SK1417

M-TRACK SET-UP GUIDE **rev 1.0 2-14-94**

1 INTRODUCTION

The purpose of this document is to shorten as much as possible the time required to get an M-TRACK system running. It is *not* a substitute for the manual. For additional information refer to the pages of the manual indicated in braces, as {2-4}.

2 M-TRACK SYSTEMS CHARACTERISTICS

2.1 Pairs of Objects

The distinguishing characteristic of processes that require M-TRACK control is two rows, *each one* consisting of evenly spaced, identical objects, both moving at constant speed, the objects ultimately being paired up, one from each row. Often these are packaging or assembly processes; examples being containers and lids or perforations at registration marks on webs. In systems controlled by M-TRACK's, one channel is designated the "Master" and the other the "Follower".

2.2 Unique Speed Ratio

While the objects of each row move at the same rate, the spacing of objects in one row generally differs from that in the other. Additionally, the gearing of each motor is typically not the same. This means that the two motors must run at a constant speed ratio to each other. Also the ratio is typically unique for a given product. Both motors have encoders mounted to enable the control to monitor and maintain this speed ratio.

2.3 Registration

As the two rows of objects come together the placement of the objects in one row relative to those in the other is important, i.e. the "lids" must not fall between the "bottles". This is called phase or offset, and to control it, the M-TRACK uses a pair of registration sensors (Ext. Ref. Sync & Feedback Sync) to determine the objects relative location. It then temporarily adjusts the speed of the follower motor to eliminate any phase errors.

3 CONFIGURATION {2-1}

3.1 "Configuration" involves setting switches and positioning jumpers inside the M-TRACK. This is necessary only if your requirements differ from the factory default settings and will require removing the backplate to gain access. The default settings are set in **bold** type and identified in the figures 3 and 4.

3.2 Power Supply/Isolator Board:

3.2.1 Line voltage selection {2-4}

The M-TRACK has a clearly marked switch near the fuse to configure for either **115 VAC** or 230 VAC.

3.2.2 Isolated voltage reference {2-4}

The M-TRACK's principal output is an isolated signal level voltage, typically used as a speed command input by a motor drive or servo amp. These inputs are either of the three wire potentiometer or two wire differential variety. If available use the differential input. The M-TRACK has two possible command output configurations to accommodate these devices: **Auto Ranging** for the three wire and Internal Reference for the two wire. J3 near the top of the Power Supply/Isolator board controls this. See figures 1, 2 & 3 for the details.

3.3 CPU board

3.3.1 Frequency inputs {2-2}

The M-TRACK requires encoders with square wave, NPN open collector outputs. They may be either **quadrature** (two signal channels) or incremental (one signal channel) The long shunt (J2) on the CPU board is used to configure the M-TRACK appropriately. See figure 4 for details.

3.3.2 Sync. input filter {2-3}

The M-Tack hardware filters present on the registration (Sync) inputs to minimize noise problems. These filters are normally **enabled.** If these registration signals are less than 2 ms, the filters on these inputs will have to be disabled. This is done by removing the appropriate shunt from J5 of the CPU board. See figure 4 for details.

4 WIRING

WARNING

Hazardous voltages are present during certain installation procedures. Therefore, the M-TRACK should only be installed by qualified electrical maintenance personnel.

***** IMPORTANT *****

YOU MUST FOLLOW STANDARD PRACTICES FOR THE WIRING OF MICROPROCESSOR BASED CONTROLLERS AT ALL TIMES. USE APPROPRIATE SHIELDING, ROUTING AND SUPPRESSION TECHNIQUES.-See yellow sheet: Wiring Procedures

4.1 Required Wiring {3-7}
See figure 5 for the minimum wiring requirements for all M-TRACK systems. Note that for the M-TRACK to enter *and remain in* the "RUN" state, F-STOP and R-STOP (J4-8&9) must be shorted to common.

4.2 Optional Wiring {3-11}

5 CALIBRATION {4-1}

5.1 Adjust the drives IR-Comp to its minimum effectiveness and set its accel and decel to their minimum time.

5.2 Place the M-TRACK in direct scaling mode by entering a "1" into CP 19.

5.3 Enter a positive direct mode value of 400 into CP 7.

5.4 Initiate the "RUN" state. If the motor is not going in the direction of normal operation (fwd) then invoke "R-STOP", remove power and rewire the drive/motor to achieve correct motor rotation direction.

5.5 Once the motor is going the correct direction, observe the polarity of the number in MV 42. If it is negative then switch the A and B channel wiring (J3 pins 7 & 9) of the feedback device.

