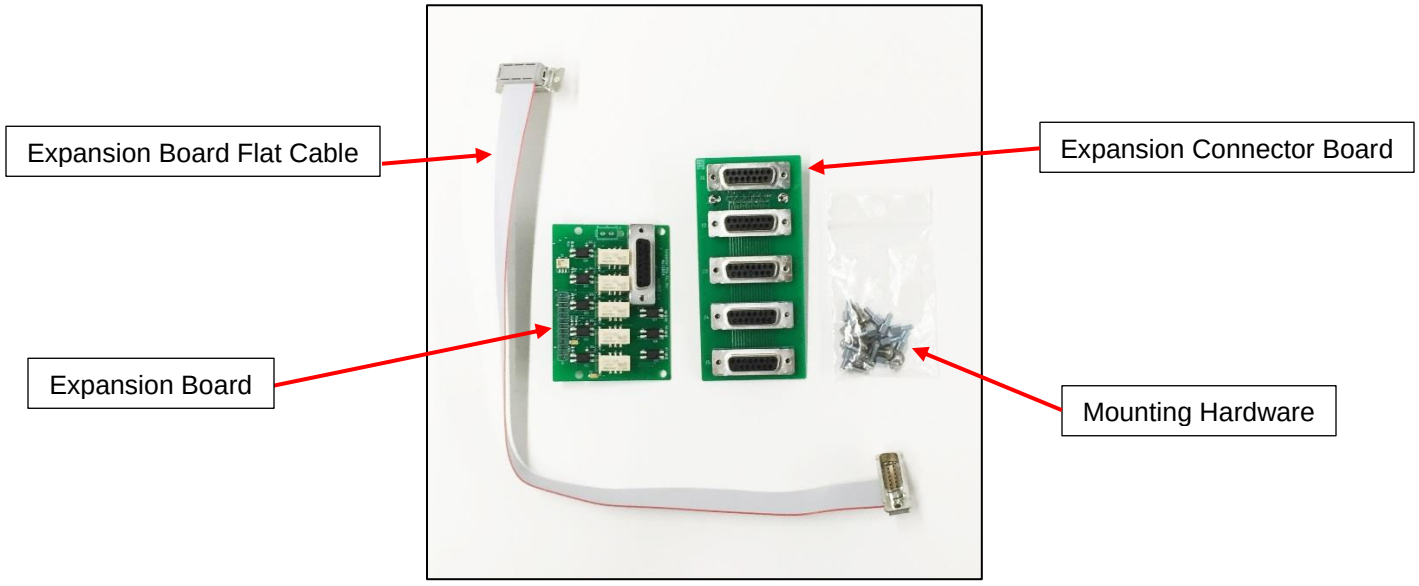


Figure 10: Expansion Board Kit Contents

1. Remove the (6) PN 3948 cap screws (and washers) from the machine back cover and remove the cover. Refer to Figure 11 below.

