KNOWLEDGE BASE

Article Type: Instructions

RTS
Set-up / Configuration Procedure & Installation

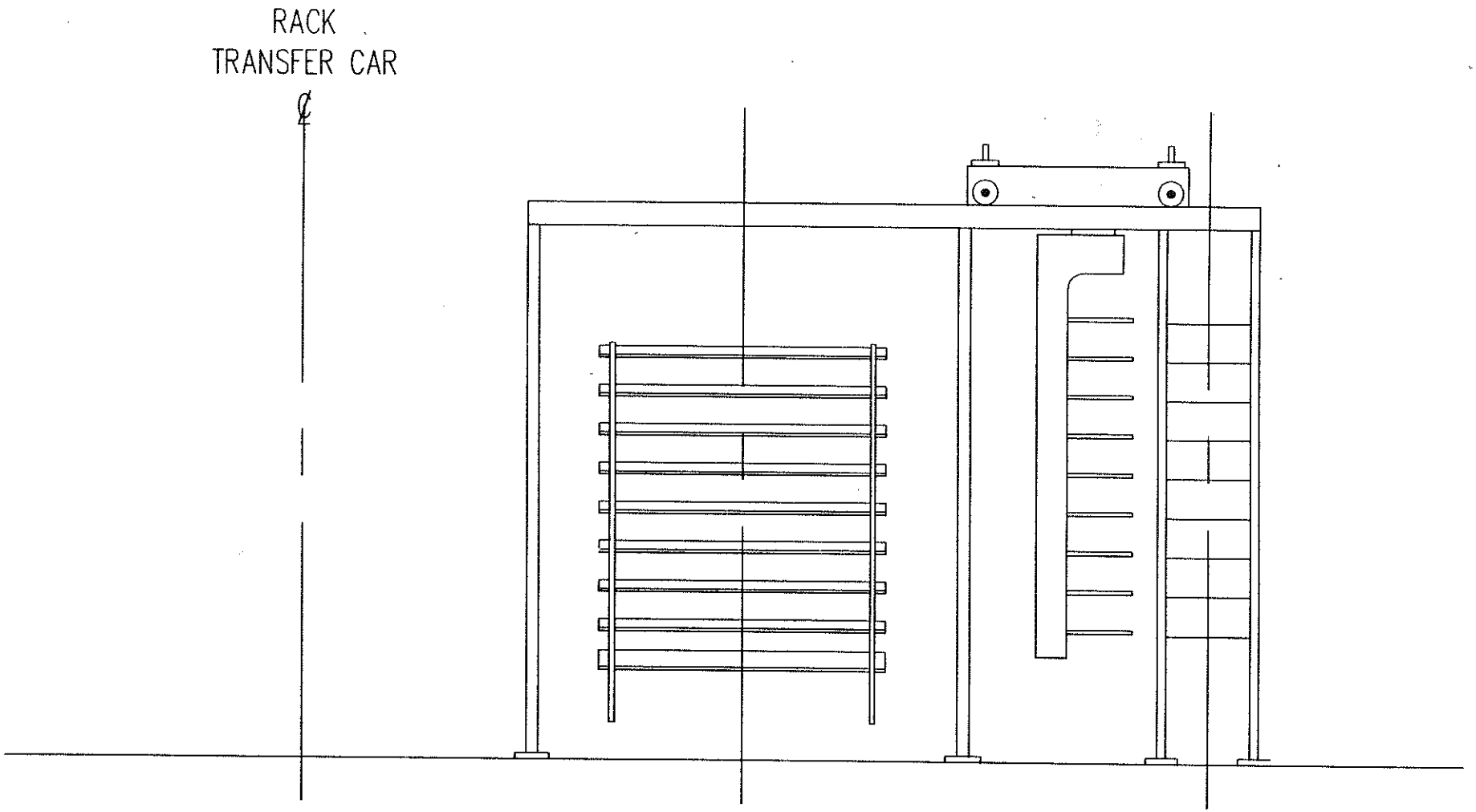
Description:

Instructions on "How to" set-up / configuration procedure and installation on RTS using TI545 PLC. This document is intended for Service Representatives and Engineers.

WARNING

Never work on, clean or service this unit, control panel or any machine or open or remove any protective cover, guard, grate, door, or maintenance panel until the power or energy sources has been turned off, locked out / tagged out, and all moving parts have come to a complete stop and or blocked to prevent movement. Machinery is dangerous – avoid personal injury and or death by following manufacture, Local, and OHSA safety procedures. Contact Columbia Machine for safety decals, guards, horns and beacons.

RACK TRANSFER SYSTEM



CHECK LIST (PALLET HANDLING SYSTEM)

Before putting the Pallet Handling System (Loader & Unloader) in Automatic, please check off the following items:

LOADER:

	YES	NO
* LOADER VELOCITY (SPEED) SETTING	☐	☐
* LOADER ACCELERATION & DECELERATION (RAMP) SETTING	☐	☐
* LOADER LOCATION COUNTS SETTING	☐	☐
* LOADER COUNTS TABLE: FROM HOME POSITION TO PALLETS IN RACK	☐	☐
* LOADER CREEP COUNTS TABLE: FROM HOME POS. TO PALLETS IN RACK	☐	☐
* LOADER CREEP COUNTS TABLE: FROM PALLETS IN RACK TO HOME POS.	☐	☐
* V194 - COUNTS FROM HOME POS. TO STACKER POSITION	☐	☐
* V174 - CREEP COUNTS FROM HOME POS. TO STACKER POSITION	☐	☐
* V170 - COUNTS AT HOME POSITION	☐	☐
* V176 - CREEP COUNT FROM STACKER POS. TO HOME POS.	☐	☐
* V197 - NO. OF COUNTS FROM CREEP SPEED TO ZERO (STOP)	☐	☐

FROM MAIN PANEL		LOADER TI PANEL	
V548 - LK #	_____	V538 - LK #	_____
V549 - UK #	_____	V539 - UK #	_____
V30 - PASS #	_____	V540 - PASS #	_____

NOTE: The LOADER also has a double check circuit for current Pass Number, V30. Please made sure that both V30 & V31 are set to the correct setting compare to the Main Control Panel.

V30 - Current Pass #
V31 - Number of Pass per Kiln.

UNLOADER:

	YES	NO
* UNLOADER VELOCITY (SPEED) SETTING	☐	☐
* UNLOADER ACCELERATION & DECELERATION (RAMP) SETTING	☐	☐
* UNLOADER LOCATION COUNTS SETTING	☐	☐
* UNLOADER COUNTS TABLE: FROM HOME POSITION TO PALLETS IN RACK	☐	☐
* UNLOADER CREEP COUNTS TABLE: FROM HOME POS. TO PALLETS IN RACK	☐	☐
* UNLOADER CREEP COUNTS TABLE: FROM PALLETS IN RACK TO HOME POS.	☐	☐
* V192 - COUNTS FROM HOME POS. TO UNSTACKER POSITION	☐	☐
* V172 - CREEP COUNTS FROM HOME POS. TO UNSTACKER POSITION	☐	☐
* V270 - COUNTS AT HOME POSITION	☐	☐
* V276 - CREEP COUNT FROM UNSTACKER POS. TO HOME POS.	☐	☐
* V297 - NO. OF COUNTS FROM CREEP SPEED TO ZERO (STOP)	☐	☐

NOTE: If you check any NO box, please refer to the R.T.C. Electrical Installation Guide to complete all the SPEED, RAMP, and COUNTS setting. If the LK, UK, and PASS # are not the same, please refer to the program sheet.

CHECK LIST (RACK TRANSPORTER CAR)

Before putting the Rack Transporter Car (Locar & Upcar) in Automatic, please check off the following items:

LOCAR:

	YES	NO
* LOCAR VELOCITY (SPEED) SETTING	☐	☐
* LOCAR ACCELERATION & DECELERATION (RAMP) SETTING	☐	☐
* LOCAR COUNTS TABLE: FROM ORIGIN TO KILNS	☐	☐
* LOCAR CREEP COUNTS TABLE: FROM ORIGIN TO LOAD KILN	☐	☐
* LOCAR CREEP COUNTS TABLE: FROM LOAD KILN TO UNLOAD KILN	☐	☐
* LOCAR CREEP COUNTS TABLE: FROM UNLOAD KILN TO UNSTACKER	☐	☐
* V192 - UNSTACKER POSITION	☐	☐
* V194 - STACKER POSITION	☐	☐
* V197 - NO. OF COUNTS FROM CREEP SPEED TO ZERO (STOP)	☐	☐
* V310 - CREEP COUNT FROM UNSTACKER TO STACKER	☐	☐
* V311 - CREEP COUNT FROM STACKER TO UNSTACKER	☐	☐

FROM MAIN PANEL		LOCAR TI PANEL	
V548 - LK #	_____	V538 - LK #	_____
V549 - UK #	_____	V539 - UK #	_____
V30 - PASS #	_____	V540 - PASS #	_____

NOTE: The Locar also has a double check circuit for current Pass Number, V30. Please made sure that both V30 & V31 are set to the correct setting compare to the Main Control Panel.

V30 - Current Pass #
V31 - Number of Pass per Kiln.

UPCAR:

	YES	NO
* UPCAR VELOCITY (SPEED) SETTING	☐	☐
* UPCAR ACCELERATION & DECELERATION (RAMP) SETTING	☐	☐
* UPCAR COUNTS TABLE: LOAD KILN COUNTS	☐	☐
* UPCAR CREEP COUNTS TABLE: GOING INTO LOAD KILN	☐	☐
* UPCAR CREEP COUNTS TABLE: GOING OUT OF LOAD KILN	☐	☐
* UPCAR COUNTS TABLE: UNLOAD KILN COUNTS	☐	☐
* UPCAR CREEP COUNTS TABLE: GOING INTO UNLOAD KILN	☐	☐
* UPCAR CREEP COUNTS TABLE: GOING OUT OF UNLOAD KILN	☐	☐
* V192 - COUNTS TO RACK POSITION IN THE UNLOADER	☐	☐
* V172 - CREEP COUNTS TO RACK POSITION IN THE UNLOADER	☐	☐
* V194 - COUNTS TO RACK POSITION IN THE LOADER	☐	☐
* V174 - CREEP COUNTS TO RACK POSITION IN THE LOADER	☐	☐
* V197 - NO. OF COUNTS FROM CREEP SPEED TO ZERO (STOP)	☐	☐
* V170 - COUNTS AT HOME POSITION FOR UPCAR	☐	☐
* V171 - CREEP COUNTS FROM UNLOADER POSITION TO HOME POSITION	☐	☐
* V176 - CREEP COUNTS FROM LOADER POSITION TO HOME POSITION	☐	☐

NOTE: If you check any NO box, please refer to the R.T.C. Electrical Installation Guide to complete all the SPEED, RAMP, and COUNTS setting. If the LK, UK, and PASS # are not the same, please refer to the program sheet.

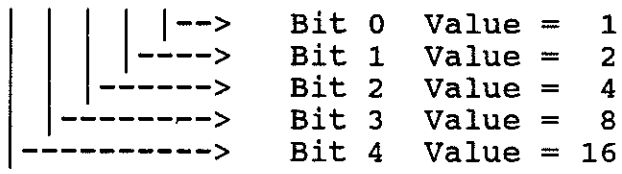
COMMUNICATION

All communication for the system passes through the Locar. All signals supplied to the Locar from the Main panel which are direct connection signals. These signals are as follows:

OK to enter Loader
OK to enter Unloader

In addition, the Main panel supplies Load Kiln number, Unload Kiln number, and Pass number to the Locar by using discrete I/O. Five (5) individual lines supply this information in the form of Binary.

For example: 25 = 1 1 0 0 1 = 16 + 8 + 1 = 25



12 = 0 1 1 0 0 = 8 + 4 = 12

15 = 0 1 1 1 1 = 8 + 4 + 2 + 1 = 15

MAIN PANEL OUTPUTS			LOCAR PANEL INPUTS	
Y166	Bit 0	------>	X27	Bit 0
Y167	Bit 1	------>	X28	Bit 1
Y168	Bit 2	------>	X29	Bit 2
Y169	Bit 3	------>	X30	Bit 3
Y170	Bit 4	------>	X31	Bit 4

These Bits are programmed to turn "ON" a set of outputs that represent a number being sent to the Locar. The outputs that represent the Load kiln, Unload kiln, and Pass number will be separate with a Stop Bit or an "OFF" period between duration. Each output sequence will stay on for a Preset time in the program; however, each sequence must have a different "ON" time for the Locar to recognize a correct signal.

For example:

SIGNAL		NO.	OUTPUTS (1 = ON ; 0 = OFF)	
LK #	--->	2	0 0 0 1 0	"ON" for 0.5 second
Stop Bit	--->	0	0 0 0 0 0	"OFF" for 0.5 second
UK #	--->	3	0 0 0 1 1	"ON" for 1.0 second
Stop Bit	--->	0	0 0 0 0 0	"OFF" for 0.5 second
Pass #	--->	11	0 1 1 0 1	"ON" for 1.5 second
Stop Bit	--->	0	0 0 0 0 0	"OFF" for 0.5 second

There are three (3) return signals to the Main panel from the Locar Control Panel by direct connection. These signals are as follows:

Upcar on Locar
Pass Completed
Alarm for Car problems

COMMUNICATION BETWEEN LOCAR & UPCAR:

The Locar communicates with the Upcar with two set of transmitters and receivers. The communication is in the form of pulse trains with a Stop Bit that is a time period off for about twice the normal pulse off duration. The primary difference between the communication from the Main panel to the Locar and the Locar to the Upcar is that the information sent to the Upcar is being confirmed back at the Locar.

For example:

If the Locar sends a **"8"** to the Upcar after receiving, the Upcar will respond with a chain of pulses that represent a receiving number back to the Locar for confirmation. If the pulses sent and pulses received are equal, then the communication will continue otherwise it will repeat.

It is important to note that the Upcar also uses the transmitter to send a Task Completed signal back to the Locar. Since the output from the Upcar is normally in the form of pulses of a set duration, it is never in an "ON" state for more than a fraction of a second. The Upcar will signal the Locar that it has completed a "Task" by holding the output in a high state for .1 second longer than the "ON" time for a normal pulse. The Locar interprets this long duration high state as a "Task Complete" signal.

The Locar initiates the communication by sending a number to the Upcar. After receiving, the Upcar will then repeat back the number which will allow the Locar to continue or to wait for the "Task Complete" signal in some cases.

A number greater than **10** is interpreted by the Upcar as a Pass number. If we send a "12", the Upcar will respond with a "12", but will store a "2" in it's buffer for the Pass number data. This information must be supplied to the Upcar before the command to enter the Load Kiln or the Unload Kiln.

The "Task Command" is represented by a number between "4" and "9"

#4 - OK to enter Loader
#6 - OK to enter Unloader
#7 - OK to enter Load Kiln
#8 - OK to enter Unload Kiln

#2 - OK to go signal

The "Task Command" does not initiate any action alone. They require that a "2" be sent after all information is confirmed by the Locar.

COMMUNICATION SEQUENCE

* While the Locar is in motion on the way to the Loader, it will send a "**4**" to instruct the Upcar that it will be going to the Loader. When the Locar has arrived at the Loader and fully docked,

* The "OK to go - **2**" signal is given from the Main panel when the Rack is present at the Loader position, Loader conveyor on the Open sw., and the RTC button in the Main panel is in "Automatic". The Upcar will enter the Loader to pick up the rack.

* While the Locar is in motion on the way to the Load Kiln, it will send a "**7**" to instruct the Upcar that it will be entering the Load Kiln. After confirmation, the Locar will send a number greater than **10** to the Upcar to tell it what Pass number is being processed. When the Locar has arrived at the Load Kiln and is fully docked, it will send the "**2**" to the Upcar allowing the Upcar to enter the LK.

* While the Locar is in motion on the way to the Unload Kiln, it will send a "**8**" to instruct the Upcar that it will be entering the Unload Kiln to pick up a rack. When the Locar has arrived at the Unload Kiln and is fully docked, it will send the "**2**" to the Upcar allowing the Upcar to enter the UK.

* While the Locar is in motion on the way to the Unloader, the Locar will send the "6 - Enter Unloader" signal to the Upcar to instruct the Upcar that it will be entering the Unloader. After the Locar has arrived at the Unloader and is fully docked, the Locar is waiting for the "Unloader Empty or clear - X261" signal from the Main panel allowing the Upcar to enter the Unloader. When the Locar received that signal, it will send the "**2**" to the Upcar allowing the Upcar to enter the Unloader.

In all the above cases, the Locar is notified by the Upcar that it has completed the task that the Locar assigned by the pulse on the output (input to the Locar) of more than .5 second duration. Note that the duration of the pulse is set by the setup delay of Event Drum 1, position 10 in the Upcar program. This duration should not ever be set less than .5 seconds.

Once again it should be noted that this "Task Complete" signal will be missed by the Locar if it is switched out of "Automatic" when the Upcar returns.

FOR CALIBRATION OR TROUBLE-SHOOTING TO THE LOCAR:

If calibration or trouble-shooting is being done to the Locar, V900 is being used as a Upcar bypass signal to the Locar. Entering a "1" in V900 will deliver the same signal to the Locar that it would get if the Upcar had completed its task. This means that the Locar can be exercised through its program with the Upcar out of "Automatic".

