



# MAC Modular Feed Systems

Models 63/1063/2063

## MAC Feed Systems

- ✓ **Efficient, Economic Modular Design**
- ✓ **Meets a Wide Range of Test Applications**
- ✓ **Precision Manufactured for Quick Assembly**
- ✓ **Handles Bars, Tubes, and Billets**
- ✓ **Diameters from 1/8" to 7 1/2"**
- ✓ **AMFT/PLC Controllers**



Outlet conveyor with accept/reject receiving pockets on either side for sorting. Feed racks are in the upper left. Test equipment will be installed between outlet conveyor and incoming Feed Racks. and Channel Roll Sections

## DESCRIPTION

MAC's modular design Feed Systems provide mechanical handling of bars and tubing as they enter and leave a test station.

Designed to withstand the hard use of production environments, while still being economical, they are easy to install and readily adaptable to changing needs.

The modular design permits quick assembly into many configurations to handle various lengths of material, and allows for later additions or changes. Both round and hexagonal material can be accommodated.

A completely automated operation can be supplied, feeding the material from the incoming

racks to the channel roll sections, through the tester, out to the run-out channels, with delivery to the appropriate accept or reject pockets.

All rolls in the channel sections are generally belt or chain driven, utilizing one or more AC frequency controlled motors and a central controller.

Controls include an automatic/manual feed and throw-off control box (AMFT) and a programmable logic controller (PLC) to regulate and monitor the entire system.

There are 3 basic models: 63, 1063, & 2063. Complete layout drawings are supplied for the customer's approval prior to manufacture. Flat roll feed systems (model 203) can also be supplied, for special applications.

## SYSTEM COMPONENTS

### **Feed Racks**

MAC feed racks consist of a series of welded steel sections braced to accept a standard bundle of material. The racks are usually topped with a 3/4" strip of Herculon®, ultra high molecular weight polyethylene to provide long wear and prevent marking.



Eight foot wide sloping feed rack composed of six foot sections. Racks are topped with Herculon® strip.

## System Components *(continued)*

### **Intermediate Stop Arms**

Stop Arms can be installed part way up the feed rack to hold back part of the material, or allow bundles to be broken. The arm is placed in the full "up" position



*Intermediate Stop Arms hold back bars from a bundle that has just been broken out onto the Feed Rack in a bar mill.*

when a bundle of material is placed on the Feed Rack. They are then lowered gradually (controlled by an electrically operated air valve) to allow a limited number of bars or tubes to spread out on the Feed Racks.



*Stop arm (above) on an incoming feed rack can hold back bundles or individual tube, bar, and billets based on the application.*

### **Pneumatic Release Mechanisms**

The bars or tubes slide down the feed rack and the release mechanism holds them back and releases them one piece at a time onto the Channel Roll Sections.



*Release Mechanism releasing a bar to the Channel Roll Section*

### **Channel Roll Sections**

Six foot long (1.89m) Channel Roll sections, each with a series of 120° "V" rolls, provide the basic unit for feeding the material to and from the tester. Each roll is individually adjustable for vertical and horizontal displacement to allow exact alignment of all the rolls with respect to each other.

Rolls are available in urethane, steel, or hardened steel, depending on the application. Rolls are belt or chain driven, and protective covers are included.



*Channel Roll Sections*

The Channel Roll sections interlock to form a continuous table, supported by Base Units installed at the point of interlock and affixed to the floor. A minimum of two channel roll sections are needed for the input and two for the output. The design ensures more than adequate load bearing capacity and rigidity for the application.

### **Easy Drop Release**

The "Easy-Drop" attachments are mounted between rolls in the incoming channel sections. Separate controls are used to gently move the bar or other material from the Feed Rack onto the V rolls in the Channel Sections. This prevents undue wear and misalignment of the rolls when

heavy material is being handled. The mechanism consists of a padded V section which catches the bar when initially released, and then folds downward to place the bar on the moving V rolls.

### **Throw-Off Attachments**

Throw -Off attachments may be mounted between any two rolls in a Channel Roll section. They consist of two cone-shaped rollers, which are activated independently to throw material in the correct direction. The number of Throw-Off attachments used depends on the length of the material being handled. The Throw-Offs are activated by air cylinders which are controlled by the AMFT or PLC which receives signals from the tester's automatic controls.

### **Transfer Arms**

Transfer arms are used where receiving pockets can only be positioned on one side of the line. They lift to permit material to be dropped in the accept/reject pocket, when called for by the instrumentation.

### **Receiving Pockets**

Receiving Pockets are used to accept material ejected from the exit Channel Roll Sections. They are made of welded steel channel and can be provided with or without "easy down" hardware to reduce the noise and impact when material is dropped into an empty or partially filled pocket.



