# M-TRAVERSE INSTALLATION/START-UP GUIDE

## CAUTION

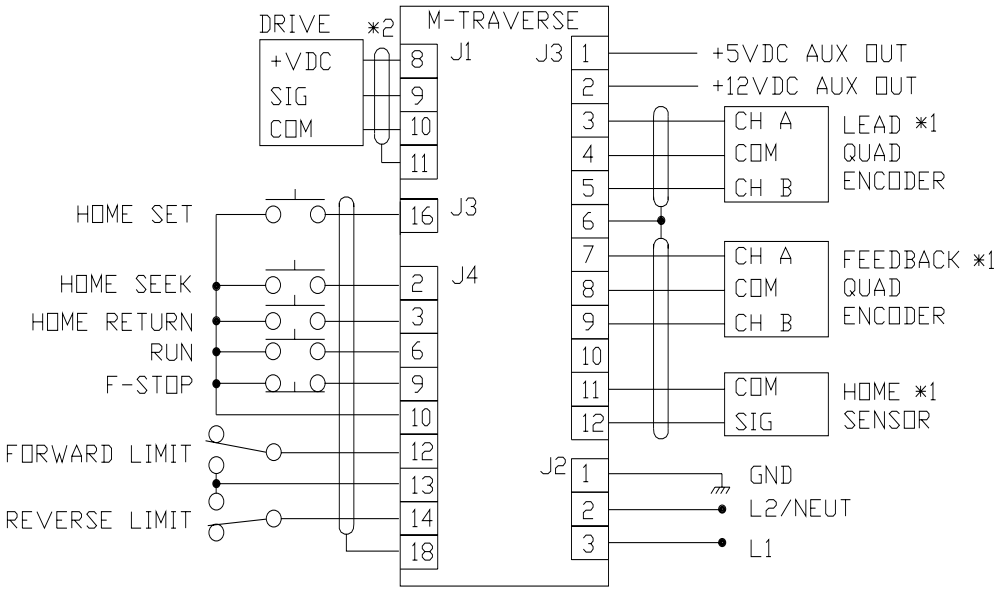
Hazardous Voltages. Can cause severe injury, death or damage to equipment. The M-Traverse should only be installed by a qualified electrician.

Proper earth grounding of all electronic equipment is required for successful operation. Connect a low impedance earth ground to terminal 1 of connector J2.

Separate all logic and signal level wiring (J1, J3, and J4) from all AC power wiring (J2).

Shield all logic and signal wiring (J1, J3 and J4) and terminate to earth ground at one point only.

## TYPICAL WIRING




***1** Encoder and Proximity Switches may require power connections from J3 pins 1 or 2.

***2** J1 pin 8 connection is not required for drives with differential inputs. Refer to User Manual Page 2-4 for jumper requirements using 2 wire drive connections.

# MOTOR DRIVE SET-UP

In order to provide for proper closed-loop operation, it is necessary to calibrate the motor drive maximum speed and response adjustments according to the following procedure:

1. Adjust the lead polarity by rotating the lead encoder in the direction of normal operation while monitoring MV-41. If MV-41 is negative, then exchange the lead encoder lines on J3 pins 3 and 5.

2. Enter a “2" into CP-14 (place M-Traverse into Direct Mode).

3. Enter a positive Direct Mode setpoint of 400 into CP-62 (Direct Analog Command).

4. Enter the RUN State (note: the F-Stop input must be shorted to common prior to activating (shorting) the RUN input). If the follower motor direction does not match the motor direction of the lead during normal operation, then rewire the drive/motor to reverse the motor direction.

5 . Adjust the follower polarity by rotating the follower encoder in the direction of normal operation while monitoring MV-42. If the frequency in MV-42 is negative, then exchange the encoder lines on J3 pins 7 and 9.

6. Set the ACCEL and DECEL potentiometers on the motor drive to the minimum times (fastest response).

7. Set the I.R. Compensation potentiometer (if present) on the motor drive to its minimum setting.

8. Enter a “3686" into CP-62 (places the output command to 90% of the full 4095 level in forward direction). A “-3686" entry into CP-62 will move in the reverse direction at 90% full output.

9. Adjust the Max Speed potentiometer on the motor drive for the desired maximum operating RPMs. This value should be the same as the CP-19 variable entry. (The speed can be observed in MV-40 if the correct PPR value is first entered into CP-18).