NOTE: It is very important to remember to RESET the Locar at the Loader before operating in this manner.

1. Entering a "1" in V900 will tell the Locar that the Upcar has completed the assigned task (enter the Loader & pick up the rack) and has returned to its home position on the Locar. The Locar will undock and travel to the Load Kiln.

2. Entering a "1" in V900 will tell the Locar that the Upcar has completed the assigned task (enter the Load Kiln to deliver the rack) and has returned to its home position on the Locar. The Locar will undock and travel to the Unload Kiln.

3. Entering a "1" in V900 will tell the Locar that the Upcar has completed the assigned task (enter the Unload Kiln to pick up the rack) and has returned to its home position on the Locar. The Locar will undock and travel to the Unloader.

4. Entering a "1" in V900 will tell the Locar that the Upcar has completed the assigned task (enter the Unloader to deliver the rack) and has returned to its home position on the Locar. The Locar will undock and travel to the Loader.

   Note that each time the Locar travels from the Unloader to the Loader, it sends a Pass Complete Signal to the Main panel. This will advance the Pass Number but it will have no effect on the Locar until the last pass has been completed. It will then step the Production Table (Load/Unload Table) in the main panel and the car will switch to the next Load/Unload pair.

This technique saves a great deal of time when work or adjustment is being done to the Locar due to the fact that we do not have to wait for the Upcar to do its sequence each time.

FOR CALIBRATION OR TROUBLE-SHOOTING TO THE UPCAR:

If calibration or trouble-shooting is being done to the Upcar, V312 is being used as a message data received from the Locar. This means that the Upcar can be exercised through its program at the Loader, Load Kiln, Unload Kiln, and Unloader with the Locar out of "Automatic".

NOTE: It is very important to remember to RESET the Upcar and the Locar is to be fully docked before operating in this manner.

* At Loader - Enter the Loader:
  - Upcar Forks must be down.
  - Enter a **"4"** in V312 followed by a OK to go signal **"2"**, this will allow the Upcar to travel forward to the Loader and creep until the Rack on Upcar switch is engaged.

* At Load Kiln:
  - Upcar Forks must be up.
  - Enter Pass Number in V312.
  - Enter a **"7"** in V312 followed by a OK to go signal **"2"**, this will allow the Upcar to travel forward to a previously specified Pass Number in the Load Kiln, lower Forks, and moves in reverse direction back to its home position on the Locar.
  - This can be done for every Pass Number in the Load Kiln.

* At Unload Kiln:
  - Upcar Forks must be down.
  - Enter Pass Number in V312.
  - Enter an **"8"** in V312 followed by a OK to go signal **"2"**, this will allow the Upcar to travel forward to a previously specified Pass Number in the Unload Kiln, and creep until the Rack on Upcar switch is engaged, raises Forks, and travels in reverse direction back to its home position on the Locar.
  - This can be done for every Pass Number in the Unload Kiln.

* At Unloader - Enter the Unloader:
  - Upcar Forks must be up.
  - Enter a **"6"** in V312 followed by a OK to go signal **"2"**, this will allow the Upcar to travel forward to the Unloader, raise Forks, and travel in reverse direction back to its home position on the Locar.

PRODUCTION CYCLE: LOAD & UNLOAD KILN

Location	Kiln no.
V 1	1
V 2	2
V 3	3
V 4	4
V 5	5
V 6	6
V 7	7
V 8	8
V 9	9
V 10	10
V 11	11
V 12	12
V 13	13
V 14	0

Load Kiln Pointer V1001

Unload Kiln Pointer V1002

Load Kiln no. V548

Unload Kiln no. V549

This is the Load Kiln & Unload Kiln table. It can be arranged in any order to fit your needs. The Load Kiln will be determined by the LK pointer V1001, and the Unload Kiln which will be determined by the UK pointer, V1002. The Load Kiln number from the table will be moved into V548, and the Unload Kiln number will be moved into V549.

For example: The Rack Transporter Car (RTC) will load kiln **1** & unload kiln **2**. Next cycle, the RTC will load kiln **2** and unload kiln **3**, and so on...

Entering a '0' into the table will cause the cycle to go back to the start of the table if the Recycle enable bit V851 = 1 else the production will stop when the unload kiln is zero.

If Panelmate is used as a TCAM, set V501 = 0 else set V501 = 1.

PRODUCTION CYCLE: LOAD & UNLOAD KILN

Location	Kiln no.
V 1	
V 2	
V 3	
V 4	
V 5	
V 6	
V 7	
V 8	
V 9	
V 10	
V 11	
V 12	
V 13	
V 14	0

Load Kiln Pointer V1001

Unload Kiln Pointer V1002

Load Kiln no. V548

Unload Kiln no. V549

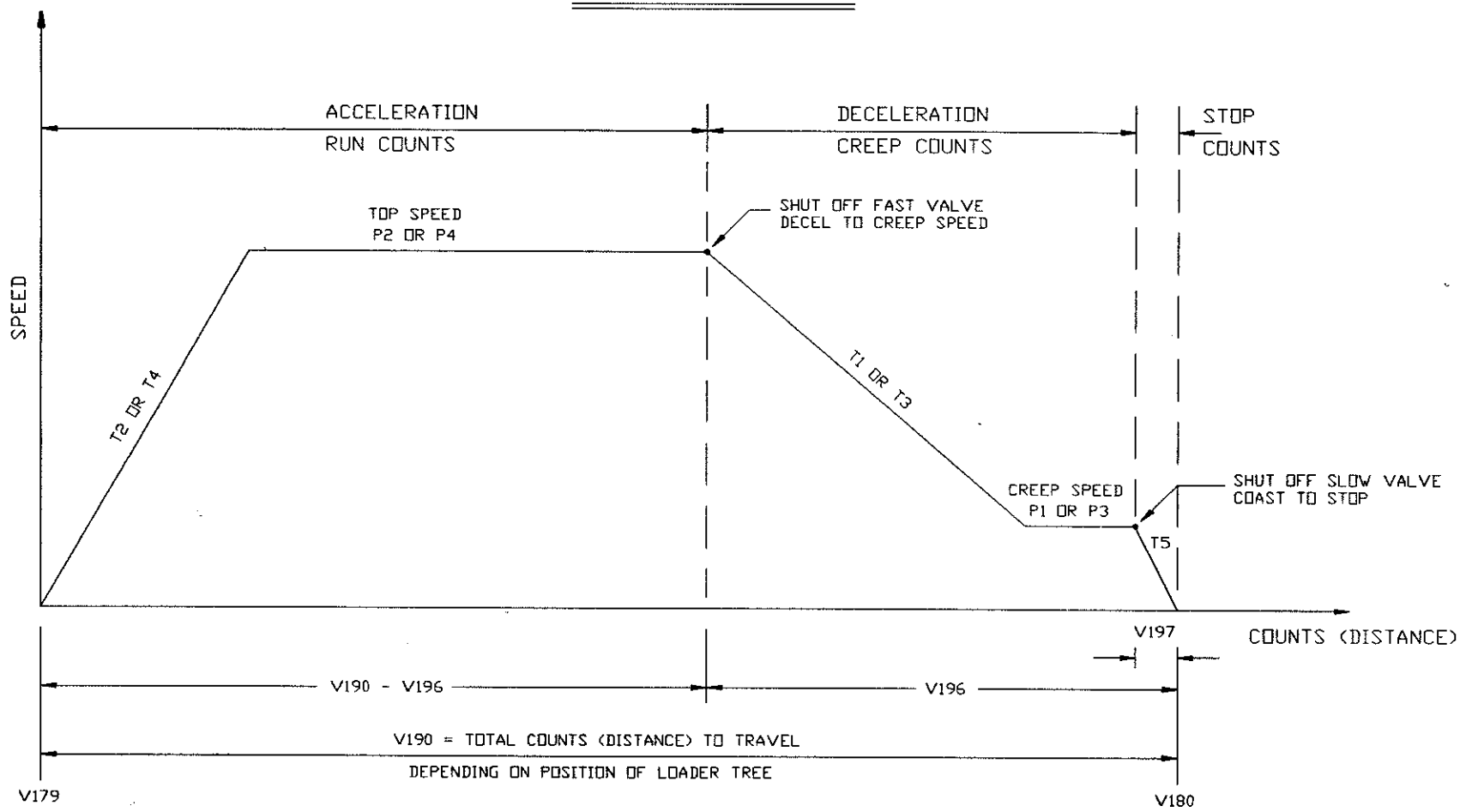
This is the Load Kiln & Unload Kiln table. It can be arranged in any order to fit your needs. The Load Kiln will be determined by the LK pointer V1001, and the Unload Kiln which will be determined by the UK pointer, V1002. The Load Kiln number from the table will be moved into V548, and the Unload Kiln number will be moved into V549.

For example: The Rack Transporter Car (RTC) will load kiln **1** & unload kiln **2**. Next cycle, the RTC will load kiln **2** and unload kiln **3**, and so on...

Entering a '0' into the table will cause the cycle to go back to the start of the table if the Recycle enable bit V851 = 1 else the production will stop when the unload kiln is zero.

If Panelmate is used as a TCAM, set V501 = 0 else set V501 = 1.

LOADER TREE MOTION



V179 - ACTUAL LOADER TREE POSITION (COUNTS)
V180 - COUNT # THAT LOADER TREE GOING TO (DESTINATION)
V181 - REMAINING COUNTS TO TRAVEL FOR LOADER TREE
V190 - TOTAL COUNTS TO TRAVEL
V196 - TOTAL CREEP COUNTS
V197 - # OF COUNTS FOR LOADER TREE TO COAST TO STOP

P1 - FORWARD SLOW OR CREEP SPEED SETPOINT
P2 - FORWARD FAST OR TOP SPEED SETPOINT
P3 - REVERSE SLOW OR CREEP SPEED SETPOINT
P4 - REVERSE FAST OR TOP SPEED SETPOINT

T2 - FORWARD ACCELERATION FROM 0 TO TOP SPEED
T1 - FORWARD DECELERATION FROM TOP TO CREEP SPEED
T4 - REVERSE ACCELERATION FROM 0 TO TOP SPEED
T3 - REVERSE DECELERATION FROM TOP TO CREEP SPEED
T5 - DECELERATION FROM CREEP SPEED TO ZERO

DIRECTION & COUNTS CALCULATION

* FORWARD:

V180 [ ] > V179 [ ]

* TOTAL COUNTS TO TRAVEL FORWARD:

V190 [ ] = V180 [ ] - V179 [ ]

* REMAINING COUNTS TO TRAVEL FORWARD:

V181 [ ] = V180 [ ] - V179 [ ]

* REVERSE:

V179 [ ] > V180 [ ]

* TOTAL COUNTS TO TRAVEL REVERSE:

V190 [ ] = V179 [ ] - V180 [ ]

* REMAINING COUNTS TO TRAVEL REVERSE:

V181 [ ] = V179 [ ] - V180 [ ]

* SHUT OFF FAST VALVE - DECEL TO CREEP SPEED:

V181 [ ] < V196 [ ]

* SHUT OFF SLOW VALVE - COAST TO STOP:

V181 [ ] < V197 [ ]

V179 - ACTUAL LOADER TREE POSITION (COUNTS)
V180 - COUNT # THAT LOADER TREE GOING TO (DESTINATION)
V181 - REMAINING COUNTS TO TRAVEL FOR LOADER TREE
V190 - TOTAL COUNTS TO TRAVEL
V196 - TOTAL CREEP COUNTS
V197 - # OF COUNTS FOR LOADER TREE TO COAST TO STOP

COUNTS # THAT LOADER GOING TO (DESTINATION):

* HOME POS. TO POS. # IN RACK:

V195 [ ]

* POS. # IN RACK TO HOME POS.:

V170 [ ]

* HOME POS. TO STACKER POS.:

V194 [ ]

* STACKER POS. TO HOME POS.:

V170 [ ]

→ V180 [ ]

LOADER TOTAL CREEP COUNTS:

* HOME POS. TO POS. # IN RACK:

V175 [ ]

* POS. # IN RACK TO HOME POS.:

V177 [ ]

* HOME POS. TO STACKER POS.:

V174 [ ]

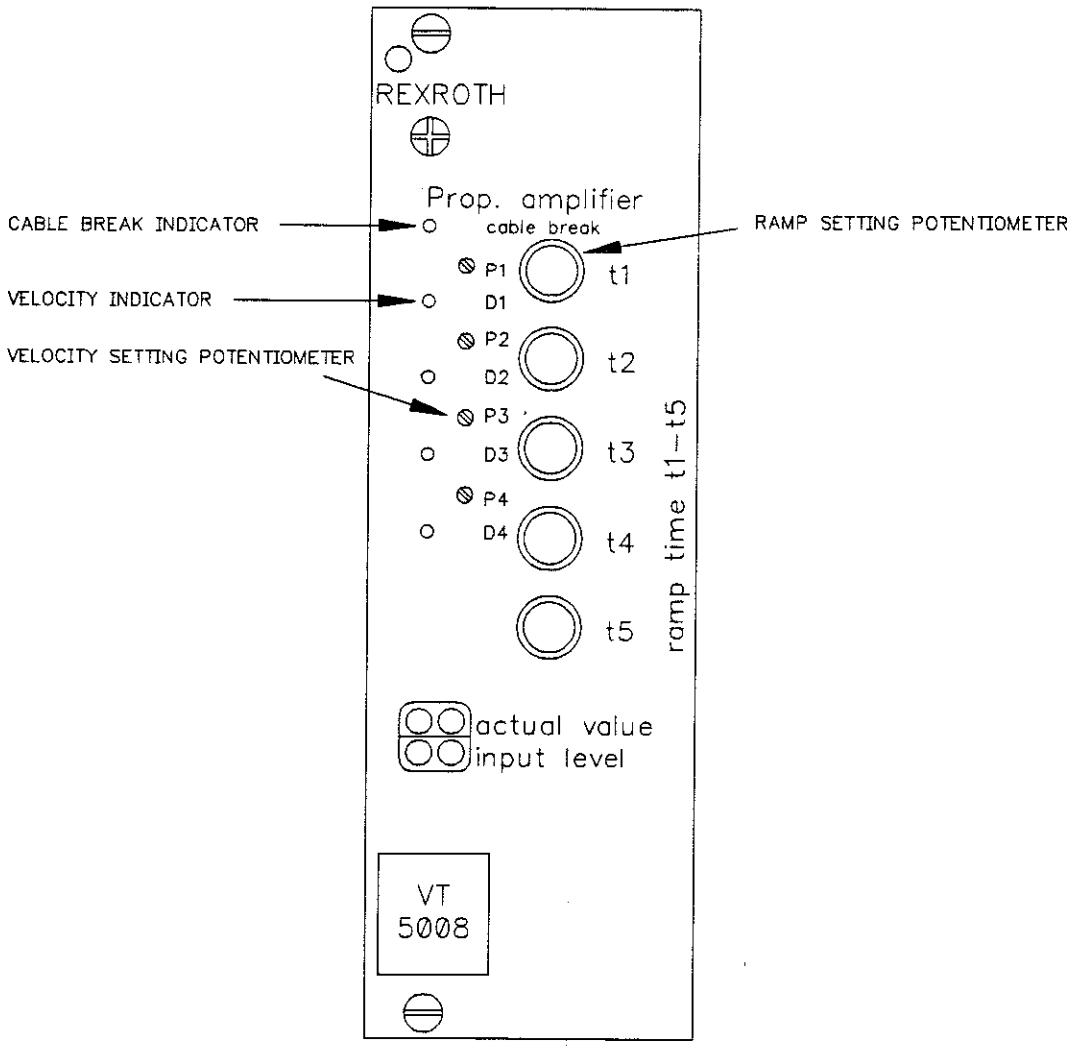
* STACKER POS. TO HOME POS.:

V176 [ ]

→ V196 [ ]

ELECTRONIC AMPLIFIER CARD VT-5008

FACE PLATE



⊘ VELOCITY SETTING POTENTIOMETERS

P1 – FORWARD SLOW OR CREEP SPEED
P2 – FORWARD FAST SPEED
P3 – REVERSE SLOW OR CREEP SPEED
P4 – REVERSE FAST SPEED

NOTE: A clockwise rotation of a pot will increase the Velocity set point.

○ LEDS for visual reference of which input relay is energized.

◯ RAMP SETTING POTENTIOMETERS

T2 – FORWARD ACCELERATION FROM Ø TO FAST SPEED
T1 – FORWARD DECELERATION FROM FAST TO CREEP SPEED
T4 – REVERSE ACCELERATION FROM Ø TO FAST SPEED
T3 – REVERSE DECELERATION FROM FAST TO CREEP SPEED
T5 – DECELERATION FROM CREEP TO Ø

NOTE: A clockwise rotation of a pot will increase the Ramp time.

LOADER ELECTRONIC AMPLIFIER CARD VT-5008

The Electronic Amplifier card Model VT 5008 converts an input voltage signal proportionally into output current to power proportional solenoids. Dependent on the amount of current to the solenoid, the force is proportionally transmitted to the valves. The VT 5008 electronic amplifier controls Model 4 WRE directional control valves with positional feedback.