5.6 Enter the value of PPR of the feedback device into CP 11. Enter 3686 into CP 7 and initiate "RUN". Record the value that appears in MV 40 and invoke "R-STOP". Enter the recorded value from MV 40 into CP 13.

5.7 Rotate the "Master" motor in the direction of normal operation and note the polarity of the value in MV 41. If the value is negative then switch the A and B channel wiring (J3 pins 3 & 5) of the lead encoder.

6 PROGRAMMING {5-1}

The M-TRACK has three main modes of operation. This guide will address only two: "LEARN" and "FIXED". If "FLEX" mode is required, first complete this procedure and then consult page 8-2 in the manual.

6.1 Enter a "2" into CP 18 (Learn Mode Scaling).

6.2 Verify the following:
CP 31=0 (phase = 0)
CP 30=1 (sync logic set to "CLOSEST")
CP 34=1 (sync is enabled)

6.3 Press the "SETPOINT" key and verify "LP--01" appears in the upper LED field.

6.4 Initiate "RUN"

6.5 Operate master motor at about quarter speed.

6.6 After several Sync signals of each channel have gone by the LP--01 will be replaced by "1". This indicates that the M-TRACK has determined the unique speed ratio required to maintain registration.

6.7 If the "LP--01" never clears, verify that MV 41 is greater than 100 and that the "REF SYNC" and "FDBK SYNC" LEDs illuminate briefly as the registration sensors are activated.

6.8 Note the value in CP 85.

6.9 Invoke "R-STOP".

6.10 Enter a "1" into CP 18 and enter the recorded value from MV 85 into CP 1.

6.11 Initiate "RUN" and if the system is not quite stable follow the tuning instructions in the manual {5-6}.

6.12 Inspect the accuracy of the registration and shift the follower forward or backward by experimenting with numbers in CP 31. Larger positive numbers mean the follower will shift further aft. Increasing negative numbers will shift the follower forward.