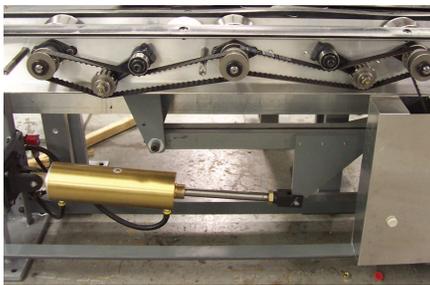
*Easy Down hardware*

## Easy Down Hardware

The Easy Down Hardware consists of high strength nylon straps attached to heavy duty springs. The springs are available in three tension strengths to match the anticipated load in the pocket.

## Motor Assemblies

Controlled belt or chain drive motor assemblies are utilized to provide drive power to the Channel Roll Sections. Belt drives are the preferred drive as they are generally quieter and require less maintenance than chain drives. The number and horsepower of the motors is determined by the weight and length of the material being driven.

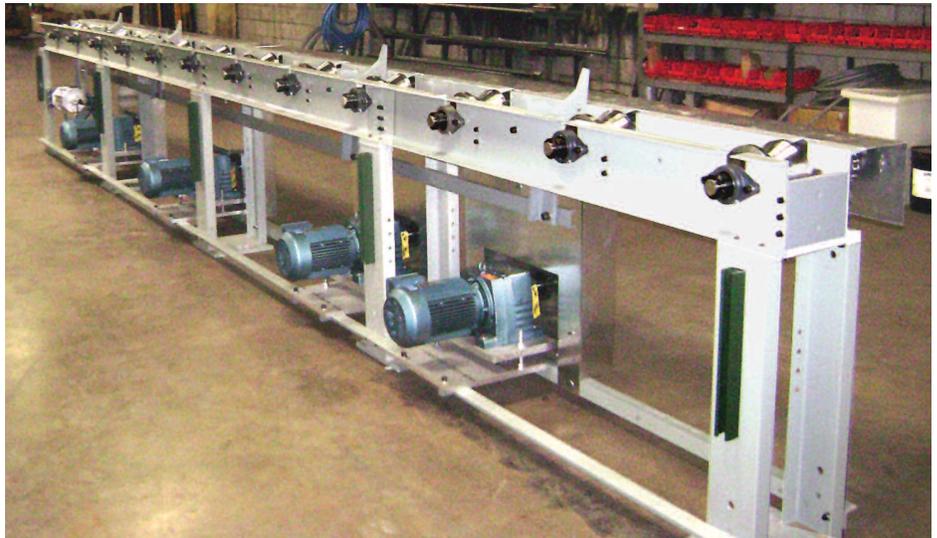


Channel Section with Belt Drive

Motor Assemblies are packaged combinations of motor(s), gear reducer(s), an A/C Frequency Controller to adjust speed, push-button forward/off/reverse switch, main disconnect switch, and suitable tensioners and guards.

Motor Assemblies usually include up to four motors, rated 1, 2, 3, or 5HP, with two speed ranges, providing test speeds up to about 250 fpm in the low range, and up to about 600 fpm in the high range. Speed can be varied in all motors simultaneously over an approximate range of 8: 1.

Electrical service must be 3 phase, 460 Volts. Motor Assemblies for other input power are available, at a small additional cost, if specified at time of order. Drawings are available upon request.



Incoming Channel Roll Section for a Model 2063 Feed System, designed to handle material from 1" - 7 1/2" diameter in a stainless steel bar mill in Kentucky. The Feed System is part of a production line that includes an Echomac® ultrasonic rotary tester on dual Pinch Stands with FD-4 electronics and an AMFT Programmable Controller.

## AMFT/ PLC Programmable Controller

The Automatic/Manual Feed and Throw-Off programmable controller (AMFT) provides automatic, or automatic/manual, operation of the feed system. In the manual mode, the AMFT provides for push button release of the bar or tube from the Feed Rack to the Channel Roll section, and throw-off in either direction.

In the automatic mode, the AMFT sensors or switches determine when material is in the tester and maintain the release mechanisms and throw-off rolls in the "down" position. When the material leaves the tester, the appropriate set of throw-off rolls and release mechanisms are raised to direct the piece into the correct receiving pocket, and to release the next piece onto the incoming Channel Roll section. As the next piece enters the tester, the release mechanism resets and the "throw-off" rolls return to the "down" position.

Test data is used to preset appropriate inputs and outputs to the AMFT so that the correct set of

"throw-off" rolls are raised.

The Programmable Logic Controller (PLC) is designed for multiple inputs and output arrangements, extended temperature ranges, immunity to electrical noise, and resistance to vibration and impact.