The 24 Volts input voltage from the power supply on pin 22ac and 28ac powers the card and is also fed thru a voltage regulator which filters, suppresses and smooths the voltage and divides its 18 Volts output over pins 26a and 24a with reference potential to "measured zero" on pin 26c. From pins 26a and 24a the +9 Volts and -9 Volts is used as command input signals to the amplifier at pin 14c, 14a, 20c, 20a.

Pins 14c & 14a is connected to pin 26a which is +9 Volts and that is used for one direction. Pins 20c & 20a is connected to pin 24a which is -9 Volts and that is used for the other direction. **To change direction**, connect +9 volts on pin 26a to pin 20c & 20a and -9 volts on pin 24a to pin 14c & 14a respectively.

Pins 2c & 32c is connected to Solenoid "B". Pins 2a & 32a is connected to Solenoid "A". **These two cables should not be switched for the system to work properly.**

VELOCITY SETTING:

There are four (4) internal potentiometers on the face plate of the VT 5008 card located in the Loader panel which offers the setting of 4 velocity set points or the Fast and Slow speed of the Loader. These potentiometers are label as follows:

P1 - Forward slow or creep speed
P2 - Forward fast speed
P3 - Reverse slow or creep speed
P4 - Reverse fast speed

The reference voltages of +9 VDC and -9 VDC are provided to power the command set point potentiometers. The polarity of the signals control the direction of flow for the extend or retract cycles of the actuator. The maximum flow would be proportional to the magnitude of the potentiometer command set point.

In order to set the fast speed for both directions to the same set point, connect the Voltmeter to the test points on the face plate of the VT 5008 card. Manually energize relay CR2 (Fast Speed Forward Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to +6 volts. A clockwise rotation of the potentiometer will increase the setting value. On the other hand, energize relay CR4 (Fast Speed Reverse Relay) the value should be between 0 to -6 volts. Repeat the same procedure for the slow speed for both directions.

There are 4 associated LEDs on the face plate to permit fast visual reference of which input relay is energized.

Also, there is a cable break detector that continuously monitors the cable connection of the feedback. In the case of a cable break the valve "fails safe" removing power from the solenoid. A LED located on the face plate provides visual indication that the feedback wires or cable have been disconnected.

When the Loader accelerates, it energizes both the Fast & Slow outputs; however, if more than one (1) channel is selected, the channel with the highest number has priority.

For example:

If the Loader accelerates in the reverse direction, both P3 and P4 will be ON, but P4 will have priority over P3. Therefore, the Loader will accelerate to the velocity preset of P4. When the Loader completes all the Accel + Run counts P4 turns OFF. At this point, the Loader decelerates to the velocity preset of P3 which is the slow or creep speed.

RAMP SETTING:

There are five (5) potentiometers on the face plate of the VT-5008 that offers accessible ramp control for each individual input command. The ramp generator distributes a stepped input signal into a slowly increasing output signal over an adjustable time period. The time or "slope" of the output signal curve may be adjusted for both "up" and "down" ramps. Each preset P1 - P4 has a corresponding ramp time adjustment, T1 thru T4. These potentiometers are adjustable from the card face plate and allow signal vs. time ramping of up to 20 seconds. A clockwise rotation of a trim pot will increase the ramp time. When all of the preset relays are de-energized, ramp T5 controls the centering time of the valve.

T2 - Loader forward acceleration from 0 to fast speed
T1 - Loader forward deceleration from fast to creep speed

T4 - Loader reverse acceleration from 0 to fast speed
T3 - Loader reverse deceleration from fast to creep speed

T5 - Loader deceleration from creep speed to 0.

LOADER VELOCITY (SPEED) SETTING:

There are four (4) internal potentiometers on the face plate of the VT 5008 card located in the RTS Main Control Panel which offers the setting of 4 velocity set points or the Fast and Slow speed of the Loader. These potentiometers are label as follows:

P1 - Forward slow or creep speed
P2 - Forward fast speed
P3 - Reverse slow or creep speed
P4 - Reverse fast speed

In order to set the velocity (speed) for both direction, connect the Voltmeter to the test points (input value) on the face plate of the VT 5008 card.

* Forward slow or creep speed (0 to +6 volts):
  - Manually energize relay **CR1** (Forward Slow Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to +6 volts. A clockwise rotation of the potentiometer will increase the setting value. (Start with 1 Volt)

    P1: Loader Forward Slow _____ volts.

* Forward fast or top speed (0 to +6 volts):
  - Manually energize relay **CR2** (Forward Fast Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to +6 volts. A clockwise rotation of the potentiometer will increase the setting value. (Start with 3 Volts)

    P2: Loader Forward Fast _____ volts.

* Reverse slow or creep speed (0 to -6 volts):
  - Manually energize relay **CR3** (Reverse Slow Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to -6 volts. A clockwise rotation of the potentiometer will increase the setting value. (Start with -1 Volt)

    P3: Loader Reverse Slow _____ volts.

* Reverse fast or top speed (0 to -6 volts):
  - Manually energize relay **CR4** (Reverse Fast Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to -6 volts. A clockwise rotation of the potentiometer will increase the setting value. (Start with -3 Volts)

    P4: Loader Reverse Fast _____ volts.

LOADER ACCELERATION & DECELERATION (RAMP) SETTING:

There are five (5) potentiometers on the face plate of the VT-5008 that offers accessible ramp control for each individual input command. The ramp generator distributes a stepped input signal into a slowly increasing output signal over an adjustable time period. The time or "slope" of the output signal curve may be adjusted for both "up" and "down" ramps. Each preset P1 - P4 has a corresponding ramp time adjustment T1 thru T4. These potentiometers are adjustable from the card face plate and allow signal vs. time ramping of up to 20 second. A clockwise rotation of a trim pot will increase the ramp time. When all of the preset relays are de-energized, ramp T5 controls the centering time of the valve.

T2 - Loader forward acceleration from 0 to fast speed
T1 - Loader forward deceleration from fast to creep speed

T4 - Loader reverse acceleration from 0 to fast speed
T3 - Loader reverse deceleration from fast to creep speed

T5 - Loader deceleration from creep speed to 0.

In order to set the ramp rates for both direction, connect the Voltmeter to the test points (input value) on the face plate of the VT 5008 card. This procedure will be done after you already set the velocity (speed) set points for both direction.

* T2: Forward acceleration from 0 to fast speed:
  - Start the clock as you manually energize both relays **CR2** (Forward Fast Speed Relay) and **CR1** (Forward Slow Speed Relay) by pressing the red buttons on the top of the relays, the value on the Voltmeter should begin increasing from 0 to the fast speed set points. As soon as the value on the Voltmeter equal to your fast speed setting, stop the clock. That will be how long it takes to accelerate from 0 to fast speed. A clockwise rotation of the potentiometer will increase the setting value.

  T2: Loader Forward Acceleration _____ seconds.

* T1: Forward deceleration from fast to creep speed:
  - Start the clock as soon as you manually de-energized relay **CR2** (Forward Fast Speed Relay) by releasing the red button on the top of the relay 2, the value on the Ohmmeter should begin decreasing from the fast speed setting (volts) to slow speed setting (volts). As soon as the value on the Ohmmeter equal to your slow speed setting, stop the clock. That will be how long it takes to decelerate from fast to slow speed. A clockwise rotation of the potentiometer will increase the setting value.

  T1: Loader Forward Deceleration _____ seconds.

* T5: Deceleration from creep speed to 0:
  - Start the clock as soon as you manually de-energized relay **CR1** (Forward Slow Speed Relay) by releasing the red button on the top of the relay, the value on the Voltmeter should begin decreasing from the slow speed setting (volts) to 0. As soon as the value on the Voltmeter equal 0, stop the clock. That will be how long it takes to decelerate from slow speed to 0. A clockwise rotation of the potentiometer will increase the setting value.

T5: Loader Deceleration from creep to 0 _____ seconds.

* T4: Reverse acceleration from 0 to fast speed:
  - Start the clock as you manually energize both relays **CR4** (Reverse Fast Speed Relay) and **CR3** (Reverse Slow Speed Relay) by pressing the red buttons on the top of the relays, the value on the Voltmeter should begin increasing from 0 to the fast speed set points. As soon as the value on the Voltmeter equal to your fast speed setting, stop the clock. That will be how long it takes to accelerate from 0 to fast speed. A clockwise rotation of the potentiometer will increase the setting value.

T4: Loader Reverse Acceleration _____ seconds.

* T3: Reverse deceleration from fast to creep speed:
  - Start the clock as soon as you manually de-energized relay **CR4** (Reverse Fast Speed Relay) by releasing the red button on the top of the relay 4, the value on the Voltmeter should begin decreasing from the fast speed setting (volts) to slow speed setting (volts). As soon as the value on the Voltmeter equal to your slow speed setting, stop the clock. That will be how long it takes to decelerate from fast to slow speed. A clockwise rotation of the potentiometer will increase the setting value.

T3: Loader Reverse Deceleration _____ seconds.

LOADER LOCATION (COUNTS) SETTING

PASS NUMBER

# 1	# 2	# 3	# 4
V201	V202	V203	V204

ORIGIN

HOME POS.	STACKER
	1000
V170	V194

For the Loader, the origin is at the Stacker position. Therefore, the Stacker position will be the reference point or V194 = 1000.

- Reset the counter WX322 by pressing the "RESET" button on the Green Conveyor pushbutton station (WX322 = 0).

  For counts setting, Only RESET the Loader at the origin.

- Manually move the Loader spade tree to the next position by operating the Pallet Loader forward selector switch. WX322 should start increasing as soon as you move.

  1 count = 0.02356 in. One revolution = 800 counts = 6 * 3.1416

- When you get to the destination (Home position) and stoped (make sure the spade tree is on the Home position switch), the number in WX322 is the number of counts between the Stacker and the Home position. Since our Origin start with 1000, the Home position (V170) = WX322 + 1000.

- Continue moving the Loader spade tree to Pass # 1 and stoped (make sure the spade tree is on the Loader at Pos. 1 switch). Pass # 1 position (V201) = WX322 + 1000

- Repeat the same procedure until getting to the last pass or position 4.

- To double check, manually move the Loader spade tree in the opposite direction by operating the Pallet Loader reverse selector switch., WX322 should decreasing as soon as you move. When you get to the destination and stoped, WX322 should equal to the previous number at that position.

- When the Loader spade tree is at the stacker, WX322 should be zero.

LOADER COUNTS TABLE: FROM HOME POS. TO RACK

Pass #	# of counts
1	V201 =
2	V202 =
3	V203 =
4	V204 =

Loader Pass # Pointer V188

Counts to pos. Loader V195

This table represents the number of counts from the Home position to the Pallets position on the rack. The Value from this table will be moved into V180 according to the Loader Pass # pointer. Then, the value in V180 will be used in the program to determine which direction the Loader spade tree will travel.

LOADER CREEP COUNTS TABLE: FROM HOME POS. TO RACK

Pass #	# of counts
1	V401 =
2	V402 =
3	V403 =
4	V404 =

Loader Pass # Pointer V399

Creep cnt to pos. Loader V175

This table represents the number of creep counts from the Home position to the Pallets position on the rack. The Value from this table will be moved into V196 according to the Loader Pass # pointer. Then, the value in V196 will be used in the program to determine when to shut off the FAST valve and slow down to creep speed.

LOADER CREEP COUNTS TABLE: FROM RACK TO HOME POS.

Pass #	# of counts
1	V421 =
2	V422 =
3	V423 =
4	V424 =

Loader Pass # Pointer V419

Creep cnt to pos. Loader V177

This table represents the number of creep counts from the Pallets position on the rack to the Home position. The Value from this table will be moved into V196 according to the Loader Pass # pointer. Then, the value in V196 will be used in the program to determine when to shut off the FAST valve and slow down to creep speed.

COUNTS TABLE: LOADER

Stacker Position:

V194 =

Creep counts from Home pos. to Stacker Position:

V174 =

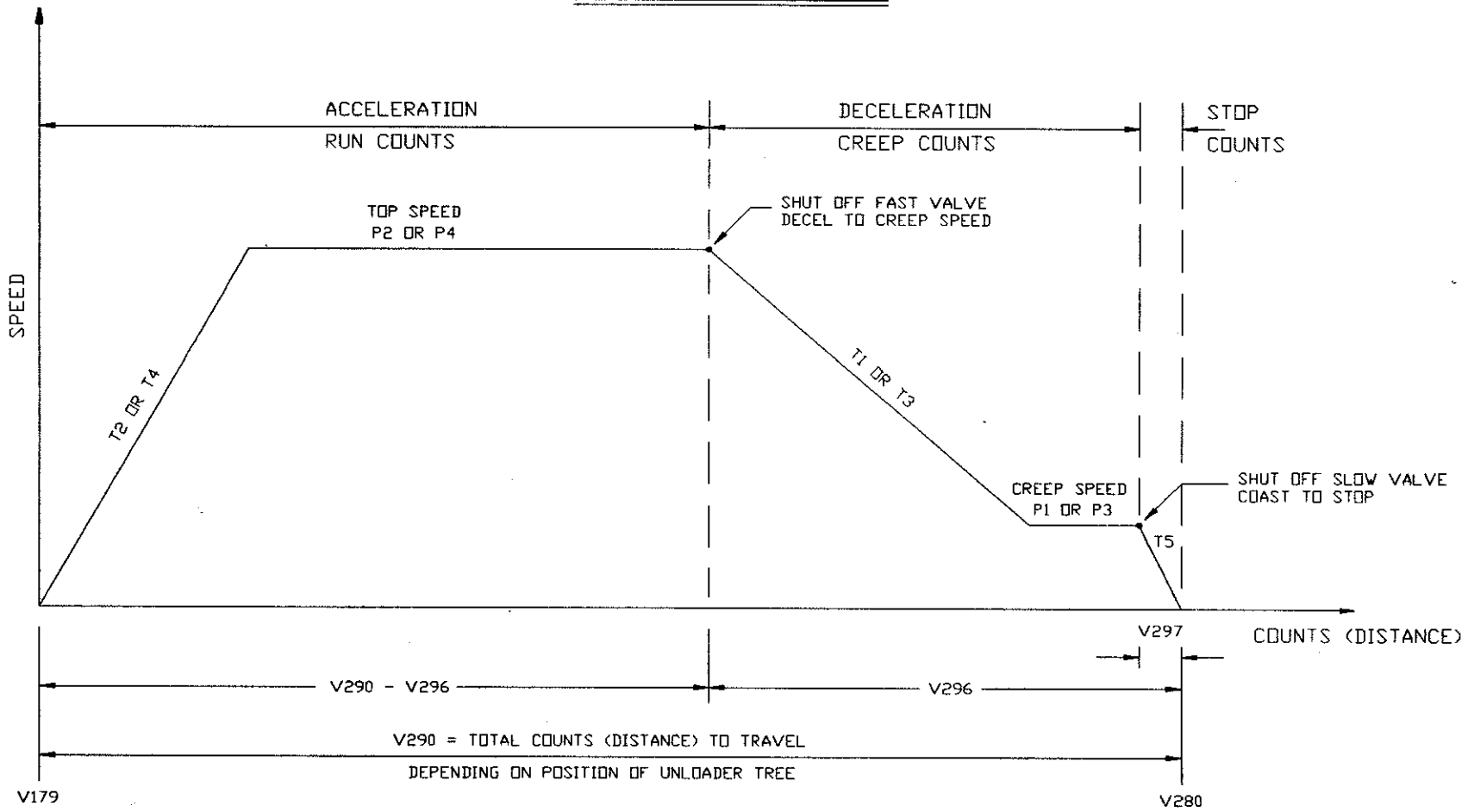
Home Position:

V170 =

Creep counts from Stacker Position to Home Position:

V176 =

UNLOADER TREE MOTION



V279 - ACTUAL UNLOADER TREE POSITION (COUNTS)
V280 - COUNT # THAT UNLOADER TREE GOING TO (DESTINATION)
V281 - REMAINING COUNTS TO TRAVEL FOR UNLOADER TREE
V290 - TOTAL COUNTS TO TRAVEL
V296 - TOTAL CREEP COUNTS
V297 - # OF COUNTS FOR UNLOADER TREE TO COAST TO STOP

P1 - FORWARD SLOW OR CREEP SPEED SETPOINT
P2 - FORWARD FAST OR TOP SPEED SETPOINT
P3 - REVERSE SLOW OR CREEP SPEED SETPOINT
P4 - REVERSE FAST OR TOP SPEED SETPOINT

T2 - FORWARD ACCELERATION FROM 0 TO TOP SPEED
T1 - FORWARD DECELERATION FROM TOP TO CREEP SPEED
T4 - REVERSE ACCELERATION FROM 0 TO TOP SPEED
T3 - REVERSE DECELERATION FROM TOP TO CREEP SPEED
T5 - DECELERATION FROM CREEP SPEED TO ZERO

DIRECTION & COUNTS CALCULATION

* FORWARD:

V280 [ ] > V279 [ ]

* TOTAL COUNTS TO TRAVEL FORWARD:

V290 [ ] = V280 [ ] - V279 [ ]

* REMAINING COUNTS TO TRAVEL FORWARD:

V281 [ ] = V280 [ ] - V279 [ ]

* REVERSE:

V279 [ ] > V280 [ ]

* TOTAL COUNTS TO TRAVEL REVERSE:

V290 [ ] = V279 [ ] - V280 [ ]

* REMAINING COUNTS TO TRAVEL REVERSE:

V281 [ ] = V279 [ ] - V280 [ ]