10. Return the M-Traverse to its previous mode by entering the original value into CP-14.

# PROGRAMMING

This section explains how to enter the minimum set of Control Parameters required to verify system operation. Refer to Chapter 5 of the User Manual for a discussion of the remaining parameters available to refine operation for your explicit application.

CP-14 Control Mode

Set CP-14 to 1 for Follower/Standard Mode of operation.

CP-1 Follower Setpoint

Enter your Follower Setpoint into Setpoint 1 (CP-1). The Setpoint Select inputs A and B must be open to activate this setpoint value.

The Follower Setpoint is the laypitch (center-to-center distance between windings on reel) entered in Engineering Units (inches, feet, meters, etc.). The CP-15 parameter will determine the location of the decimal point for all Follower Setpoints.

CP-15 Engineering Units

CP-15 is your Engineering Unit measurement of a laypitch. Place the decimal in the location of your desired resolution (to the tens, hundreds or thousands place). All of the other Control Parameters or Monitor Parameters that display in E.U.s will automatically display the correct decimal position.

CP-16 Lead PPR Reel

CP-16 is the number of Lead encoder lines that the Lead Frequency input registers as a result of one revolution of the reel. When you calculate this variable, be sure to consider all gear reductions, belt reductions and other types of reducers. Use the following procedure to check CP-16:

1) Place the M-Traverse in F-Stop.
2) Activate the Home Set input (clears the Lead position to zero).
3) Place the M-Traverse in F-Stop.
4) Display MV-43 (Lead Position).
5) Move the Lead one revolution of the reel.
6) MV-43 should now be the same as CP-16.

CP-17 Follower Lines per Engineering Units

CP-17 is the number of Follower encoder lines that the Feedback Frequency input registers as a result of the Follower laypitch that was entered in CP-15. When you calculate this variable, be sure to consider all gear reductions, belt reductions and other types of reducers. Use the following procedure to check CP-17:

1) Place the M-Traverse in F-Stop.
2) Activate the Home Set input (clears the Follower position to zero).
3) Place the M-Traverse in F-Stop.
4) Display MV-44 (Follower Position).
5) Move the Follower one laypitch (CP-15).
6) MV-44 should now be the same as CP-17.

CP-18 PPR Follower (Feedback)

The PPR Follower (CP-18) parameter is the number of pulses per revolution of the feedback encoder (encoder resolution in lines).

CP-19 Maximum RPM Follower (Feedback)

The Maximum RPM Follower (CP-19) parameter is the RPM of the feedback encoder shaft when the Follower is operating at maximum speed. When you calculate this variable, be sure to consider all gear reductions, belt reductions and other types of reducers.

CP-2 Traverse Length

The Traverse Length (CP-2) is the distance in Engineering Units that the Follower mechanism will travel. The Traverse Length is generally the length of the reel.

CP-9 Accel/Decel Length

The Accel/Decel Length (CP-9) parameter allows the Follower mechanism to ramp to either the constant pitch plateau or end dwell, either gradually or rapidly. This parameter is the number of encoder lines for the desired Accel/Decel Length.

CP-10 Dwell

The Dwell (CP-10) parameter allows the Follower mechanism to pause at the end of the Follower profile before ramping back in the opposite direction. This parameter is a portion of the encoder lines in one revolution of the reel (Lead).

# TUNING

If your system is unstable, or the position error is unacceptable, tuning may stabilize your system or reduce the position error differences between the setpoint and feedback. You can achieve a stable system using conservative values in the Tuning Control parameters, however the position error may be unacceptable. On the other hand, aggressive values in the Tuning Control parameters may cause the system to become unstable. The goal is to reduce the position error to the level that you want, yet maintain the system's stability.

To achieve an acceptable level of position error, increase the Gain (CP-65) parameter until the system becomes unstable then reduce the CP-65 incrementally until the system stabilizes. In systems that require greater accuracy, it may be necessary to adjust the Integral (CP-66) parameter to reduce any remaining position error.

CP-65 Gain

To adjust the Gain term, first enter a value of zero into CP-66 (Integral). With the M-Shuttle running at the maximum process speed, increase the value in CP-65 until the system starts to become unstable (instability can be observed by erratic motion or audible disturbances). Once the point of instability is found, reduce the CP-65 value slightly until the system stabilizes.

CP-66 Integral

If your system error is unacceptable after adjusting only the Gain term, it may be necessary to add some Integral to reduce the final position error. While running at maximum process speed, add slight increases to the Integral term (CP-66) until the error is reduced to an acceptable level (note: leave the Gain term in when adjusting Integral).