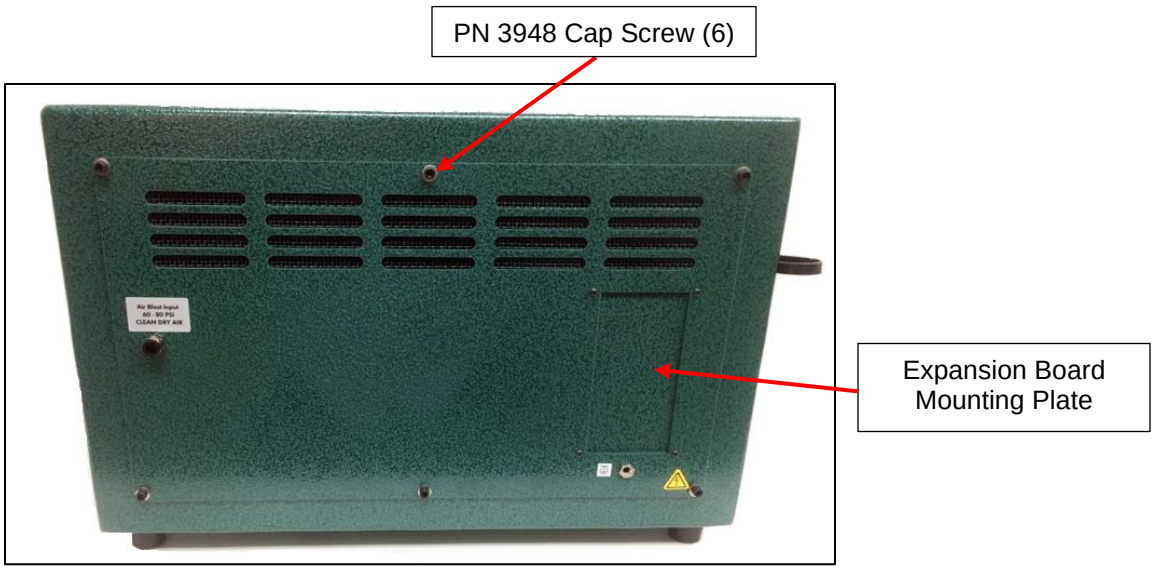


Figure 11: Model 970 Back Cover (Pre-Expansion Board Kit)

2. Carefully unplug all wire leads from the control board on the back side of the front panel.

3. Remove the (8) PN 5060 flat head screws from the top of the cabinet and carefully remove the front panel assembly from the machine. Refer to Figure 12 below.

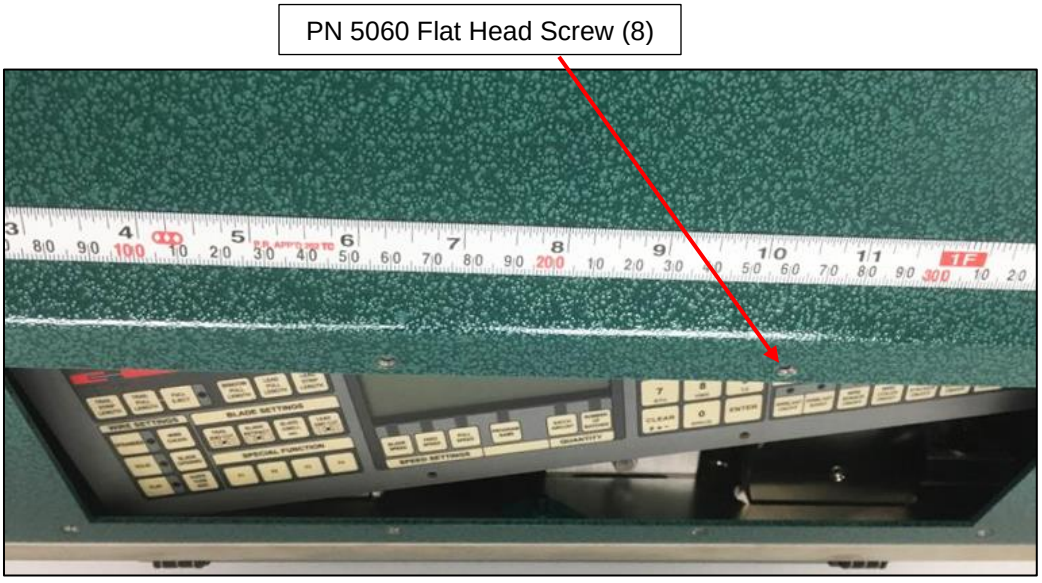


Figure 12: Removing the Model 970 Front Panel

4. Locate the expansion board mounting position on the machine front panel. Mount and secure the expansion board, highlighted in Figure 10 above, to the machine front panel with the supplied mounting hardware. Refer to Figure 13 and Figure 14 below.