* SHUT OFF FAST VALVE - DECEL TO CREEP SPEED:

V281 [ ] < V296 [ ]

* SHUT OFF SLOW VALVE - COAST TO STOP:

V281 [ ] < V297 [ ]

V279 - ACTUAL UNLOADER TREE POSITION (COUNTS)
V280 - COUNT # THAT UNLOADER TREE GOING TO (DESTINATION)
V281 - REMAINING COUNTS TO TRAVEL FOR UNLOADER TREE
V290 - TOTAL COUNTS TO TRAVEL
V296 - TOTAL CREEP COUNTS
V297 - # OF COUNTS FOR UNLOADER TREE TO COAST TO STOP

COUNTS # THAT UNLOADER GOING TO (DESTINATION):

* HOME POS. TO POS. # IN RACK:

V193 [ ]

* POS. # IN RACK TO HOME POS.:

V270 [ ]

* HOME POS. TO UNSTACKER POS.:

V192 [ ]

* UNSTACKER POS. TO HOME POS.:

V270 [ ]

→ V280 [ ]

UNLOADER TOTAL CREEP COUNTS:

* HOME POS. TO POS. # IN RACK:

V173 [ ]

* POS. # IN RACK TO HOME POS.:

V178 [ ]

* HOME POS. TO UNSTACKER POS.:

V172 [ ]

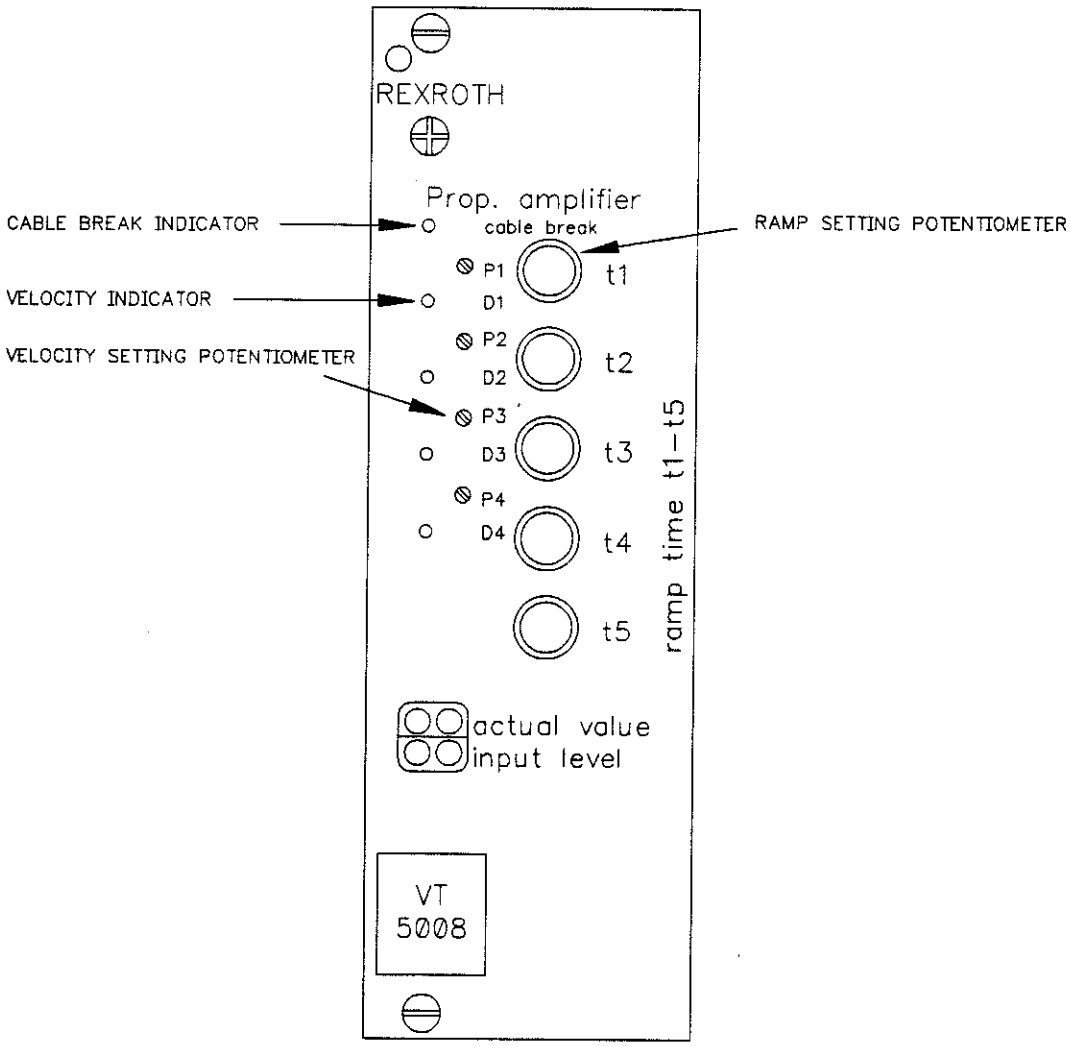
* UNSTACKER POS. TO HOME POS.:

V276 [ ]

→ V296 [ ]

ELECTRONIC AMPLIFIER CARD VT-5008

FACE PLATE



⊘ VELOCITY SETTING POTENTIOMETERS

P1 – FORWARD SLOW OR CREEP SPEED
P2 – FORWARD FAST SPEED
P3 – REVERSE SLOW OR CREEP SPEED
P4 – REVERSE FAST SPEED

NOTE: A clockwise rotation of a pot will increase the Velocity set point.

○ LEDS for visual reference of which input relay is energized.

◯ RAMP SETTING POTENTIOMETERS

T2 – FORWARD ACCELERATION FROM 0 TO FAST SPEED
T1 – FORWARD DECELERATION FROM FAST TO CREEP SPEED
T4 – REVERSE ACCELERATION FROM 0 TO FAST SPEED
T3 – REVERSE DECELERATION FROM FAST TO CREEP SPEED
T5 – DECELERATION FROM CREEP TO 0

NOTE: A clockwise rotation of a pot will increase the Ramp time.

UNLOADER ELECTRONIC AMPLIFIER CARD VT-5008

The Electronic Amplifier card Model VT 5008 converts an input voltage signal proportionally into output current to power proportional solenoids. Dependent on the amount of current to the solenoid, the force is proportionally transmitted to the valves. The VT 5008 electronic amplifier controls Model 4 WRE directional control valves with positional feedback.

The 24 Volts input voltage from the power supply on pin 22ac and 28ac powers the card and is also fed thru a voltage regulator which filters, suppresses and smooths the voltage and divides its 18 Volts output over pins 26a and 24a with reference potential to "measured zero" on pin 26c. From pins 26a and 24a the +9 Volts and -9 Volts is used as command input signals to the amplifier at pin 14c, 14a, 20c, 20a.

Pins 14c & 14a is connected to pin 26a which is +9 Volts and that is used for one direction. Pins 20c & 20a is connected to pin 24a which is -9 Volts and that is used for the other direction. **To change direction**, connect +9 volts on pin 26a to pin 20c & 20a and -9 volts on pin 24a to pin 14c & 14a respectively.

Pins 2c & 32c is connected to Solenoid "B". Pins 2a & 32a is connected to Solenoid "A". **These two cables should not be switched for the system to work properly.**

VELOCITY SETTING:

There are four (4) internal potentiometers on the face plate of the VT 5008 card located in the Unloader panel which offers the setting of 4 velocity set points or the Fast and Slow speed of the Unloader. These potentiometers are label as follows:

P1 - Forward slow or creep speed
P2 - Forward fast speed
P3 - Reverse slow or creep speed
P4 - Reverse fast speed

The reference voltages of +9 VDC and -9 VDC are provided to power the command set point potentiometers. The polarity of the signals control the direction of flow for the extend or retract cycles of the actuator. The maximum flow would be proportional to the magnitude of the potentiometer command set point.

In order to set the fast speed for both directions to the same set point, connect the Voltmeter to the test points on the face plate of the VT 5008 card. Manually energize relay CR6 (Fast Speed Forward Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to +6 volts. A clockwise rotation of the potentiometer will increase the setting value. On the other hand, energize relay CR8 (Fast Speed Reverse Relay) the value should be between 0 to -6 volts. Repeat the same procedure for the slow speed for both directions.

There are 4 associated LEDs on the face plate to permit fast visual reference of which input relay is energized.

Also, there is a cable break detector that continuously monitors the cable connection of the feedback. In the case of a cable break the valve "fails safe" removing power from the solenoid. A LED located on the face plate provides visual indication that the feedback wires or cable have been disconnected.

When the Unloader accelerates, it energizes both the Fast & Slow outputs; however, if more than one (1) channel is selected, the channel with the highest number has priority.

For example:

If the Unloader accelerates in the reverse direction, both P3 and P4 will be ON, but P4 will have priority over P3. Therefore, the Unloader will accelerate to the velocity preset of P4. When the Unloader completes all the Accel + Run counts P4 turns OFF. At this point, the Unloader decelerates to the velocity preset of P3 which is the slow or creep speed.

RAMP SETTING:

There are five (5) potentiometers on the face plate of the VT-5008 that offers accessible ramp control for each individual input command. The ramp generator distributes a stepped input signal into a slowly increasing output signal over an adjustable time period. The time or "slope" of the output signal curve may be adjusted for both "up" and "down" ramps. Each preset P1 - P4 has a corresponding ramp time adjustment, T1 thru T4. These potentiometers are adjustable from the card face plate and allow signal vs. time ramping of up to 20 seconds. A clockwise rotation of a trim pot will increase the ramp time. When all of the preset relays are de-energized, ramp T5 controls the centering time of the valve.

T2 - Unloader forward acceleration from 0 to fast speed
T1 - Unloader forward deceleration from fast to creep speed

T4 - Unloader reverse acceleration from 0 to fast speed
T3 - Unloader reverse deceleration from fast to creep speed

T5 - Unloader deceleration from creep speed to 0.

UNLOADER VELOCITY (SPEED) SETTING:

There are four (4) internal potentiometers on the face plate of the VT 5008 card located in the RTS Main Control Panel which offers the setting of 4 velocity set points or the Fast and Slow speed of the Unloader. These potentiometers are label as follows:

P1 - Forward slow or creep speed
P2 - Forward fast speed
P3 - Reverse slow or creep speed
P4 - Reverse fast speed

In order to set the velocity (speed) for both direction, connect the Voltmeter to the test points (input value) on the face plate of the VT 5008 card.

* Forward slow or creep speed (0 to +6 volts):
  - Manually energize relay **CR5** (Forward Slow Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to +6 volts. A clockwise rotation of the potentiometer will increase the setting value. (Start with 1 Volt)

    P1: Unloader Forward Slow _____ volts.

* Forward fast or top speed (0 to +6 volts):
  - Manually energize relay **CR6** (Forward Fast Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to +6 volts. A clockwise rotation of the potentiometer will increase the setting value. (Start with 3 Volts)

    P2: Unloader Forward Fast _____ volts.

* Reverse slow or creep speed (0 to -6 volts):
  - Manually energize relay **CR7** (Reverse Slow Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to -6 volts. A clockwise rotation of the potentiometer will increase the setting value. (Start with -1 Volt)

    P3: Unloader Reverse Slow _____ volts.

* Reverse fast or top speed (0 to -6 volts):
  - Manually energize relay **CR8** (Reverse Fast Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to -6 volts. A clockwise rotation of the potentiometer will increase the setting value. (Start with -3 Volts)

    P4: Unloader Reverse Fast _____ volts.

UNLOADER ACCELERATION & DECELERATION (RAMP) SETTING:

There are five (5) potentiometers on the face plate of the VT-5008 that offers accessible ramp control for each individual input command. The ramp generator distributes a stepped input signal into a slowly increasing output signal over an adjustable time period. The time or "slope" of the output signal curve may be adjusted for both "up" and "down" ramps. Each preset P1 - P4 has a corresponding ramp time adjustment T1 thru T4. These potentiometers are adjustable from the card face plate and allow signal vs. time ramping of up to 20 second. A clockwise rotation of a trim pot will increase the ramp time. When all of the preset relays are de-energized, ramp T5 controls the centering time of the valve.

T2 - Unloader forward acceleration from 0 to fast speed
T1 - Unloader forward deceleration from fast to creep speed

T4 - Unloader reverse acceleration from 0 to fast speed
T3 - Unloader reverse deceleration from fast to creep speed

T5 - Unloader deceleration from creep speed to 0.

In order to set the ramp rates for both direction, connect the Voltmeter to the test points (input value) on the face plate of the VT 5008 card. This procedure will be done after you already set the velocity (speed) set points for both direction.

* T2: Forward acceleration from 0 to fast speed:
  - Start the clock as you manually energize both relays **CR6** (Forward Fast Speed Relay) and **CR5** (Forward Slow Speed Relay) by pressing the red buttons on the top of the relays, the value on the Voltmeter should begin increasing from 0 to the fast speed set points. As soon as the value on the Voltmeter equal to your fast speed setting, stop the clock. That will be how long it takes to accelerate from 0 to fast speed. A clockwise rotation of the potentiometer will increase the setting value.

  T2: Unloader Forward Acceleration _____ seconds.

* T1: Forward deceleration from fast to creep speed:
  - Start the clock as soon as you manually de-energized relay **CR6** (Forward Fast Speed Relay) by releasing the red button on the top of the relay 2, the value on the Ohmmeter should begin decreasing from the fast speed setting (volts) to slow speed setting (volts). As soon as the value on the Ohmmeter equal to your slow speed setting, stop the clock. That will be how long it takes to decelerate from fast to slow speed. A clockwise rotation of the potentiometer will increase the setting value.

  T1: Unloader Forward Deceleration _____ seconds.

* T5: Deceleration from creep speed to 0:
  - Start the clock as soon as you manually de-energized relay **CR5** (Forward Slow Speed Relay) by releasing the red button on the top of the relay, the value on the Voltmeter should begin decreasing from the slow speed setting (volts) to 0. As soon as the value on the Voltmeter equal 0, stop the clock. That will be how long it takes to decelerate from slow speed to 0. A clockwise rotation of the potentiometer will increase the setting value.

T5: Unloader Deceleration from creep to 0 _____ seconds.

* T4: Reverse acceleration from 0 to fast speed:
  - Start the clock as you manually energize both relays **CR8** (Reverse Fast Speed Relay) and **CR7** (Reverse Slow Speed Relay) by pressing the red buttons on the top of the relays, the value on the Voltmeter should begin increasing from 0 to the fast speed set points. As soon as the value on the Voltmeter equal to your fast speed setting, stop the clock. That will be how long it takes to accelerate from 0 to fast speed. A clockwise rotation of the potentiometer will increase the setting value.

T4: Unloader Reverse Acceleration _____ seconds.

* T3: Reverse deceleration from fast to creep speed:
  - Start the clock as soon as you manually de-energized relay **CR8** (Reverse Fast Speed Relay) by releasing the red button on the top of the relay 4, the value on the Voltmeter should begin decreasing from the fast speed setting (volts) to slow speed setting (volts). As soon as the value on the Voltmeter equal to your slow speed setting, stop the clock. That will be how long it takes to decelerate from fast to slow speed. A clockwise rotation of the potentiometer will increase the setting value.

T3: Unloader Reverse Deceleration _____ seconds.

UNLOADER LOCATION (COUNTS) SETTING

PASS NUMBER

# 4	# 3	# 2	# 1
V244	V243	V242	V241

ORIGIN

HOME POS.	UNSTACKER
	1000
V270	V192

For the Unloader, the origin is at the Unstacker position. Therefore, the Unstacker position will be the reference point or V192 = 1000.

- Reset the counter WX323 by pressing the "RESET" button on the Block & Pallet Return Conveyor pushbutton station. (WX323 = 0).

  For counts setting, Only RESET the Unloader at the origin.

- Manually move the Unloader spade tree to the next position by operating the Pallet Unloader forward selector switch. WX323 should start increasing as soon as you move.

  1 count = 0.02356 in. One revolution = 800 counts = 6 * 3.1416

- When you get to the destination (Home position) and stoped (make sure the spade tree is on the Home position switch), the number in WX323 is the number of counts between the Stacker and the Home position. Since our Origin start with 1000, the Home position (V170) = WX323 + 1000.

- Continue moving the Unloader spade tree to Pass # 1 and stoped (make sure the spade tree is on the Unloader at Pos. 1 switch). Pass # 1 position (V241) = WX323 + 1000

- Repeat the same procedure until getting to the last pass or position 4.

- To double check, manually move the Unloader spade tree in the opposite direction by operating the Pallet Unloader reverse selector switch., WX323 should decreasing as soon as you move. When you get to the destination and stoped, WX323 should equal to the previous number at that position.

- When the Unloader spade tree is at the Unstacker, WX323 should be zero.

UNLOADER CREEP COUNTS TABLE: FROM RACK TO HOME POS.

Pass #	# of counts
1	V461 =
2	V462 =
3	V463 =
4	V464 =

Unloader Pass # Pointer V459

Creep cnt to pos. Unlder V178

This table represents the number of creep counts from the Pallets position on the rack to the Home position. The Value from this table will be moved into V196 according to the Loader Pass # pointer. Then, the value in V196 will be used in the program to determine when to shut off the FAST valve and slow down to creep speed.