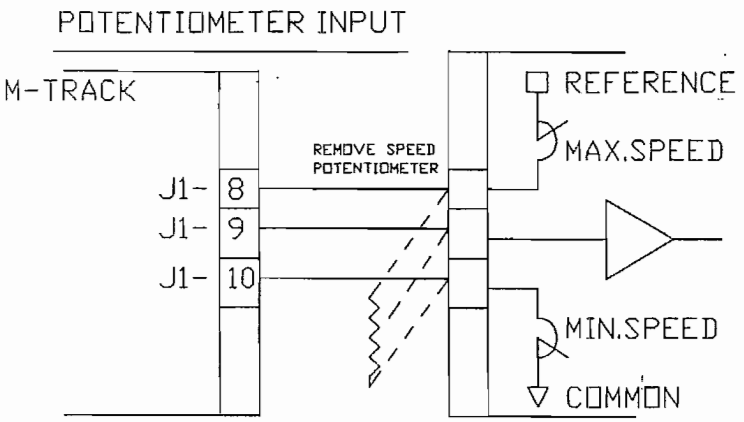

FIG 1

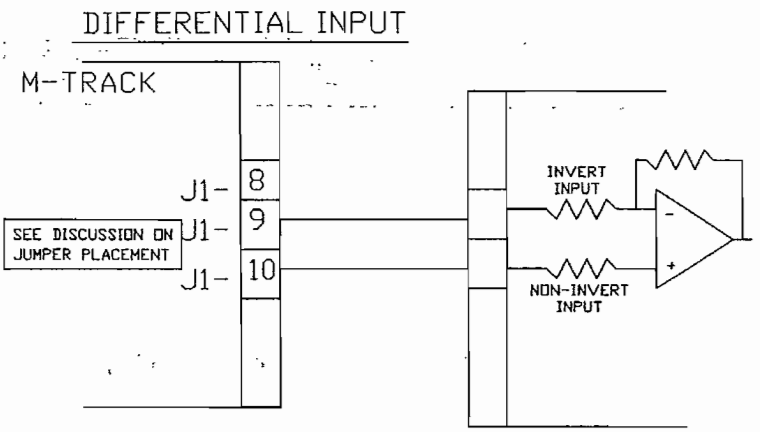

FIG 2

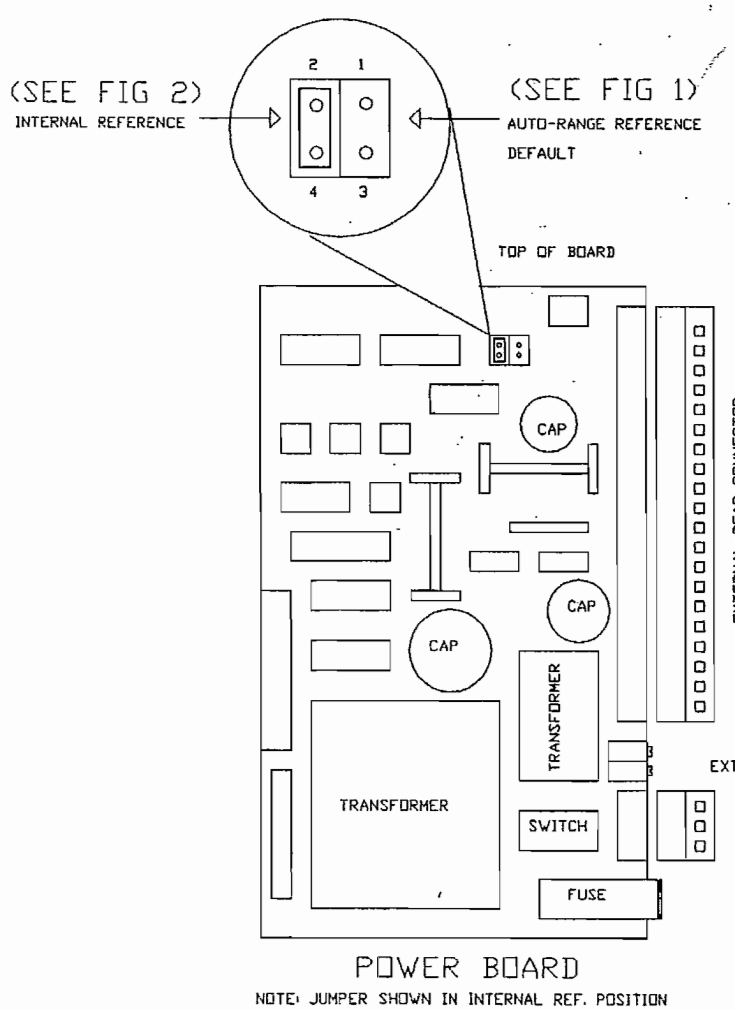