## Conductor Control System

The Conductor Control System is an independent computer with interfaces and software to allow the control of multiple test instruments and pinches and to interface between the test line and plant network.

When used to control a test bench, all parameters can be set, stored, and when a new dimension/test is at hand, the computer loads all information to the test electronics, changes all mechanical settings and electronics testing parameters automatically. Only adjustment of sensors must be done manually.

The computer is simple with logical menu structures. If an AMFT/ PLC is being used to control mechanics it too can be given instructions through the Conductor computer.



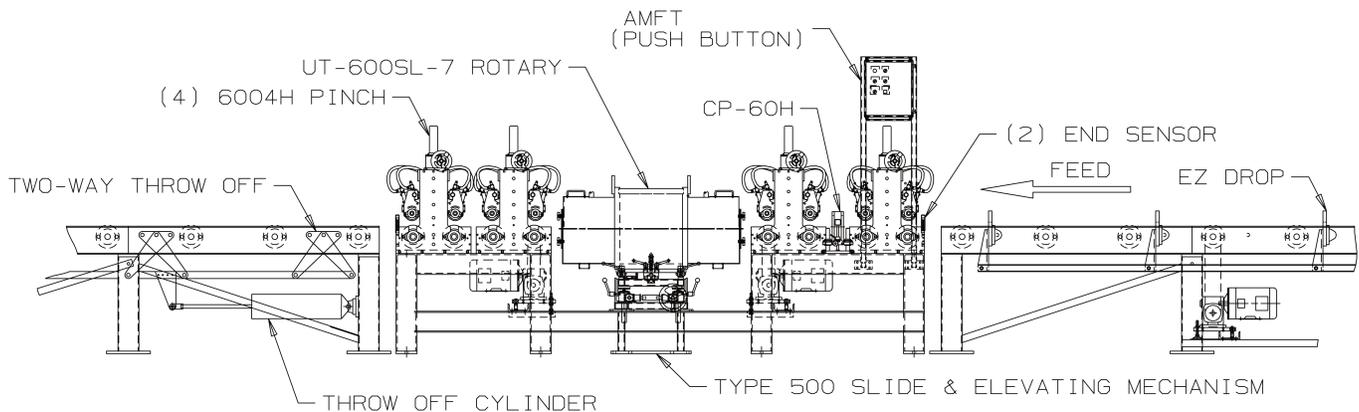
Exit channels and receiving pockets for a large feed system installed in a tube mill in China. Since both accept and reject pockets are located on the same side of the line, transfer arms are used. They are shown in the "down" position. Easy Down straps can be seen in the receiving pockets.

### Feed System Specifications

Model #	63	1063	2063
Size Range of Material (1)	1/8" - 1 - 1/2" (3.175mm - 38.1mm)	3/4" - 3 - 1/2" (19.05mm - 88.9mm)	1.0" - 7 1/2" (25.4mm - 190.5mm)
Channel	4" (101.6mm) wide, Aluminum	6" (152.4mm) wide, Aluminum	8" (203.2mm) wide, Steel
Roll Size	4 1/16" dia. x 1 1/4" wide (105mm x 31mm)	5 1/8" dia x 3 1/8" wide (129mm x 79mm) -or- 5 3/8" dia x 3" wide (137mm x 76mm)	6 5/8" dia x 5" wide (168mm x 127mm)
Roll Material	Urethane, Steel, or Hardened Steel	Urethane, Steel, or Hardened Steel	Urethane, Steel, or Hardened Steel
Channel Sections	6' Long (1.8m)	6' Long (1.8m)	6' Long (1.8m)
Rolls Per Section	3-6	2-4	3
Standard Height (2) (Base & channel from floor to apex of roll)	33 3/64" (839.39mm)	35 3/4" (908.05mm)	35 3/4" (908.05mm)
Feed Tables	4' 6" or 8' (1.2m, 1.8m, 2.4m) Flat or Sloping	4' 6" or 8' (1.2m, 1.8m, 2.4m) Flat or Sloping	4' 6" or 8' (1.2m, 1.8m, 2.4m) Flat or Sloping

**Notes:**

- (1) When determining the Model to select, the weight and finish of the material being handled as well as the diameter must be taken into consideration. For example, hot rolled 3 1/2" (89.9mm) diameter steel bars would probably require the 2063 Model rather than the 1063.
- (2) The supporting bases can be designed to a different height to meet the customer's specifications.
- (3) All quotations include a complete engineering drawing of the proposed Feed System.



The drawing above shows MAC's easy drop feature and feed, dual pinch roll stands, an Echomac® ultrasonic rotary, and a two way throw off, all controlled by the AMFT.



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