COUNTS TABLE: UNLOADER

Unstacker Position:

V192 =

Creep counts from Home pos. to Unstacker Position:

V172 =

Unloader Home Position:

V270 =

Creep counts from Unstacker Position to Home Position:

V276 =

UNLOADER COUNTS TABLE: FROM HOME POS. TO RACK

Pass #	# of counts
1	V241 =
2	V242 =
3	V243 =
4	V244 =

Unloader Pass # Pointer V189

Counts to pos. Unloader V193

This table represents the number of counts from the Home position to the Pallets position on the rack. The Value from this table will be moved into V180 according to the Unloader Pass # pointer. Then, the value in V180 will be used in the program to determine which direction the Unloader spade tree will travel.

UNLOADER CREEP COUNTS TABLE: FROM HOME POS. TO RACK

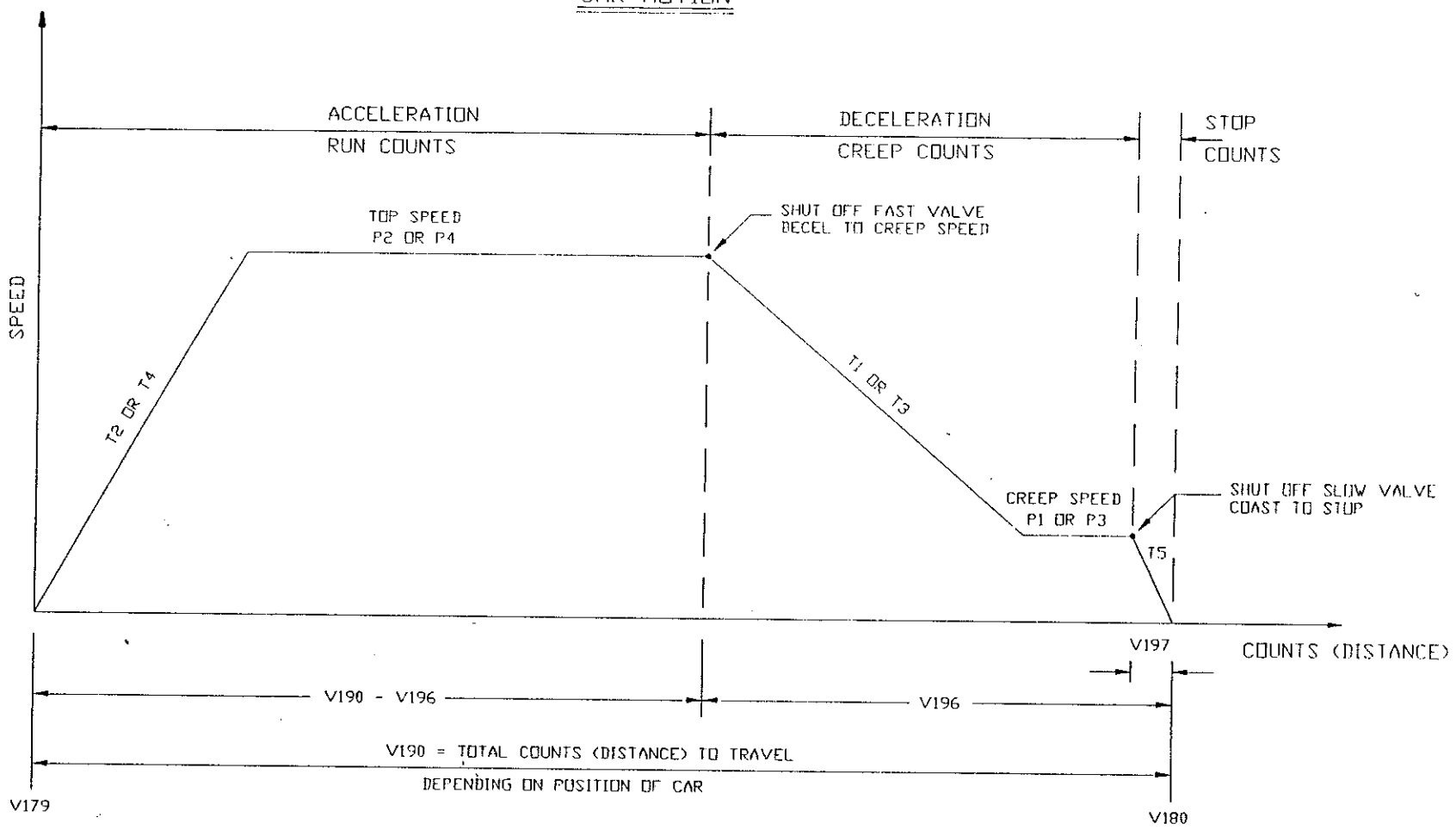
Pass #	# of counts
1	V441 =
2	V442 =
3	V443 =
4	V444 =

Unloader Pass # Pointer V439

Creep cnt to pos. Unlder V173

This table represents the number of creep counts from the Home position to the Pallets position on the rack. The Value from this table will be moved into V196 according to the Loader Pass # pointer. Then, the value in V196 will be used in the program to determine when to shut off the FAST valve and slow down to creep speed.

CAR MOTION



V179 - ACTUAL CAR POSITION (COUNTS)
V180 - COUNT # THAT CAR GOING TO (DESTINATION)
V181 - REMAINING COUNTS TO TRAVEL FOR CAR
V190 - TOTAL COUNTS TO TRAVEL
V196 - TOTAL CREEP COUNTS
V197 - # OF COUNTS FOR CAR TO COAST TO STOP

P1 - FORWARD SLOW OR CREEP SPEED SETPOINT
P2 - FORWARD FAST OR TOP SPEED SETPOINT
P3 - REVERSE SLOW OR CREEP SPEED SETPOINT
P4 - REVERSE FAST OR TOP SPEED SETPOINT

T2 - FORWARD ACCELERATION FROM 0 TO TOP SPEED
T1 - FORWARD DECELERATION FROM TOP TO CREEP SPEED
T4 - REVERSE ACCELERATION FROM 0 TO TOP SPEED
T3 - REVERSE DECELERATION FROM TOP TO CREEP SPEED
T5 - DECELERATION FROM CREEP SPEED TO ZERO

DIRECTION & COUNTS CALCULATION

* FORWARD:

V180 [ ] > V179 [ ]

* TOTAL COUNTS TO TRAVEL FORWARD:

V190 [ ] = V180 [ ] - V179 [ ]

* REMAINING COUNTS TO TRAVEL FORWARD:

V181 [ ] = V180 [ ] - V179 [ ]

* REVERSE:

V179 [ ] > V180 [ ]

* TOTAL COUNTS TO TRAVEL REVERSE:

V190 [ ] = V179 [ ] - V180 [ ]

* REMAINING COUNTS TO TRAVEL REVERSE:

V181 [ ] = V179 [ ] - V180 [ ]

* SHUT OFF FAST VALVE - DECEL TO CREEP SPEED:

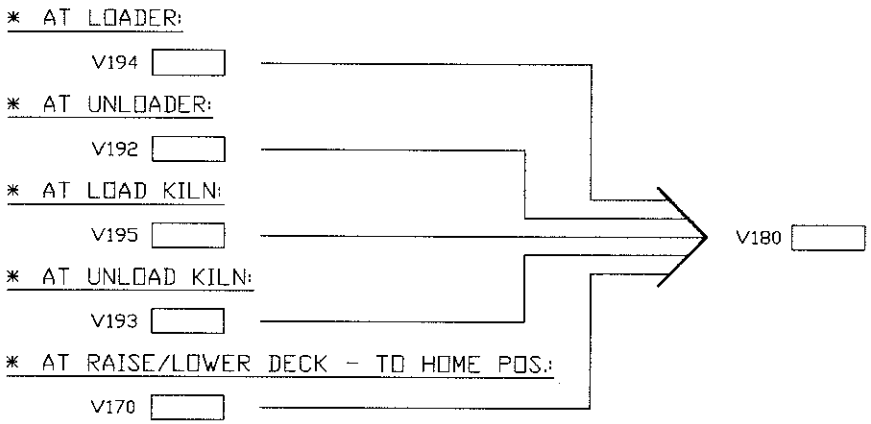
V181 [ ] < V196 [ ]

* SHUT OFF SLOW VALVE - COAST TO STOP:

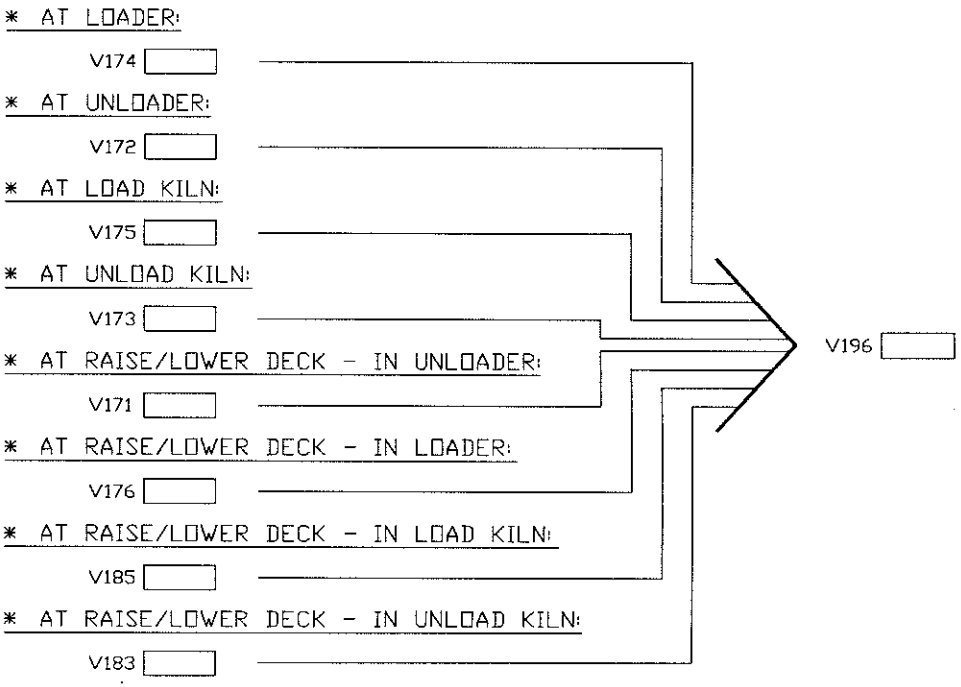
V181 [ ] < V197 [ ]

V179 - ACTUAL CAR POSITION (COUNTS)
V180 - COUNT # THAT CAR GOING TO (DESTINATION)
V181 - REMAINING COUNTS TO TRAVEL FOR CAR
V190 - TOTAL COUNTS TO TRAVEL
V196 - TOTAL CREEP COUNTS
V197 - # OF COUNTS FOR CAR TO COAST TO STOP

COUNTS # THAT UPCAR GOING TO (DESTINATION):

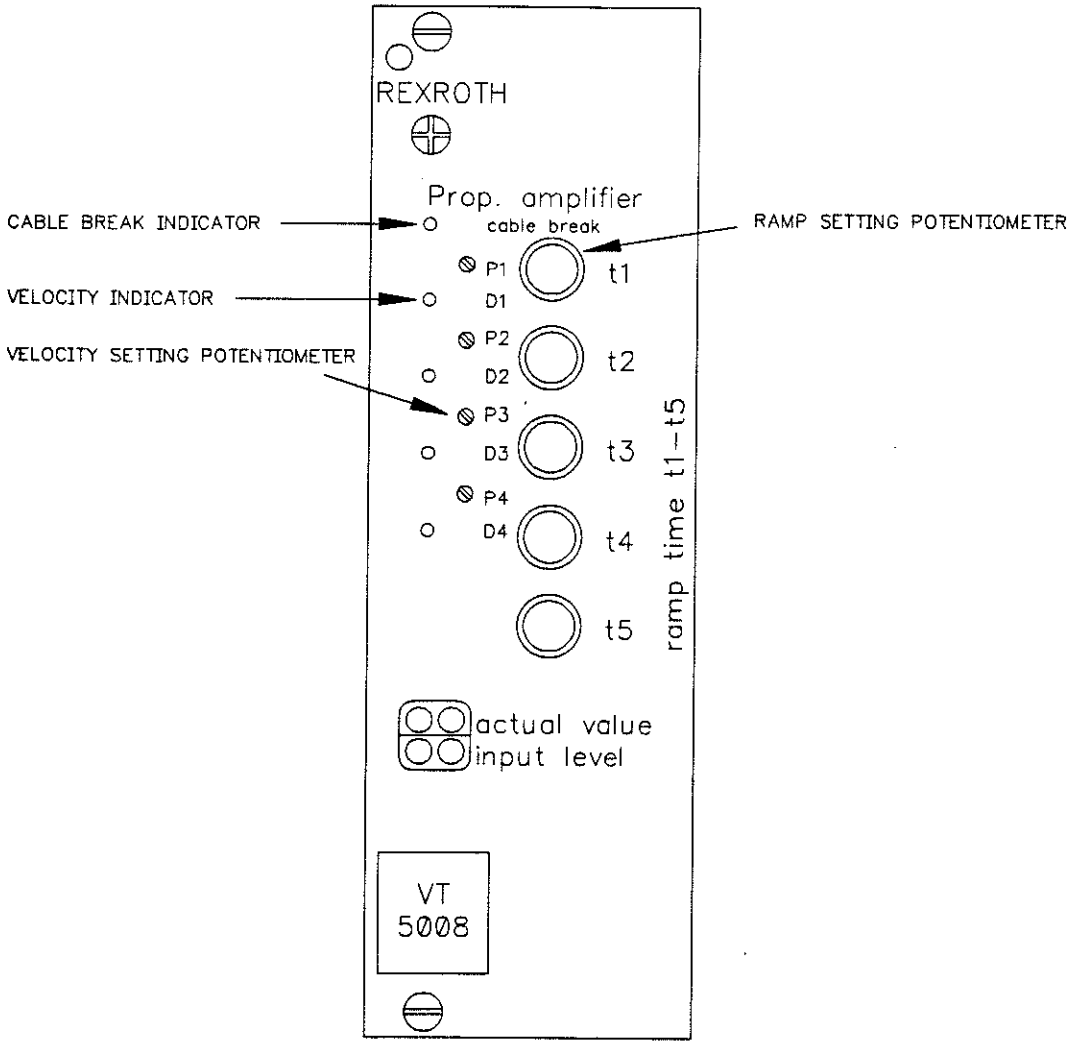


UPCAR TOTAL CREEP COUNTS:



ELECTRONIC AMPLIFIER CARD VT-5008

FACE PLATE



⊘ VELOCITY SETTING POTENTIOMETERS

P1 – FORWARD SLOW OR CREEP SPEED
P2 – FORWARD FAST SPEED
P3 – REVERSE SLOW OR CREEP SPEED
P4 – REVERSE FAST SPEED

NOTE: A clockwise rotation of a pot will increase the Velocity set point.

○ LEDS for visual reference of which input relay is energized.

◯ RAMP SETTING POTENTIOMETERS

T2 – FORWARD ACCELERATION FROM 0 TO FAST SPEED
T1 – FORWARD DECELERATION FROM FAST TO CREEP SPEED
T4 – REVERSE ACCELERATION FROM 0 TO FAST SPEED
T3 – REVERSE DECELERATION FROM FAST TO CREEP SPEED
T5 – DECELERATION FROM CREEP TO 0

NOTE: A clockwise rotation of a pot will increase the Ramp time.

LOCAR ELECTRONIC AMPLIFIER CARD VT-5008

The Electronic Amplifier card Model VT 5008 converts an input voltage signal proportionally into output current to power proportional solenoids. Dependent on the amount of current to the solenoid, the force is proportionally transmitted to the valves. The VT 5008 electronic amplifier controls Model 4 WRE directional control valves with positional feedback.

The 24 Volts input voltage from the power supply on pin 22ac and 28ac powers the card and is also fed thru a voltage regulator which filters, suppresses and smooths the voltage and divides its 18 Volts output over pins 26a and 24a with reference potential to "measured zero" on pin 26c. From pins 26a and 24a the +9 Volts and -9 Volts is used as command input signals to the amplifier at pin 14c, 14a, 20c, 20a.

Pins 14c & 14a is connected to pin 26a which is +9 Volts and that is used for one direction. Pins 20c & 20a is connected to pin 24a which is -9 Volts and that is used for the other direction. **To change direction**, connect +9 volts on pin 26a to pin 20c & 20a and -9 volts on pin 24a to pin 14c & 14a respectively.

Pins 2c & 32c is connected to Solenoid "B". Pins 2a & 32a is connected to Solenoid "A". **These two cables should not be switched for the system to work properly.**

VELOCITY SETTING:

There are four (4) internal potentiometers on the face plate of the VT 5008 card located in the Locar panel which offers the setting of 4 velocity set points or the Fast and Slow speed of the Locar. These potentiometers are label as follows:

P1 - Forward slow or creep speed
P2 - Forward fast speed
P3 - Reverse slow or creep speed
P4 - Reverse fast speed

The reference voltages of +9 VDC and -9 VDC are provided to power the command set point potentiometers. The polarity of the signals control the direction of flow for the extend or retract cycles of the actuator. The maximum flow would be proportional to the magnitude of the potentiometer command set point.