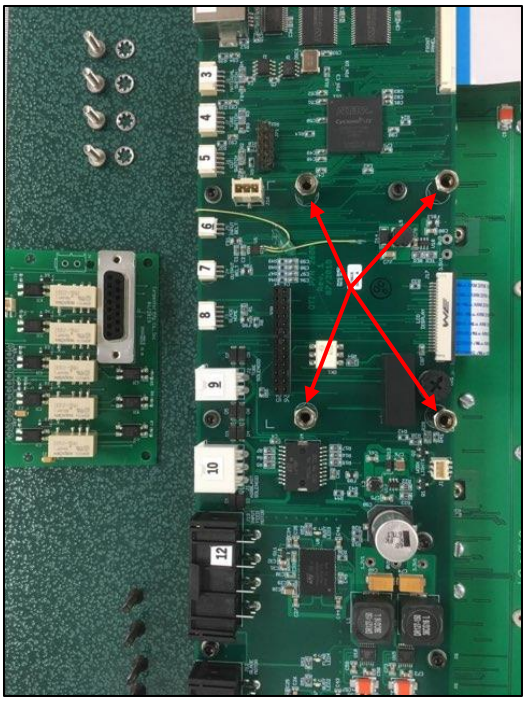


Figure 13: Expansion Board Mounting Position

Figure 14: Expansion Board Mounted to the Front Panel

5. Secure the expansion board flat cable to the expansion board with the supplied mounting hardware. Refer to Figure 15 below.

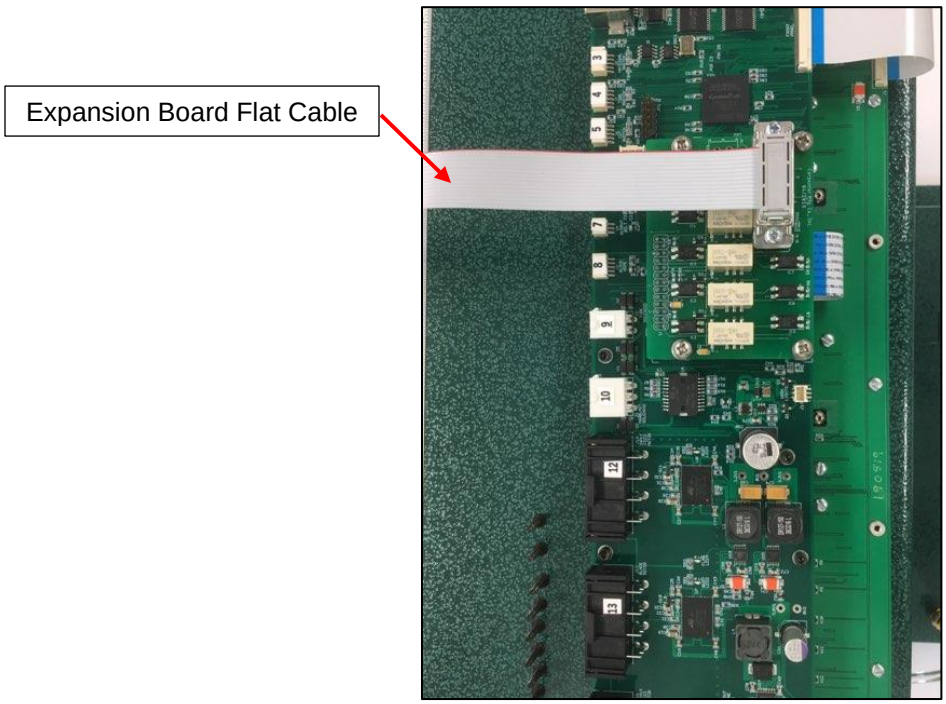


Figure 15: Flat Cable Mounted to the Expansion Board

6. Reinstall the machine front panel and carefully reconnect all numbered sensor/motor heads to the machine front panel. Refer to Figure 16 below.

Figure 16: Reinstalling the Front Panel

7. Remove the expansion board mounting plate from the machine back cover. Mount the expansion connector board to the expansion board mounting plate with the supplied mounting hardware. Refer to Figure 17 below.