FIG 3

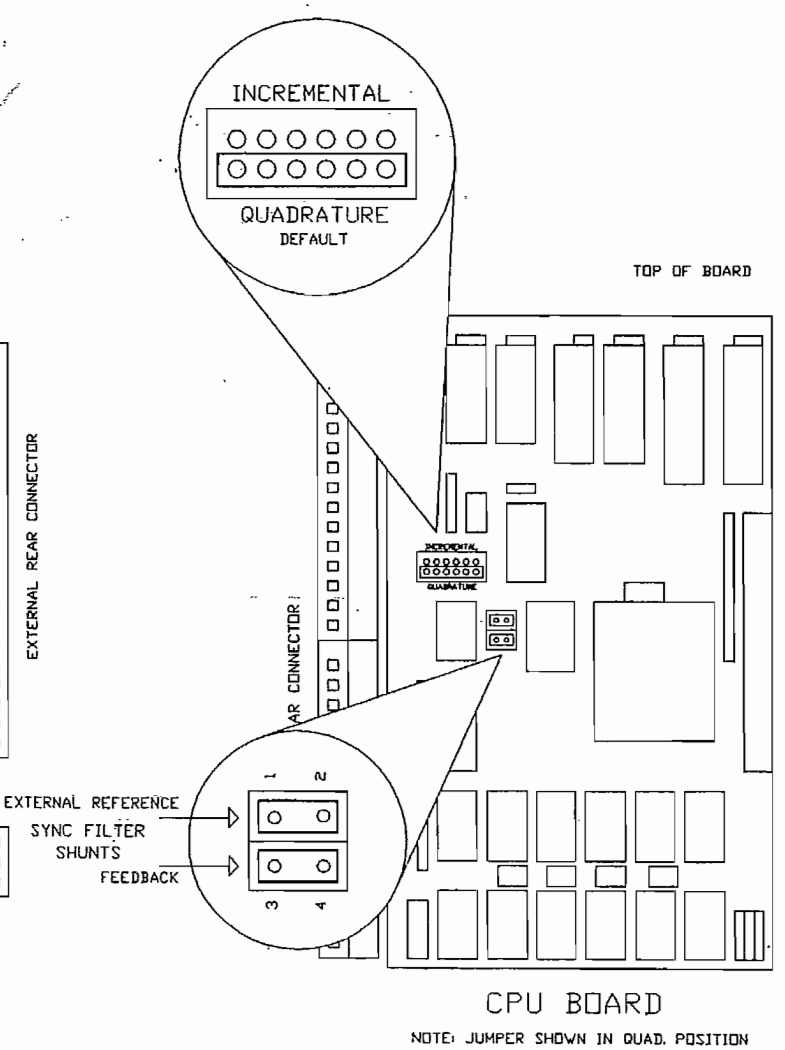

FIG 4

SIMPLIFIED CONNECTION DIAGRAM

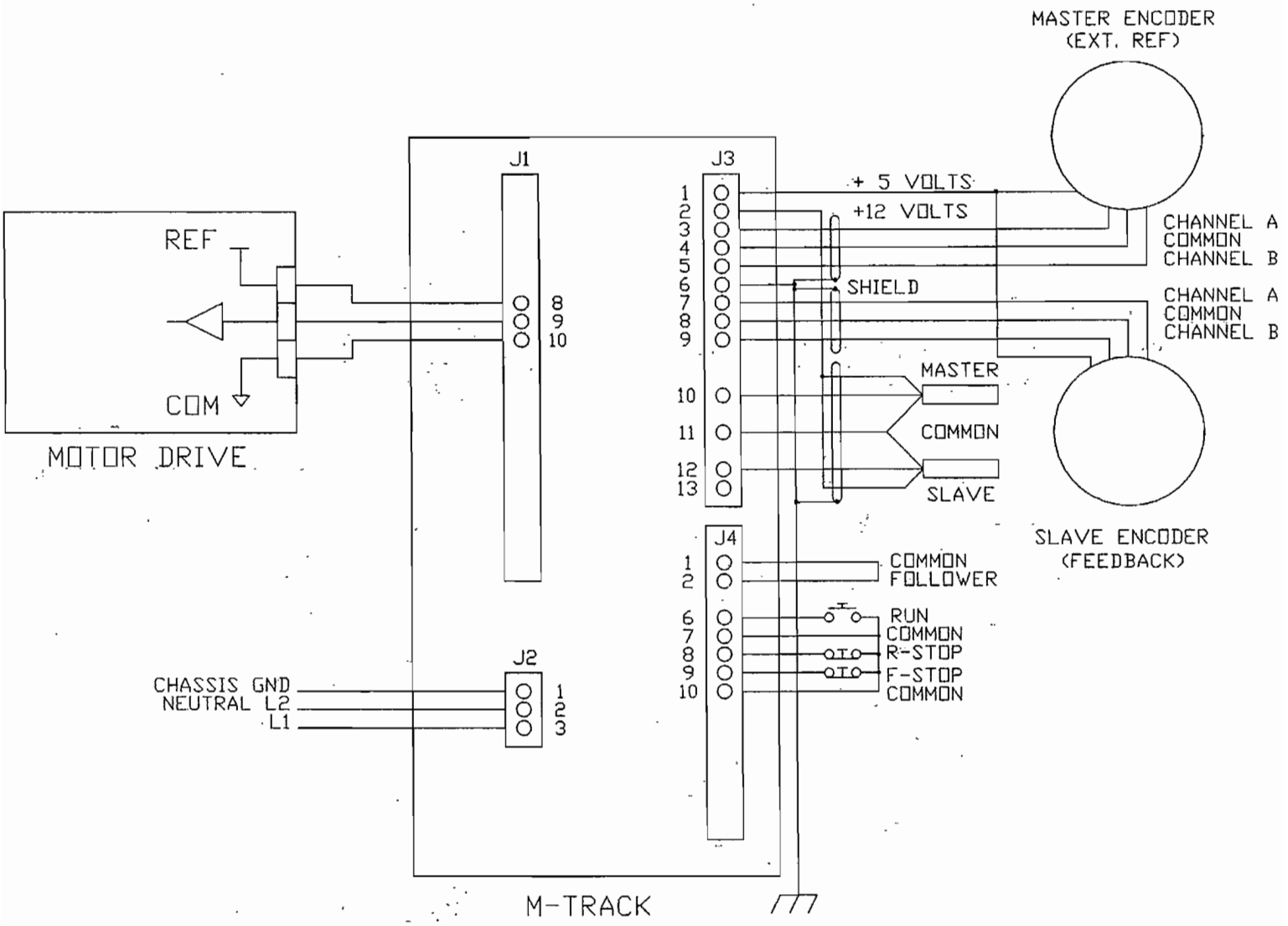

FIG. 5