In order to set the fast speed for both directions to the same set point, connect the Voltmeter to the test points on the face plate of the VT 5008 card. Manually energize relay CR2 (Fast Speed Forward Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to +6 volts. A clockwise rotation of the potentiometer will increase the setting value. On the other hand, energize relay CR4 (Fast Speed Reverse Relay) the value should be between 0 to -6 volts. Repeat the same procedure for the slow speed for both directions.

There are 4 associated LEDs on the face plate to permit fast visual reference of which input relay is energized.

Also, there is a cable break detector that continuously monitors the cable connection of the feedback. In the case of a cable break the valve "fails safe" removing power from the solenoid. A LED located on the face plate provides visual indication that the feedback wires or cable have been disconnected.

When the Locar accelerates, it energizes both the Fast & Slow outputs; however, if more than one (1) channel is selected, the channel with the highest number has priority.

For example:

If the Locar accelerates in the reverse direction, both P3 and P4 will be ON, but P4 will have priority over P3. Therefore, the Locar will accelerate to the velocity preset of P4. When the Locar completes all the Accel + Run counts, P4 turns OFF. At this point, the Locar decelerates to the velocity preset of P3 which is the slow or creep speed.

RAMP SETTING:

There are five (5) potentiometers on the face plate of the VT-5008 that offers accessible ramp control for each individual input command. The ramp generator distributes a stepped input signal into a slowly increasing output signal over an adjustable time period. The time or "slope" of the output signal curve may be adjusted for both "up" and "down" ramps. Each preset P1 - P4 has a corresponding ramp time adjustment, T1 thru T4. These potentiometers are adjustable from the card face plate and allow signal vs. time ramping of up to 20 seconds. A clockwise rotation of a trim pot will increase the ramp time. When all of the preset relays are de-energized, ramp T5 controls the centering time of the valve.

T2 - Locar forward acceleration from 0 to fast speed
T1 - Locar forward deceleration from fast to creep speed

T4 - Locar reverse acceleration from 0 to fast speed
T3 - Locar reverse deceleration from fast to creep speed

T5 - Locar deceleration from creep speed to 0.

LOCAR VELOCITY (SPEED) SETTING:

There are four (4) internal potentiometers on the face plate of the VT 5008 card located in the Locar panel which offers the setting of 4 velocity set points or the Fast and Slow speed of the Car. These potentiometers are label as follows:

P1 - Forward slow or creep speed
P2 - Forward fast speed
P3 - Reverse slow or creep speed
P4 - Reverse fast speed

In order to set the velocity (speed) for both direction, connect the Voltmeter to the test points (input value) on the face plate of the VT 5008 card.

* Forward slow or creep speed (0 to +6 volts):
  - Manually energize relay **CR1** (Forward Slow Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to +6 volts. A clockwise rotation of the potentiometer will increase the setting value. (Start with 1 Volt)

    P1: Locar Forward Slow _____ volts.

* Forward fast or top speed (0 to +6 volts):
  - Manually energize relay **CR2** (Forward Fast Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to +6 volts. A clockwise rotation of the potentiometer will increase the setting value. (Start with 3 Volts)

    P2: Locar Forward Fast _____ volts.

* Reverse slow or creep speed (0 to -6 volts):
  - Manually energize relay **CR3** (Reverse Slow Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to -6 volts. A clockwise rotation of the potentiometer will increase the setting value. (Start with -1 Volt)

    P3: Locar Reverse Slow _____ volts.

* Reverse fast or top speed (0 to -6 volts):
  - Manually energize relay **CR4** (Reverse Fast Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to -6 volts. A clockwise rotation of the potentiometer will increase the setting value. (Start with -3 Volts)

    P4: Locar Reverse Fast _____ volts.

LOCAR ACCELERATION & DECELERATION (RAMP) SETTING:

There are five (5) potentiometers on the face plate of the VT-5008 that offers accessible ramp control for each individual input command. The ramp generator distributes a stepped input signal into a slowly increasing output signal over an adjustable time period. The time or "slope" of the output signal curve may be adjusted for both "up" and "down" ramps. Each preset P1 - P4 has a corresponding ramp time adjustment T1 thru T4. These potentiometers are adjustable from the card face plate and allow signal vs. time ramping of up to 20 second. A clockwise rotation of a trim pot will increase the ramp time. When all of the preset relays are de-energized, ramp T5 controls the centering time of the valve.

T2 - Locar forward acceleration from 0 to fast speed
T1 - Locar forward deceleration from fast to creep speed

T4 - Locar reverse acceleration from 0 to fast speed
T3 - Locar reverse deceleration from fast to creep speed

T5 - Locar deceleration from creep speed to 0.

In order to set the ramp rates for both direction, connect the Voltmeter to the test points (input value) on the face plate of the VT 5008 card. This procedure will be done after you already set the velocity (speed) set points for both direction.

* T2: Forward acceleration from 0 to fast speed:
  - Start the clock as you manually energize both relays **CR2** (Forward Fast Speed Relay) and **CR1** (Forward Slow Speed Relay) by pressing the red buttons on the top of the relays, the value on the Voltmeter should begin increasing from 0 to the fast speed set points. As soon as the value on the Voltmeter equal to your fast speed setting, stop the clock. That will be how long it takes to accelerate from 0 to fast speed. A clockwise rotation of the potentiometer will increase the setting value.

    T2: Locar Forward Acceleration _____ seconds.

* T1: Forward deceleration from fast to creep speed:
  - Start the clock as soon as you manually de-energized relay **CR2** (Forward Fast Speed Relay) by releasing the red button on the top of the relay 2, the value on the Ohmmeter should begin decreasing from the fast speed setting (volts) to slow speed setting (volts). As soon as the value on the Ohmmeter equal to your slow speed setting, stop the clock. That will be how long it takes to decelerate from fast to slow speed. A clockwise rotation of the potentiometer will increase the setting value.

    T1: Locar Forward Deceleration _____ seconds.

* T5: Deceleration from creep speed to 0:
  - Start the clock as soon as you manually de-energized relay **CR1** (Forward Slow Speed Relay) by releasing the red button on the top of the relay, the value on the Voltmeter should begin decreasing from the slow speed setting (volts) to 0. As soon as the value on the Voltmeter equal 0, stop the clock. That will be how long it takes to decelerate from slow speed to 0. A clockwise rotation of the potentiometer will increase the setting value.

  T5: Locar Deceleration from creep to 0 _____ seconds.

* T4: Reverse acceleration from 0 to fast speed:
  - Start the clock as you manually energize both relays **CR4** (Reverse Fast Speed Relay) and **CR3** (Reverse Slow Speed Relay) by pressing the red buttons on the top of the relays, the value on the Voltmeter should begin increasing from 0 to the fast speed set points. As soon as the value on the Voltmeter equal to your fast speed setting, stop the clock. That will be how long it takes to accelerate from 0 to fast speed. A clockwise rotation of the potentiometer will increase the setting value.

  T4: Locar Reverse Acceleration _____ seconds.

* T3: Reverse deceleration from fast to creep speed:
  - Start the clock as soon as you manually de-energized relay **CR4** (Reverse Fast Speed Relay) by releasing the red button on the top of the relay 4, the value on the Voltmeter should begin decreasing from the fast speed setting (volts) to slow speed setting (volts). As soon as the value on the Voltmeter equal to your slow speed setting, stop the clock. That will be how long it takes to decelerate from fast to slow speed. A clockwise rotation of the potentiometer will increase the setting value.

  T3: Locar Reverse Deceleration _____ seconds.

LOCAR LOCATION (COUNTS) SETTING

LOCAR

LOADER BETWEEN UNLOADER & KILNS

ORIGIN *KILN NO.*

UNLOADER	LOADER	1	2	3	4	5	6	7	8	9	10	11	12
1000													
V192	V194	V201	V202	V203	V204	V205	V206	V207	V208	V209	V210	V211	V212

For this plant layout, the origin of the Locar is at the Unloader. Therefore, the Unloader position will be the reference point or V192 = 1000.

- Reset the counter WX66 by pressing the "RESET" button on the Locar TI Control Panel (WX66 = 0). **For counts setting, only RESET the Locar at the origin.**
- Manually move the Locar to the next position by operating the pendant. WX66 should start increasing as soon as you move.

  1 count = 0.06283 in. One revolution = 400 counts = 6 * 3.1416
- When you get to the destination (Loader) and docked, the number in WX66 is the number of counts between the Unloader and the Loader. Since our Origin start with 1000, the Loader position (V194) = WX66 + 1000.
- Continue moving the Locar to kiln 1 and docked. Kiln 1 position (V201) = WX66 + 1000
- Repeat the same procedure until getting to the last kiln.
- To double check, manually move the Locar in the opposite direction, WX66 should decreasing as soon as you move. When you get to the destination and docked, WX66 should equal to the previous number at that position.
- When the Locar is at the Unloader, WX66 should be zero.

LOCAR LOCATION (COUNTS) SETTING

LOCAR

UNLOADER BETWEEN LOADER & KILNS

ORIGIN *KILN NO.*

LOADER	UNLOADER	1	2	3	4	5	6	7	8	9	10	11	12
1000													
V194	V192	V201	V202	V203	V204	V205	V206	V207	V208	V209	V210	V211	V212

For this plant layout, the origin of the Locar is at the Loader. Therefore, the Loader position will be the reference point or V194 = 1000.

- Reset the counter WX66 by pressing the "RESET" button on the Locar TI Control Panel (WX66 = 0). **For counts setting, only RESET the Locar at the origin.**
- Manually move the Locar to the next position by operating the pendant. WX66 should start increasing as soon as you move.

  1 count = 0.06283 in. One revolution = 400 counts = 6 * 3.1416
- When you get to the destination (Unloader) and docked, the number in WX66 is the number of counts between the Loader and the Unloader. Since our Origin start with 1000, the Unloader position (V192) = WX66 + 1000.
- Continue moving the Locar to kiln 1 and docked. Kiln 1 position (V201) = WX66 + 1000
- Repeat the same procedure until getting to the last kiln.
- To double check, manually move the Locar in the opposite direction, WX66 should decreasing as soon as you move. When you get to the destination and docked, WX66 should equal to the previous number at that position.
- When the Locar is at the Loader, WX66 should be zero.

LOCAR COUNTS SETTING GUIDE

The Locar is accelerated to the set maximum speed and allowed to travel until it is at a "preset" distance (V196 - desired creep distance) from the desired location. Then the Locar begins to decelerate to the set minimum speed and travel at this speed until it is at a desired distance for the car to stop (V197).

V179 - Actual Locar position (represented by count)

V180 - Destination that Locar going to (represented by count)

V181 - Remaining counts for Locar to travel

V196 - Desired creep distance (represented by count)

V197 - Desired distance for Locar to decel to 0 (by count)

To insure that the Locar will not dock at the wrong position (Loader, Unloader, or kilns) and try to enter, a fixed distance window is generated from the destination that car going to. If the car does not come to stop within this "window", the docking device will not be allowed to operate, and Alarm will turn on after the Car problem timer preset timed out.

This is the most important reason that the actual distance figures determine at installation SHOULD NOT BE ALTERED.

Note that the DESIRED CREEP DISTANCE can not be set to a value equal to or greater than the distance between the actual car position and the destination that car going to. If this occurs, a negative setting is produced and the car will not move.

Also, the DESIRED CREEP DISTANCE should be long enough for the car to decelerate smoothly from fast to creep speed without forcing the pump or over shoot the destination. However, if that distance is reached before the car has had time to reach the top speed setting, acceleration will be terminated and the car will decel toward creep speed.

LOCAR COUNTS TABLE: LOADER & UNLOADER

Unloader Position:

V192 =

Creep counts from Loader to Unloader (Bypass Option):

V311 =

Loader Position:

V194 =

Creep counts from Unloader to Loader:

V310 =

Counts needed for car to decel from creep to zero:

V197 = 5

(Normally 5 to 10 counts)

LOCAR COUNTS TABLE: FROM ORIGIN TO KILNS

Kiln #	# of counts
1	V201 =
2	V202 =
3	V203 =
4	V204 =
5	V205 =
6	V206 =
7	V207 =
8	V208 =
9	V209 =
10	V210 =
11	V211 =
12	V212 =

Load Kiln Pointer V188

Unload Kiln Pointer V189

Counts to Load Kiln V195

Counts to Unload Kiln V193

This table represents the number of counts from the ORIGIN (Loader or Unloader) position to the kilns position. The Value from this table will be moved into V195 and V193 according to the LK and UK pointer. Then, the value in V195 and V193 will be used in the program to determine which direction the Locar will travel.

LOCAR CREEP COUNTS TABLE: FROM LOADER TO LOAD KILN

Kiln #	# of counts
1	V401 =
2	V402 =
3	V403 =
4	V404 =
5	V405 =
6	V406 =
7	V407 =
8	V408 =
9	V409 =
10	V410 =
11	V411 =
12	V412 =

Load Kiln Pointer V399

Load Kiln number V548

No. of creep counts V307

This table represents the number of creep counts from the Loader position to the load kiln position. The Value from this table will be moved into V307 according to the LK pointer. Then, the value in V307 will be used in the program (V196) to determine when to shut off the FAST valve and slows down to creep speed.

LOCAR CREEP COUNTS TABLE: FROM LK TO UK

|LK – UK|	**# of counts**
1	V431 =
2	V432 =
3	V433 =
4	V434 =
5	V435 =
6	V436 =
7	V437 =
8	V438 =
9	V439 =
10	V440 =
11	V441 =
12	V442 =

\|LK – UK\| Pointer V429

\|LK – UK\| no. V511

No. of creep counts V308

This table represents the number of creep counts between the Load Kiln position and the Unload Kiln position. The Value from this table will be moved into V308 according to the **|LK – UK|** pointer. Then, the value in V308 will be used in the program (V196) to determine when to shut off the FAST valve and slows down to creep speed.

LOCAR CREEP COUNTS TABLE: FROM UK TO UNLOADER

Kiln #	# of counts
1	V461 =
2	V462 =
3	V463 =
4	V464 =
5	V465 =
6	V466 =
7	V467 =
8	V468 =
9	V469 =
10	V470 =
11	V471 =
12	V472 =

Unload Kiln Pointer V459

Unload Kiln no. V549

No. of creep counts V309

This table represents the number of creep counts between the Unload Kiln position and the Unloader position. The Value from this table will be moved into V309 according to the Unload Kiln pointer. Then, the value in V309 will be used in the program (V196) to determine when to shut off the FAST valve and slows down to creep speed.

ALARM TABLE FOR UPCAR AT LOAD KILN

Pass #	Timer
1	V601 =
2	V602 =
3	V603 =
4	V604 =
5	V605 =
6	V606 =
7	V607 =
8	V608 =
9	V609 =
10	V610 =
11	V611 =
12	V612 =

LK Pass # Pointer V599

Temp location for Alarm V598

This alarm table represents how long the upcar will take to go into the load kiln to deposit a rack. This table will change if you rearrange the rack location. The Value from this table will be moved into V598 according to the LK pass number pointer, V599. Then, the value in V598 will be moved into TMR 9 in the program and TMR 9 will start as soon as the Upcar gets off the Upcar on Locar switch. If the Upcar is not getting back onto the Locar in the set amount of time, the alarm will turn on to notify the operator. (600 = 60.0 sec.)