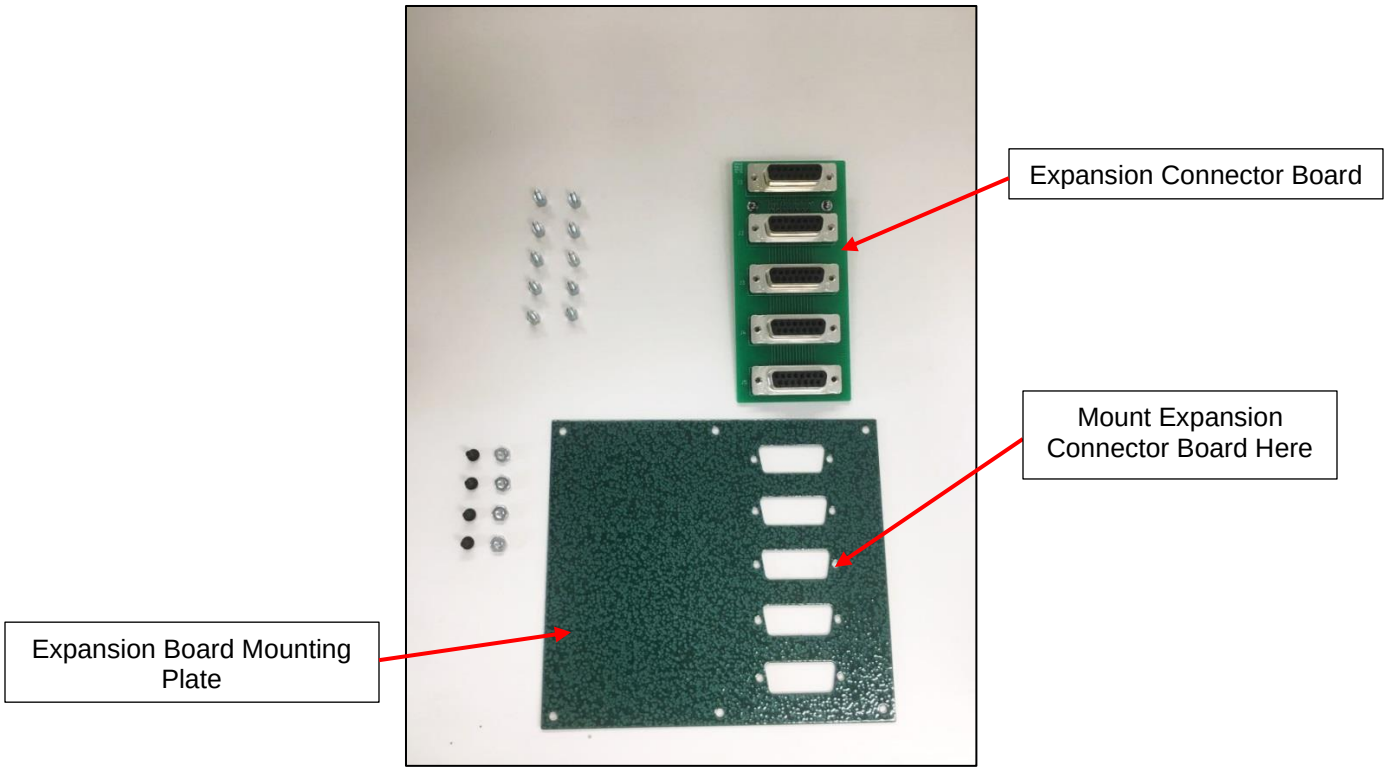


Figure 17: Expansion Board Connector and Expansion Board Mounting Plate

8. Refasten the expansion board mounting plate to the machine back cover. Once complete, fasten the expansion board flat cable to the expansion connector board with the supplied mounting hardware. Refer to Figure 18 below.

