

Product Overview

Column & Boom Manipulator

AMET is pleased to provide the following product introduction on our standard models of column and boom manipulators. These manipulators are designed to move a weld head over a weld joint. The models we produced cover various ranges, from 4 x 4 ft to 23 ft x 23 ft (1.2 x 1.2 to 7 x 7 meters), in order to meet your application requirements. We offer manipulators in five standard versions.

Four versions are based on weight carrying capacity on the boom. We have a light duty, standard duty, heavy duty and extra heavy duty product range. Each range has different weight and stroke ranges. The fifth version is our "fixed" boom where the boom is fixed to the saddle and we use a boom carriage to move the weld head along the length of the boom.

Our booms are designed for linear welding. Each boom, as standard, is designed with a variable speed drive suited for typical GMAW, FCAW and SAW welding applications. On GTAW and PAW projects, we do suggest the customer upgrade to our servo driven package. (The upgrade includes a servo motor with encoder, servo motor drive and precision gear box.)

For special projects, AMET can upgrade each axis of the CBM motion to be a precision, robotic grade welding axis. We upgrade the boom drive to an extra precision helical gear rack, pinion gear, precision gear box, driven by a servomotor with encoder feedback. On the column, we use a ball screw drive and servomotor with encoder feedback. On the travel car, we use a servomotor with encoder feedback, driving a precision pinion gear which engages a precision gear rack, mounted to a machined base assembly fitted with linear rails. AMET will also consider your special requests for column and boom manipulators and features as well.

Purpose:

Standard column and boom manipulators are typically used to locate a weld head to a desired position for welding in a stable and secure manner. Once in position, the part is moved during welding to produce high quality welds. A manipulator can be used on a wide variety of parts and part shapes and offers the customer excellent flexibility. Welding is performed using GTAW, PAW, GMAW, FCAW, SAW or YAG Laser.

In most GMAW, SAW and FCAW welding, the standard boom can be used as a linear welding axis, as these weld processes may not require precise welding motion. We strongly recommend upgrading the boom motion to the precision boom drive option if precise linear welding is desired, for example GTAW, PAW and Laser welding.

Benefits:

The standard column and boom manipulator has several benefits over welding the part manually, including:

- Able to achieve consistent weld results
- Able to maintain weld head over weld joint in a stable position during the weld
- Increases arc-on time and overall productivity
- Provides ability to have multi-weld stations using only one weld head, increasing your return on investment
- Reduced operator fatigue
- Reduced consumable costs
- Ability to have two welding process at one welding station by using both ends of the boom

These benefits greatly reduce the time to prepare a part for welding and the time to finish a part after welding.



Also, rework time will be reduced and part scrap will be cut. AMET can include optional features, such as travel carts, machined base rails and precision linear boom travel, to complete our standard CBM models.

CBM-HD-7x4.5 with XM controlled Lincoln Tandem SAW
Babcock Wilcox Canada

Capacities:

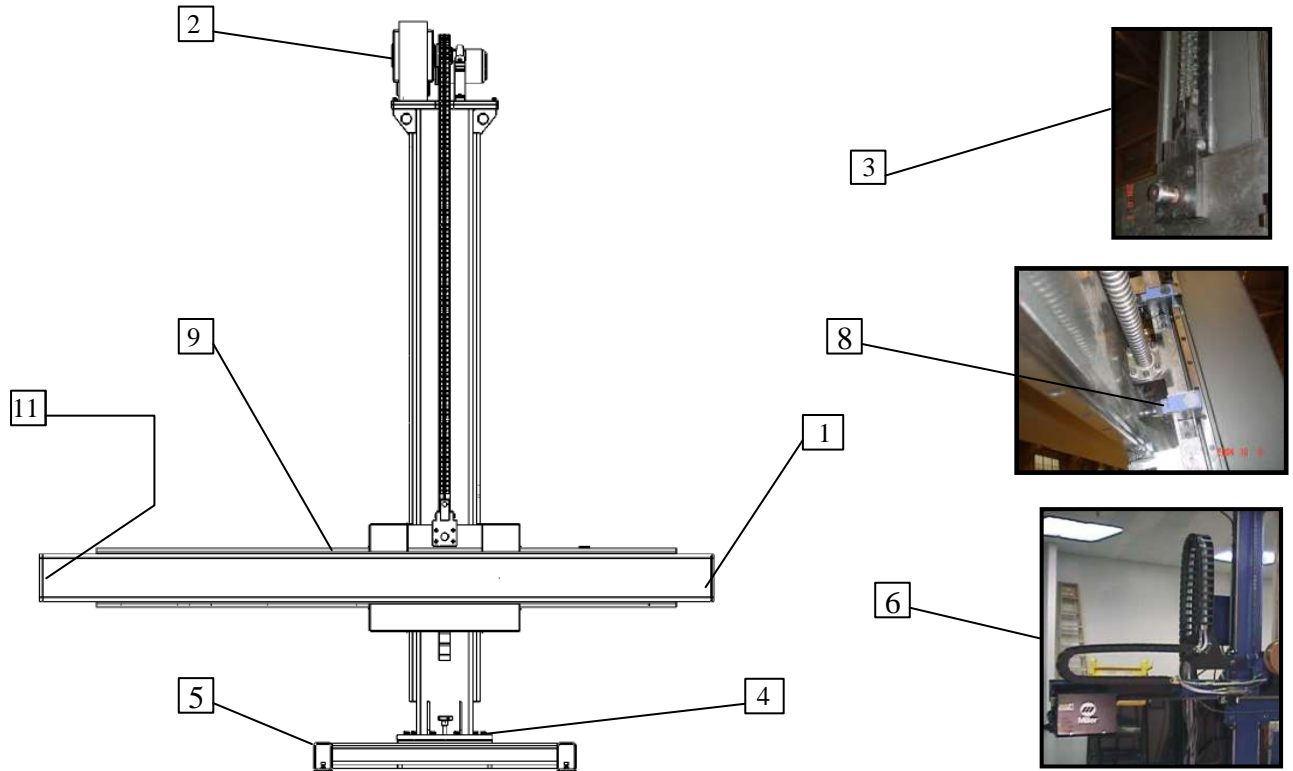
As standard, AMET can produce column and boom manipulators with a wide capacity range from 1200 to 7000 mm (4 ft to 23 ft) strokes. We will increase to a maximum of 7500 mm (24.5 ft) with reduced weight capacities.

All standard column and boom manipulators have the following general capacities and specifications:

- Boom Weight capacity: See Chart on next page
- Boom drive: Gear rack and pinion drive
- Boom motor: AC Motor, adjustable speed
- Column Lift mechanism: Chain drive and gear box
- Column drive motor: AC Motor, fixed speed
- Free Standing, Rotating base: allows 360 degrees of column rotation
- Safety Device to stop boom if chain should fail
- Cable carriers for proper cable management

Product Overview

STANDARD FEATURES on CBM - Standard Manipulators



1. Motorized horizontal boom travel, rack and pinion gear drive. Adjustable speed, 100 to 2000 mm/min. (4 to 80 IPM) using AC Motor. (Precision drive uses Servo motor with encoder feedback, speed range is 1 to 80 IPM / 25 to 2000 mm/min)
2. Motorized boom lift travel, double or triple chain drive. Fixed speed using AC motor, approx. 1000 mm/min. (40 IPM)
3. Safety Device – anti-fall device in case the chain or pin assembly should fail
4. Rotational Base assembly – allows column to be rotated 360 degrees. Includes locking brake.
With travel car option, includes manual gearing to rotate column.
5. Free Standing base assembly
6. Cable Carriers for proper cable management on the boom and column.
7. Pendant Control – Includes buttons for operator to control up/down and in/out position of manipulator and adjust boom speed
8. Travel Extent Limit Switches included to prevent over-travel.
9. Hardened Heavy-duty linear rails on boom and column to insure smooth travel in both axis.

Horizontal boom travel acceptable for some GMAW, FCAW and SAW applications.

10. Boom and Column are stress relieved and machined to insure smooth and accurate travel motion
11. Designed to hold rated load of total weight on boom, on either end.

NOTE: AMET manipulators are NOT designed as personnel carriers. A seat or operator platform should never be added to the boom, nor should a person ever ride on the boom.