ALARM TABLE FOR UPCAR AT UNLOAD KILN

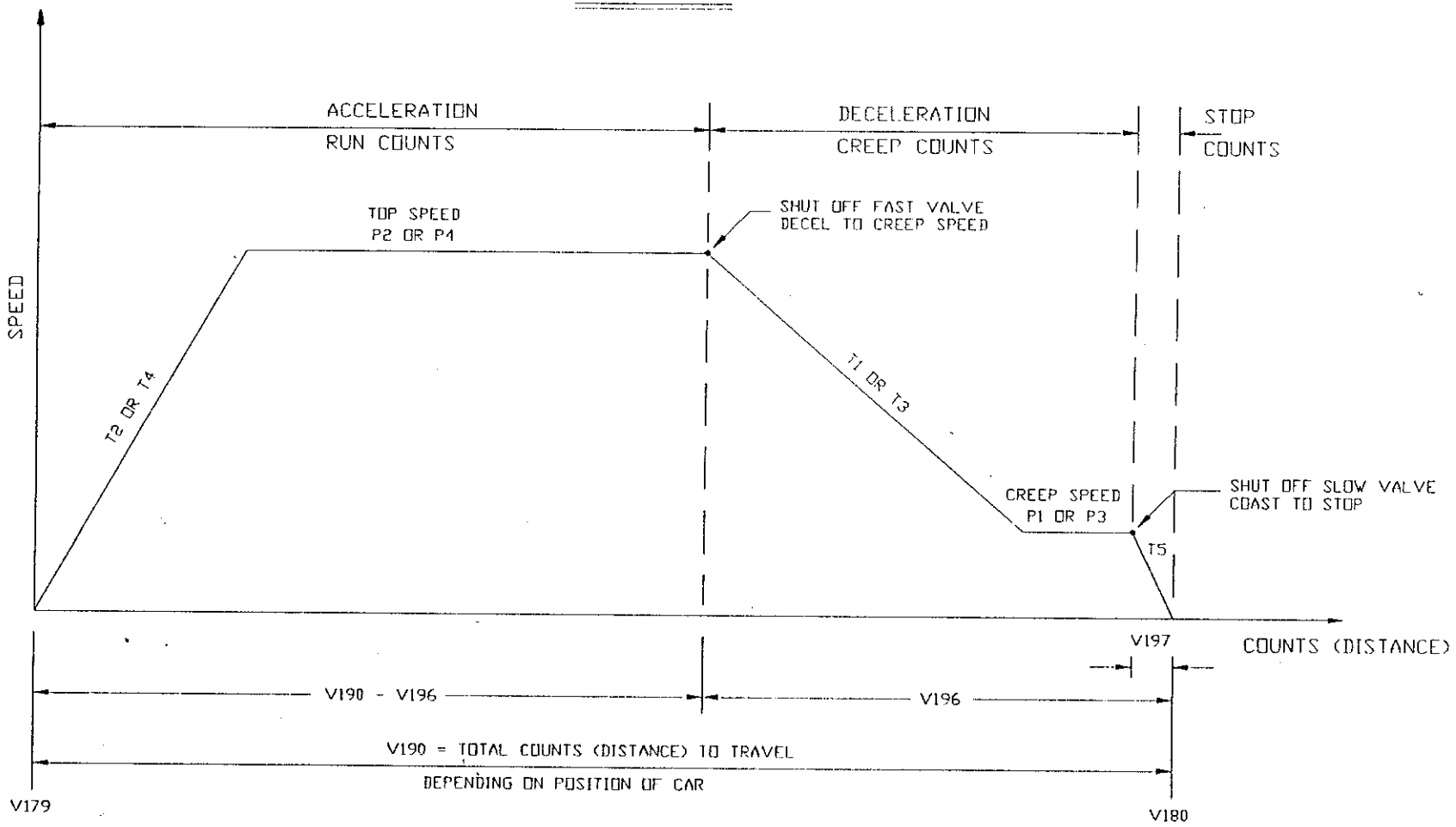
Pass #	Timer
1	V631 =
2	V632 =
3	V633 =
4	V634 =
5	V635 =
6	V636 =
7	V637 =
8	V638 =
9	V639 =
10	V640 =
11	V641 =
12	V642 =

UK Pass # Pointer V629

Temp location for Alarm V628

This alarm table represents how long the upcar will take to go into the Unload kiln to pick up a rack. This table will change if you rearrange the rack location. The Value from this table will be moved into V628 according to the UK pass number pointer, V629. Then, the value in V628 will be moved into TMR 9 in the program and TMR 9 will start as soon as the Upcar gets off the Upcar on Locar switch. If the Upcar is not getting back onto the Locar in the set amount of time, the alarm will turn on to notify the operator. (600 = 60.0 sec.)

CAR MOTION



V179 - ACTUAL CAR POSITION (COUNTS)
V180 - COUNT # THAT CAR GOING TO (DESTINATION)
V181 - REMAINING COUNTS TO TRAVEL FOR CAR
V190 - TOTAL COUNTS TO TRAVEL
V196 - TOTAL CREEP COUNTS
V197 - # OF COUNTS FOR CAR TO COAST TO STOP

P1 - FORWARD SLOW OR CREEP SPEED SETPOINT
P2 - FORWARD FAST OR TOP SPEED SETPOINT
P3 - REVERSE SLOW OR CREEP SPEED SETPOINT
P4 - REVERSE FAST OR TOP SPEED SETPOINT

T2 - FORWARD ACCELERATION FROM 0 TO TOP SPEED
T1 - FORWARD DECELERATION FROM TOP TO CREEP SPEED
T4 - REVERSE ACCELERATION FROM 0 TO TOP SPEED
T3 - REVERSE DECELERATION FROM TOP TO CREEP SPEED
T5 - DECELERATION FROM CREEP SPEED TO ZERO

DIRECTION & COUNTS CALCULATION

* FORWARD:

V180 [ ] > V179 [ ]

* TOTAL COUNTS TO TRAVEL FORWARD:

V190 [ ] = V180 [ ] - V179 [ ]

* REMAINING COUNTS TO TRAVEL FORWARD:

V181 [ ] = V180 [ ] - V179 [ ]

* REVERSE:

V179 [ ] > V180 [ ]

* TOTAL COUNTS TO TRAVEL REVERSE:

V190 [ ] = V179 [ ] - V180 [ ]

* REMAINING COUNTS TO TRAVEL REVERSE:

V181 [ ] = V179 [ ] - V180 [ ]

* SHUT OFF FAST VALVE - DECEL TO CREEP SPEED:

V181 [ ] < V196 [ ]

* SHUT OFF SLOW VALVE - COAST TO STOP:

V181 [ ] < V197 [ ]

V179 - ACTUAL CAR POSITION (COUNTS)
V180 - COUNT # THAT CAR GOING TO (DESTINATION)
V181 - REMAINING COUNTS TO TRAVEL FOR CAR
V190 - TOTAL COUNTS TO TRAVEL
V196 - TOTAL CREEP COUNTS
V197 - # OF COUNTS FOR CAR TO COAST TO STOP

COUNTS # THAT LOCAR GOING TO (DESTINATION):

* LOADER TO LOAD KILN:
V195 [ ]
* LOAD KILN TO UNLOAD KILN:
V193 [ ]
* UNLOAD KILN TO UNLOADER:
V192 [ ]
* UNLOADER TO LOADER:
V194 [ ]
* BYPASS #1 - LOADER TO UNLOADER:
V192 [ ]
* BYPASS #1 - UNLOADER TO LOADER:
V194 [ ]
* BYPASS #2 - LOAD KILN TO LOADER:
V194 [ ]

→ V180 [ ]

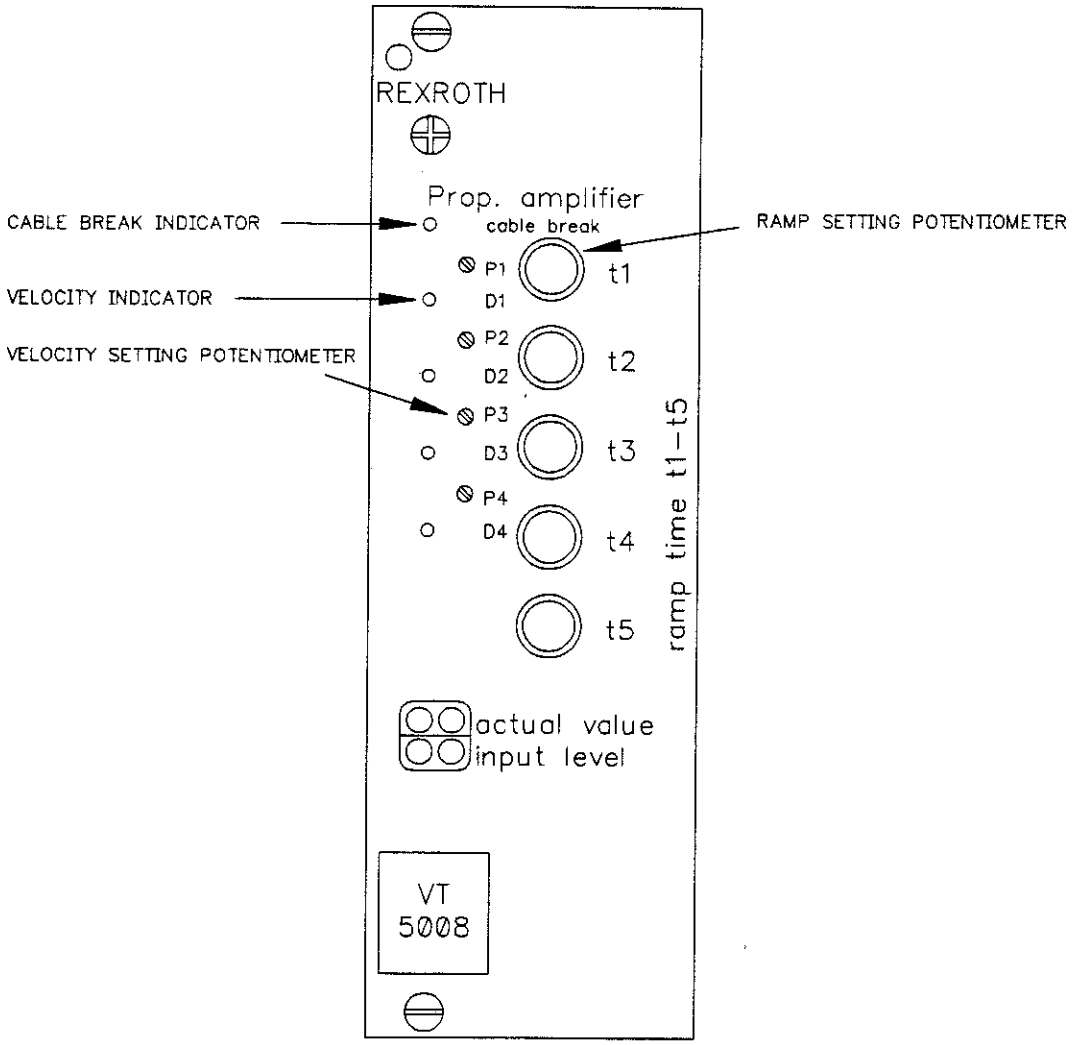
LOCAR TOTAL CREEP COUNTS:

* LOADER TO LOAD KILN:
V307 [ ]
* LOAD KILN TO UNLOAD KILN:
V308 [ ]
* UNLOAD KILN TO UNLOADER:
V309 [ ]
* UNLOADER TO LOADER:
V310 [ ]
* BYPASS #1 - LOADER TO UNLOADER:
V311 [ ]
* BYPASS #1 - UNLOADER TO LOADER:
V310 [ ]
* BYPASS #2 - LOAD KILN TO LOADER:
V307 [ ]

→ V196 [ ]

ELECTRONIC AMPLIFIER CARD VT-5008

FACE PLATE



⊘ VELOCITY SETTING POTENTIOMETERS

P1 – FORWARD SLOW OR CREEP SPEED
P2 – FORWARD FAST SPEED
P3 – REVERSE SLOW OR CREEP SPEED
P4 – REVERSE FAST SPEED

NOTE: A clockwise rotation of a pot will increase the Velocity set point.

○ LEDS for visual reference of which input relay is energized.

◯ RAMP SETTING POTENTIOMETERS

T2 – FORWARD ACCELERATION FROM Ø TO FAST SPEED
T1 – FORWARD DECELERATION FROM FAST TO CREEP SPEED
T4 – REVERSE ACCELERATION FROM Ø TO FAST SPEED
T3 – REVERSE DECELERATION FROM FAST TO CREEP SPEED
T5 – DECELERATION FROM CREEP TO Ø

NOTE: A clockwise rotation of a pot will increase the Ramp time.

UPCAR ELECTRONIC AMPLIFIER CARD VT-5008

The Electronic Amplifier card Model VT 5008 converts an input voltage signal proportionally into output current to power proportional solenoids. Dependent on the amount of current to the solenoid, the force is proportionally transmitted to the valves. The VT 5008 electronic amplifier controls Model 4 WRE directional control valves with positional feedback.

The 24 Volts input voltage from the power supply on pin 22ac and 28ac powers the card and is also fed thru a voltage regulator which filters, suppresses and smooths the voltage and divides its 18 Volts output over pins 26a and 24a with reference potential to "measured zero" on pin 26c. From pins 26a and 24a the +9 Volts and -9 Volts is used as command input signals to the amplifier at pin 14c, 14a, 20c, 20a.

Pins 14c & 14a is connected to pin 24a which is -9 Volts and that is used for one direction. Pins 20c & 20a is connected to pin 26a which is +9 Volts and that is used for the other direction. **To change direction**, connect +9 volts on pin 26a to pin 14c & 14a and -9 volts on pin 24a to pin 20c & 20a respectively.

Pins 2c & 32c is connected to Solenoid "B". Pins 2a & 32a is connected to Solenoid "A". **These two cables should not be switched for the system to work properly.**

VELOCITY SETTING:

There are four (4) internal potentiometers on the face plate of the VT.5008 card located in the Upcar panel which offers the setting of 4 velocity set points or the Fast and Slow speed of the Upcar. These potentiometers are label as follows:

P1 - Forward slow or creep speed
P2 - Forward fast speed
P3 - Reverse slow or creep speed
P4 - Reverse fast speed

The reference voltages of +9 VDC and -9 VDC are provided to power the command set point potentiometers. The polarity of the signals control the direction of flow for the extend or retract cycles of the actuator. The maximum flow would be proportional to the magnitude of the potentiometer command set point.

In order to set the fast speed for both directions to the same set point, connect the Voltmeter to the test points on the face plate of the VT 5008 card. Manually energize relay CR2 (Fast Speed Forward Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to +6 volts. A clockwise rotation of the potentiometer will increase the setting value. On the other hand, energize relay CR4 (Fast Speed Reverse Relay) the value should be between 0 to -6 volts. Repeat the same procedure for the slow speed for both directions.

There are 4 associated LEDs on the face plate to permit fast visual reference of which input relay is energized.

Also, there is a cable break detector that continuously monitors the cable connection of the feedback. In the case of a cable break the valve "fails safe" removing power from the solenoid. A LED located on the face plate provides visual indication that the feedback wires or cable have been disconnected.

When the Upcar accelerates, it energizes both the Fast & Slow outputs; however, if more than one (1) channel is selected, the channel with the highest number has priority.

For example:

If the Upcar accelerates in the reverse direction, both P3 and P4 will be ON, but P4 will have priority over P3. Therefore, the Upcar will accelerate to the velocity preset of P4. When the Upcar completes all the Accel + Run counts, P4 turns OFF. At this point, the Upcar decelerates to the velocity preset of P3 which is the slow or creep speed.

RAMP SETTING:

There are five (5) potentiometers on the face plate of the VT-5008 that offers accessible ramp control for each individual input command. The ramp generator distributes a stepped input signal into a slowly increasing output signal over an adjustable time period. The time or "slope" of the output signal curve may be adjusted for both "up" and "down" ramps. Each preset P1 - P4 has a corresponding ramp time adjustment, T1 thru T4. These potentiometers are adjustable from the card face plate and allow signal vs. time ramping of up to 20 seconds. A clockwise rotation of a trim pot will increase the ramp time. When all of the preset relays are de-energized, ramp T5 controls the centering time of the valve.

T2 - Upcar forward acceleration from 0 to fast speed
T1 - Upcar forward deceleration from fast to creep speed

T4 - Upcar reverse acceleration from 0 to fast speed
T3 - Upcar reverse deceleration from fast to creep speed

T5 - Upcar deceleration from creep speed to 0.

UPCAR VELOCITY (SPEED) SETTING:

There are four (4) internal potentiometers on the face plate of the VT 5008 card located in the Upcar panel which offers the setting of 4 velocity set points or the Fast and Slow speed of the Car. These potentiometers are label as follows:

P1 - Forward slow or creep speed
P2 - Forward fast speed
P3 - Reverse slow or creep speed
P4 - Reverse fast speed

In order to set the velocity (speed) for both direction, connect the Voltmeter to the test points (input value) on the face plate of the VT 5008 card.

* Forward slow or creep speed (0 to +6 volts):
  - Manually energize relay **CR1** (Forward Slow Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to +6 volts. A clockwise rotation of the potentiometer will increase the setting value.

    P1: Upcar Forward Slow _____ volts.

* Forward fast or top speed (0 to +6 volts):
  - Manually energize relay **CR2** (Forward Fast Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to +6 volts. A clockwise rotation of the potentiometer will increase the setting value.

    P2: Upcar Forward Fast _____ volts.

* Reverse slow or creep speed (0 to -6 volts):
  - Manually energize relay **CR3** (Reverse Slow Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to -6 volts. A clockwise rotation of the potentiometer will increase the setting value.

    P3: Upcar Reverse Slow _____ volts.

* Reverse fast or top speed (0 to -6 volts):
  - Manually energize relay **CR4** (Reverse Fast Speed Relay) by pressing the red button on the top of the relay, the value on the Voltmeter should be between 0 to -6 volts. A clockwise rotation of the potentiometer will increase the setting value.

    P4: Upcar Reverse Fast _____ volts.

UPCAR ACCELERATION & DECELERATION (RAMP) SETTING:

There are five (5) potentiometers on the face plate of the VT-5008 that offers accessible ramp control for each individual input command. The ramp generator distributes a stepped input signal into a slowly increasing output signal over an adjustable time period. The time or "slope" of the output signal curve may be adjusted for both "up" and "down" ramps. Each preset P1 - P4 has a corresponding ramp time adjustment T1 thru T4. These potentiometers are adjustable from the card face plate and allow signal vs. time ramping of up to 20 second. A clockwise rotation of a trim pot will increase the ramp time. When all of the preset relays are de-energized, ramp T5 controls the centering time of the valve.

T2 - Upcar forward acceleration from 0 to fast speed
T1 - Upcar forward deceleration from fast to creep speed

T4 - Upcar reverse acceleration from 0 to fast speed
T3 - Upcar reverse deceleration from fast to creep speed

T5 - Upcar deceleration from creep speed to 0.

In order to set the ramp rates for both direction, connect the Voltmeter to the test points (input value) on the face plate of the VT 5008 card. This procedure will be done after you already set the velocity (speed) set points for both direction.