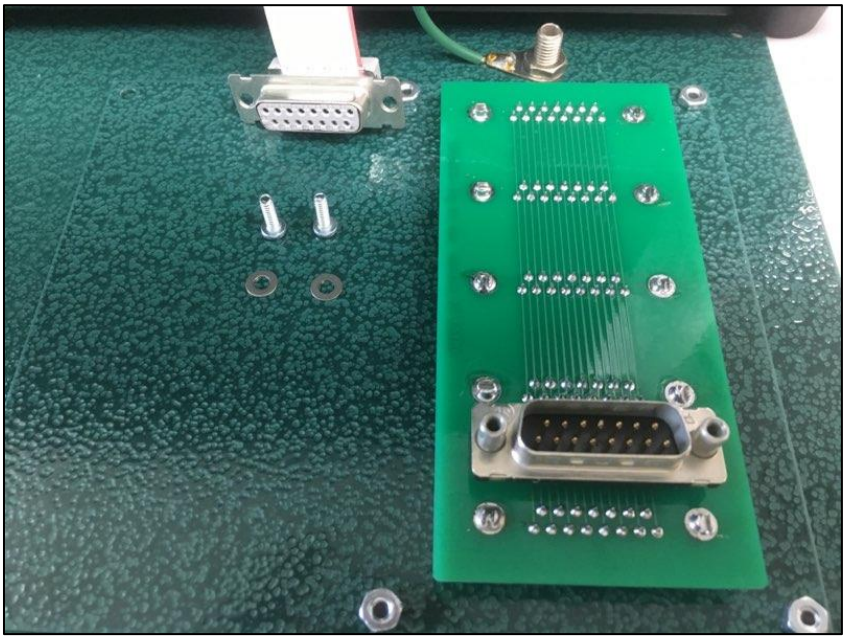


Figure 18: Plugging the Expansion Board Flat Cable into the Expansion Connector Board

Reference Figure 19 below to view the expansion board kit completely assembled into the Model 970.

Figure 19: Expansion Board Kit Assembled

Section 15 – Important Elements for Trouble-Free Operation

For trouble-free operation, follow the guidelines below.

1. The unit must be plugged into a proper electrical outlet, and the machine must be turned on.

2. If using an optional wire straightener assembly, the assembly must be adjusted properly.

3. The feed belt/feed roller pressures must be adjusted properly for the current application.

4. The correct input guide tube and exit guide must be used for the current application.

5. The data entered into the fields must be correct and accurate.

6. Use of a motorized prefeed may be required for certain applications.

Common processing issues and lists of checks for each issue are listed below.

Common Problem	List of Checks
Length Inaccuracies	1. Check the feed speed 2. Check the feed belt/feed roller pressures 3. Verify the wire length setting 4. Check for proper adjustment on wire straightener assembly (when applicable) 5. Check for proper adjustment on centering roller guides 6. A motorized prefeed may be required

Common Problem	List of Checks
Wire Jams	1. Check for proper input guide tube and exit guide usage 2. Check for slugs stuck in the exit guide 3. The air blast feature may be necessary; check for proper PSI 4. Check the feed belt/feed roller pressures (setting may be too high) 5. Check the feed speed 6. Check for possible wire splice 7. Check for foreign material or debris 8. For large gauge wire, the exit guide may need to be removed 9. Check the trail end cut and lead end cut settings

Common Problem	List of Checks
Nicks, Scrapes, or Cut Conductors	1. Check the condition of the blades 2. For nicks on the processed wire, check the trail end cut and lead end cut settings 3. For scraping on the processed wire, check the blade retract setting

Common Problem	List of Checks
Stripped Insulation Not Pulling	1. Check the trail end cut and lead end cut settings 2. Check the blade retract setting 3. Check the pull speed 4. Check the feed belt/feed roller pressures

Section 16 – Warranty

Carpenter Mfg. Co., Inc. manufactures its products to be free from defects in materials and workmanship. Should any defect occur within 1 year after shipment, Carpenter Mfg. Co. Inc. will, at its option, exchange or repair the defective device.

At the discretion of Carpenter Mfg. Co., Inc., repairs or adjustments to equipment under warranty can be performed at our factory or at the customer location. In most cases a 1- or 2-day turnaround time will be necessary to repair equipment at our facility. When equipment is returned to our factory for repair or replacement, freight charges will be borne by the customer. Repaired or replaced equipment will be returned at Carpenter's expense via UPS Ground. If alternate shipping is requested by the customer, the difference in shipping charges will be billed to the customer.

This is a limited warranty and is in lieu of all other representations and expressed and implied warranties (including the implied warranties of merchantability and fitness for use). Under no circumstances shall Carpenter Mfg. Co., Inc. be liable for any incidental or consequential property damages or losses subsequent to misuse or improper maintenance of this equipment.

The following are not covered by the latter warranty:

- Consumable parts (blades, belts, guides, springs, inserts, stripping wheels, etc.)
- Cosmetic problems (nicks, scratches, etc.)
- Damages caused by any repairs or modifications by unauthorized personnel
- Abuse
- Damages caused by shipping
- Damages caused by environmental and/or atmospheric conditions
- Damages caused by the use of contaminated compressed air