XM Controlled GTAW welding

CBM-F-3x3

Fixed Boom Manipulator

Combined with Seamer table top and weld lathe

Product Overview

Standard Product Range of Column & Boom Manipulators

Stroke (Metric)	Stroke (SAE) *	"Light Duty" (Service 1)	Standard (Service 2)	Heavy-Duty (Service 3)	Extra Heavy-Duty (Service 4)	Fixed Boom (Service 5)
		CBML	CBM	CBMH	CBMX	CBMF
Weight Cap.	Weight Cap. **	Weight Cap.	Weight Cap. **	Weight Cap. **	Weight Cap. **	Weight Cap. ***
1.2 x 1.2	4 ft x 4 ft	225 kg / 500 lbs				
2 x 2	6.5 ft x 6.5 ft	225 kg / 500 lbs	500 kg / 1100 lbs			150 kg / 330 lbs
2.5 x 2.5	8 ft x 8 ft	180 kg / 400 lbs	(500 kg / 1100 lbs)			150 kg / 330 lbs
3 x 3	10 ft x 10 ft	150 kg / 330 lbs	415 kg / 900 lbs	700 kg / 1500 lbs		150 kg / 330 lbs
4 x 4	13 ft x 13 ft		310 kg / 685 lbs	525 kg / 1150 lbs	1000 kg / 2200 lbs	150 kg / 330 lbs
5 x 5	16.5 ft x 16.5 ft		250 kg / 550 lbs	420 kg / 900 lbs	1000 kg / 2200 lbs	
6 x 6	19.5 ft x 19.5 ft			350 kg / 770 lbs	875 kg / 1900 lbs	
7 x 7	23 ft x 23 ft			300 kg / 660 lbs	750 kg / 1650 lbs	

Standard Stroke Offering:

On CBM, CBMH, CBMX, you can increase boom or column strokes by 0.5 meter (20"). Thus, the absolute largest CBM AMET can make is 7.5 by 7.5 M (24.5 ft x 24.5 ft)

* AMET will manufacture boom and column strokes to insure they meet the SAE strokes stated

** For SAW applications, contact AMET for possible flux equipment allowances

*** Weight capacity is based on Boom Carriage Capacity

Note: The Boom Drive on each model can be upgrade with Precision Drive, using AC Servo Motor, Amplifier and better gear box drive

Note: AMET can make special manipulators to meet special requirements. Please contact factory with your project details.
For Example:

1. Tower Tech - CBMX, but also fitted with two boom carriages
2. FMC - Precision/Robotic grade X-Y-Z manipulator with travel cart



CBMF-2.5 x 3 Precision CNC Manipulator – FMC



CBML-3 x 3 Manipulator ERC



CBM-2x2.5 Manipulator with two weld processes

Product Overview

Typical Applications for a CBM Column & Boom Manipulator

Large Dry Storage Tanks

These large storage tanks are typically welded using the SAW process. The tank is placed on turning rolls and CBM holds the weld head in position as the tank rotates beneath it.



Chemical Tanks

These tanks are typically made of stainless steel, aluminum or other special alloys and welded using various weld processes.



Fuel Tanks

Fuel storage containers, including large LPG tanks and propane tanks.



Boiler Industry

Typically used for high pressure vessels and condensers.



Bore Cladding

Internal cladding on valves and pipe used in the petrol-chemical industry.



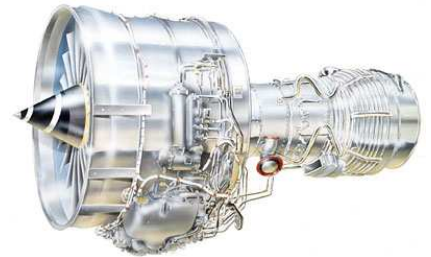
Tanker Truck & Rail Trailers

Stainless and Aluminum tanks associated with truck hauling and trailers.



Aero-engine

Components used on jet engines (and other areas on aircraft), using the Dabber type GTAW process



Aerospace

Large fuel cells used in launch vehicles.



Pipe Manufacturing Industry

Used to weld flange and fittings to pipe sections.



Product Overview

CBM Manipulator Optional Features

QII System Control

Allows operator to control 4 welding parameters at one time with one weld program, including the weld sequence. See QII Literature for details.



Precision Linear Boom Drive

Upgrade the linear boom travel mechanism for precision linear welding applications. Upgrade includes servo motor for boom drive, with encoder feedback. Servo motor drive amplifier is used. Precision gear box is also used to insure more accurate travel and greater speed range.

Precision Linear Boom Weld Travel Drive Mechanism

Upgrade the linear boom travel mechanism for precision linear welding applications. Boom design and boom drive are enhanced for smoother, more accurate travel required for these welding processes. Upgrade includes Helical gear rack drive and Servomotor with encoder feedback



Motorized Travel Cart

The standard manipulator can include a motorized travel cart. The standard carts are friction driven, using an AC Motor drive with gearbox to drive one axle of the cart. AMET supplies prints so customer can manufacture their own base rails.



Travel carts are designed to hold weld gear and gas bottles for one weld head as standard. AMET can design larger travel carts upon request.

All travel carts also include manual gearing for column rotation. The operator turns a handle on the side of the cart to rotate the CBM into position.



Precision version also available, with Servomotor with encoder drive and uses gear rack instead of friction.

Standard Base Rails

AMET can supply the customer with standard base rails for the standard friction drive travel cart. Customer installs mounting pads to their factory floor and then installs and level rails for travel motion.

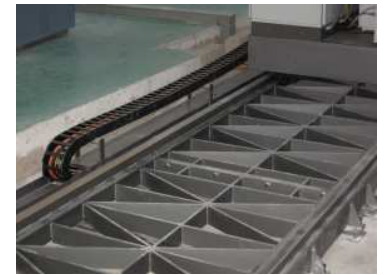


Variable Speed Drive

AMET can provide AC variable speed drives for the column lift and the travel cart. AMET uses a variable speed vector drive and appropriate AC motor for this capability.

Precision Base Rail Assembly

AMET can supply the customer with precision base rail assembly for the standard friction drive travel cart, enhanced with variable speed drive or for servo drive. These are applications where the travel cart will be used as a welding axis. A fabricated base assembly is made and stress relieved. The assembly is machined and the rails are mounted to it.



Servo Grade / CNC Base Rail Assembly

AMET can also supply the customer with a base rail assembly designed for CNC travel cart motion. The precision base rail assembly is enhanced with linear rails and servo grade motor and gear box is used to drive the travel carriage using ball screw drive or robotic grade, helical gear rack.

Operator Platform (for travel cart only)

The travel cart can be fitted with a operator platform, which extends from the travel cart. This feature allows the operator to move out closer to the weld zone. Maximum 1 meter extension allowed.



Product Overview

Welding Positioners

AMET can also supply welding positioners to hold, rotate and tilt the part under the weld head. These positioners are made in many models to meet your exact requirements.



Turning Rolls

AMET manufactures a complete line of powered and idler turning rolls for welding application. These turning rolls assist in rotating and supporting vessels under the weld head during welding. Please see separate literature.



Manual Torch Pivot and Tilt Axis

AMET can supply single axis or dual axis pivot assemblies to allow the operator to have manual tilt and pivot adjustment. Tilt axis for fillet welding are rated for +/- 45 degrees and Pivot axis for Lead/Lag angles are rated for +/- 15 degrees. Please see separate literature.



Motorized Tilting Boom

On the CBML series of manipulators, AMET can add motorized tilting of the boom to provide special boom and torch angles.



Manual Cross-Slides

AMET can supply single axis or dual axis manual cross slides to allow the operator to have manually adjusted cross seam and vertical stand-off positioning of the weld head. The slides include necessary mounting hardware. Please see separate literature for slide strokes and weight capacities.



Manual Torch Swivel Axis

AMET can supply a +/- 90 Weld Head swivel. This mounting bracket is typically used to rotate the weld head between linear and circumferential welding orientation. We also have a version designed to swivel the weld head from TDC position to the 3 o'clock welding position.



AMET can supply a single axis or dual axis motorized cross slides for minor torch adjustment. Includes slide assembly, variable speed control and a joystick pendant for positioning the torch position. AMET can offer the motorized slide in 4 different weight configurations, with various slide strokes. Slides include necessary mounting hardware. Please see separate literature.



Motorized Cross-Slides