* T2: Forward acceleration from 0 to fast speed:
  - Start the clock as you manually energize both relays **CR2** (Forward Fast Speed Relay) and **CR1** (Forward Slow Speed Relay) by pressing the red buttons on the top of the relays, the value on the Voltmeter should begin increasing from 0 to the fast speed set points. As soon as the value on the Voltmeter equal to your fast speed setting, stop the clock. That will be how long it takes to accelerate from 0 to fast speed. A clockwise rotation of the potentiometer will increase the setting value.

  T2: Upcar Forward Acceleration _____ seconds.

* T1: Forward deceleration from fast to creep speed:
  - Start the clock as soon as you manually de-energized relay **CR2** (Forward Fast Speed Relay) by releasing the red button on the top of the relay 2, the value on the Ohmmeter should begin decreasing from the fast speed setting (volts) to slow speed setting (volts). As soon as the value on the Ohmmeter equal to your slow speed setting, stop the clock. That will be how long it takes to decelerate from fast to slow speed. A clockwise rotation of the potentiometer will increase the setting value.

  T1: Upcar Forward Deceleration _____ seconds.

* T5: Deceleration from creep speed to 0:
  - Start the clock as soon as you manually de-energized relay **CR1** (Forward Slow Speed Relay) by releasing the red button on the top of the relay 1, the value on the Voltmeter should begin decreasing from the slow speed setting (volts) to 0. As soon as the value on the Voltmeter equal 0, stop the clock. That will be how long it takes to decelerate from slow speed to 0. A clockwise rotation of the potentiometer will increase the setting value.

  T5: Upcar Deceleration from creep to 0 _____ seconds.

* T4: Reverse acceleration from 0 to fast speed:
  - Start the clock as you manually energize both relays **CR4** (Reverse Fast Speed Relay) and **CR3** (Reverse Slow Speed Relay) by pressing the red buttons on the top of the relays, the value on the Voltmeter should begin increasing from 0 to the fast speed set points. As soon as the value on the Voltmeter equal to your fast speed setting, stop the clock. That will be how long it takes to accelerate from 0 to fast speed. A clockwise rotation of the potentiometer will increase the setting value.

  T4: Upcar Reverse Acceleration _____ seconds.

* T3: Reverse deceleration from fast to creep speed:
  - Start the clock as soon as you manually de-energized relay **CR4** (Reverse Fast Speed Relay) by releasing the red button on the top of the relay 4, the value on the Voltmeter should begin decreasing from the fast speed setting (volts) to slow speed setting (volts). As soon as the value on the Voltmeter equal to your slow speed setting, stop the clock. That will be how long it takes to decelerate from fast to slow speed. A clockwise rotation of the potentiometer will increase the setting value.

  T3: Upcar Reverse Deceleration _____ seconds.

UPCAR LOCATION (COUNTS) SETTING

The origin of the Upcar is in the Loader area of the rack conveyor. Therefore, that position will be the reference point or V194 = 1000.

- Reset the counter WX50 by pressing the "RESET" button on the Upcar pushbutton panel (WX50 = 0).

  NOTE: For counts setting, only RESET the Upcar at the origin.

- Manually move the Upcar to the Home position or Upcar on Locar by pressing the forward button on the remote control unit. WX50 should start increasing as soon as you move.

  1 count = 0.0314 in. One revolution = 800 counts = 6 * 3.1416

- When you get to the destination (Home position) and stoped, the number in WX50 is the number of counts between the Loader and Upcar on Locar position. Since our Origin starts at 1000, the Home position or Upcar on Locar position (V170) = WX50 + 1000.

- Mannually move the Locar to the Unloader.

  Manually move the Upcar reverse until the Rack on the Upcar clear the Unloader area, the number in WX50 is the number of counts between the Home position and the Unloader. Since our Origin starts at 1000, the Unloader position (V192) = WX50 + 1000.

- Manually move the Locar to the Load Kiln.

  Manually move the Upcar to Pass # 1 position and stoped, the number in WX50 is the number of counts between the Home position and Pass # 1 position. Since our Origin starts at 1000, Pass # 1 position (V201) = WX50 + 1000.

  Repeat the same procedure until getting to the last Pass in the Load Kiln.

- Manually move the Locar to the Unload Kiln.

  Manually moving the Upcar forward until the Pallets on Upcar switch activated for Pass # 1, the number in WX50 is the number of counts between the Home position and Pass # 1 position. Since our Origin starts at 1000, Pass # 1 position (V241) = WX50 + 1000.

  Repeat the same procedure until getting to the last Pass in the Unload Kiln.

- To double check, manually move the Upcar in the opposite direction, WX50 should decreasing as soon as you move. When the get back on the Locar, WX50 should equal to V170.

The Upcar is accelerated to the set maximum speed and allowed to travel until it is at a "preset" distance (V196 - desired creep distance) from the desired location. Then the Upcar begins to decelerate to the set minimum speed and travel at this speed until one of these conditions is true:

- it is at a desired distance for the car to stop (V197).
- Pallets on Upcar switch activated. (Loader & Unload Kiln)
- Upcar on Locar switch activated. (Home position)

V179 - Actual Upcar position (represented by count)

V180 - Destination that Upcar going to (represented by count)

V181 - Remaining counts for Upcar to travel

V196 - Desired creep distance (represented by count)

V197 - Desired distance for Upcar to decel to 0 (by count)

Note that the DESIRED CREEP DISTANCE can not be set to a value equal to or greater than the distance between the actual car position and the destination that car going to. If this occurs, a negative setting is produced and the car will not move.

Also, the DESIRED CREEP DISTANCE should be long enough for the car to decelerate smoothly from fast to creep speed without forcing the pump or overshoot the destination. However, if that distance is reached before the car has had time to reach the top speed setting, acceleration will be terminated and the car will decel toward creep speed.

UPCAR LOCATION (COUNTS) SETTING

HOME POS.

UPCAR ON LOCAR

V170

ORIGIN

LOADER

1000

V194

HOME POS.

UPCAR ON LOCAR

V170

UNLOADER

V192

HOME POS.

LOAD KILN PASS NO.

UPCAR ON LOCAR

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
V215	V214	V213	V212	V211	V210	V209	V208	V207	V206	V205	V204	V203	V202	V201

V170

HOME POS.

UNLOAD KILN PASS NO.

UPCAR ON LOCAR

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
V241	V242	V243	V244	V245	V246	V247	V248	V249	V250	V251	V252	V253	V254	V255

V170

UPCAR COUNTS TABLE: LOADER & UNLOADER

Counts to Rack position in the Unloader:

V192 =

Creep counts from the Home position to Rack position in the Unloader:

V172 =

Creep counts from Rack position in the Unloader to the Home position:

V171 =

Counts to Rack position in the Loader from the Home position:

V194 =

Creep counts from the Home position to Rack position in the Loader:

V174 =

Creep counts from Rack position in the Loader to the Home position:

V176 =

Counts at Home position:

V170 =

Counts needed for car to decel from creep to zero:

V197 = 5

(Normally 5 to 10 counts)

UPCAR COUNTS TABLE: LOAD KILN COUNTS

Pass #	# of counts
1	V201 =
2	V202 =
3	V203 =
4	V204 =
5	V205 =
6	V206 =
7	V207 =
8	V208 =
9	V209 =
10	V210 =
11	V211 =
12	V212 =
13	V213 =
14	V214 =
15	V215 =

LK Pass # Pointer V188

LK counts Temp location V195

This table represents the actual total number of counts to the correct position for the upcar to deliver a rack in the load kiln. This table will change if you rearrange the racks location. The Value from this table will be moved into V195 according to the LK pass number pointer, V188. Then, the value in V195 will be used in the program to determine which direction the Upcar will travel.

UPCAR CREEP COUNTS TABLE: GOING INTO LOAD KILN

Pass #	# of counts
1	V401 =
2	V402 =
3	V403 =
4	V404 =
5	V405 =
6	V406 =
7	V407 =
8	V408 =
9	V409 =
10	V410 =
11	V411 =
12	V412 =
13	V413 =
14	V414 =
15	V415 =

LK Pass # Pointer V399

Creep counts Temp loc. V175

This table represents the total number of creep counts to the correct position for the upcar to deliver a rack in the load kiln. The deceleration distants will change if you change this table. The Value from this table will be moved into V175 according to the LK pass number pointer, V399. Then, the value in V175 will be used in the program (V196) to determine when to shut off the FAST valve and slow down to creep speed.

UPCAR CREEP COUNTS TABLE: GOING OUT OF LOAD KILN

Pass #	# of counts
1	V431 =
2	V432 =
3	V433 =
4	V434 =
5	V435 =
6	V436 =
7	V437 =
8	V438 =
9	V439 =
10	V440 =
11	V441 =
12	V442 =
13	V443 =
14	V444 =
15	V445 =

LK Pass # Pointer V429

Creep counts Temp loc. V185

This table represents the total number of creep counts to the correct position for the upcar to deliver a rack in the load kiln. The deceleration distants will change if you change this table. The Value from this table will be moved into V185 according to the LK pass number pointer, V429. Then, the value in V185 will be used in the program (V196) to determine when to shut off the FAST valve and slow down to creep speed.

UPCAR COUNTS TABLE: UNLOAD KILN COUNTS

Pass #	# of counts
1	V241 =
2	V242 =
3	V243 =
4	V244 =
5	V245 =
6	V246 =
7	V247 =
8	V248 =
9	V249 =
10	V250 =
11	V251 =
12	V252 =
13	V253 =
14	V254 =
15	V255 =

UK Pass # Pointer V189

UK counts Temp location V193

This table represents the actual total number of counts to the correct position for the upcar to pick up a rack in the Unload kiln. This table will change if you rearrange the racks location. The Value from this table will be moved into V193 according to the UK pass number pointer, V189. Then, the value in V193 will be used in the program to determine which direction the Upcar will travel.

UPCAR CREEP COUNTS TABLE: GOING INTO UNLOAD KILN

Pass #	# of counts
1	V461 =
2	V462 =
3	V463 =
4	V464 =
5	V465 =
6	V466 =
7	V467 =
8	V468 =
9	V469 =
10	V470 =
11	V471 =
12	V472 =
13	V473 =
14	V474 =
15	V475 =

UK Pass # Pointer V459

UK counts Temp location V173

This table represents the total creep counts to the correct position for the upcar to pick up a rack in the Unload kiln. The deceleration distants will change if you change this table. The Value from this table will be moved into V173 according to the UK pass number pointer, V459. Then, the value in V173 will be used in the program (V196) to determine when to shut off the FAST valve and slow down to creep speed.

UPCAR CREEP COUNTS TABLE: GOING OUT OF UNLOAD KILN

Pass #	# of counts
1	V501 =
2	V502 =
3	V503 =
4	V504 =
5	V505 =
6	V506 =
7	V507 =
8	V508 =
9	V509 =
10	V510 =
11	V511 =
12	V512 =
13	V513 =
14	V514 =
15	V515 =

UK Pass # Pointer V499

UK counts Temp location V183

This table represents the total creep counts to the Home position for the upcar after picking up a rack in the Unload kiln. The deceleration distants will change if you change this table. The Value from this table will be moved into V183 according to the UK pass number pointer, V499. Then, the value in V183 will be used in the program (V196) to determine when to shut off the FAST valve and slow down to creep speed.

PROCEDURE FOR RESETTING & PUT THE RTS CARS IN AUTOMATIC:

A. Upcar lost power at Loader - going in to pick up the rack:

1. Take Locar out of Auto by push in the AUTOMATIC button on the Locar control panel.
2. Pull on UPCAR POWER button on the Locar control panel.
3. Manually bring the Upcar back to the Locar by using the Upcar remote control unit. Make sure the Upcar deck is in the down position.
4. Check Main RTS panel for Load Kiln #, Unload Kiln # , and Pass # on the Panelmate page 9.
5. Reset the Locar by pressing the RESET button on the Locar control panel.
6. Go to page 1 on the Locar Panelmate, wait for the information from the Main panel to appear on the following templates & confirm the information:
   - . Load Rail # from Main panel.
   - . Unload Rail # from Main panel.
   - . Pass # from Main panel.
7. Reset the Upcar by pressing the RESET button on the Upcar pushbutton station.
8. Reset the Upcar counter by selecting PASS # RESET selector switch on the Upcar P.B.
9. Step the Upcar counter to the ***previous pass #*** by selecting PASS # STEP selector switch on the Upcar pushbutton station.
10. Put Upcar in Automatic by pulling on the AUTOMATIC button on the Upcar P.B.
11. Put Locar in Automatic by pulling on the AUTOMATIC button on the Locar control panel.

B. Upcar lost power at Loader - going back to Locar with the rack:

NOTE: DO NOT RESET LOCAR

1. Take Locar out of Auto by push in the AUTOMATIC button on the Locar control panel.
2. Pull on UPCAR POWER button on the Locar control panel.
3. Manually bring the Upcar back to the Locar by using the Upcar remote control unit. Make sure the Upcar deck is in the up position.
4. Reset the Upcar by pressing the RESET button on the Upcar pushbutton station.
5. Reset the Upcar counter by selecting PASS # RESET selector switch on the Upcar P.B.
6. Step the Upcar counter to the ***current pass #*** by selecting PASS # STEP selector switch on the Upcar pushbutton station.
7. Put Upcar in Automatic by pulling on the AUTOMATIC button on the Upcar P.B.
8. Go to page 4 on the Locar Panelmate,
   - . Top template should display 'AT LOADER'
   - . Depress the touch panel membrane keypad that corresponds to the top template. This will bring up control labeled 'DRUM 1 MAN STEP'.
   - . Depress the DRUM 1 MAN STEP control keypad, this will step the Locar/Upcar EDRUM until the template display 'LOADER TO LOAD KILN'.
9. Put Locar in Automatic by pulling on the AUTOMATIC button on the Locar control panel.
10. The Locar should automatically undock and travel to the pre-define Load Kiln.

PROCEDURE FOR RESETTING & PUT THE RTS CARS IN AUTOMATIC:

A. <u>Upcar lost power at Load Kiln - going in to deliver the rack:</u>

NOTE: DO NOT RESET LOCAR

1. Take Locar out of Auto by push in the AUTOMATIC button on the Locar control panel.
2. Pull on UPCAR POWER button on the Locar control panel.
3. Manually bring the Upcar back to the Locar by using the Upcar remote control unit. Make sure the Upcar deck is in the up position.
4. Reset the Upcar by pressing the RESET button on the Upcar pushbutton station.
5. Reset the Upcar counter by selecting PASS # RESET selector switch on the Upcar P.B.
6. Step the Upcar counter to the ***<u>current pass #</u>*** by selecting PASS # STEP selector switch on the Upcar pushbutton station.
7. Put Upcar in Automatic by pulling on the AUTOMATIC button on the Upcar P.B.
8. Go to page 4 on the Locar Panelmate, Top template should display 'AT LOAD KILN'.
9. Go to page 5 on the Locar Panelmate, Top template should display 'AT LOAD KILN'.
   - Using the keypad to select 'UPCAR TESTING'.
   - Depress the control labeled 'CHANGE VALUE'.
   - Using the numeric keypad, enter a **'7' which is at Load Kiln signal.**
     The value '7' will appear in the 'PULSE # TO UPCAR' template.
     Wait for the confirmation signal '7' to display in the 'PULSE # FRM UPCAR' template.
     If the signal is confirmed (equal), both template will be reset to 0.
   - Using the numeric keypad, enter a **'pass number + 10' signal.**
     The pass number + 10 value will appear in the 'PULSE # TO UPCAR' template.
     Wait for the confirmation signal to display in the 'PULSE # FRM UPCAR' template.
     If the signal is confirmed (equal), both template will be reset to 0.
   - Using the numeric keypad, enter a **'2' which is OK to go signal.**
     The value '2' will appear in the 'PULSE # TO UPCAR' template.
     As soon as the Upcar receive the value '2', it will enter the Load Kiln to deliver the rack.
10. Put Locar in Automatic by pulling on the AUTOMATIC button on the Locar control panel.

PROCEDURE FOR RESETTING & PUT THE RTS CARS IN AUTOMATIC:

B. Upcar lost power at Load Kiln - going back to Locar without the rack:

NOTE: DO NOT RESET LOCAR

1. Take Locar out of Auto by push in the AUTOMATIC button on the Locar control panel.
2. Pull on UPCAR POWER button on the Locar control panel.
3. Manually bring the Upcar back to the Locar by using the Upcar remote control unit. Make sure the Upcar deck is in the down position.
4. Reset the Upcar by pressing the RESET button on the Upcar pushbutton station.
5. Reset the Upcar counter by selecting PASS # RESET selector switch on the Upcar P.B.
6. Step the Upcar counter to the ***previous pass #*** by selecting PASS # STEP selector switch on the Upcar pushbutton station.
7. Put Upcar in Automatic by pulling on the AUTOMATIC button on the Upcar P.B.
8. Go to page 4 on the Locar Panelmate,
   - . Top template should display 'AT LOAD KILN'
   - . Depress the touch panel membrane keypad that corresponds to the top template. This will bring up control labeled 'DRUM 1 MAN STEP'.
   - . Depress the DRUM 1 MAN STEP control keypad, this will step the Locar/Upcar EDRUM until the template display 'LOAD KILN TO UNLOAD KILN'.
9. Put Locar in Automatic by pulling on the AUTOMATIC button on the Locar control panel.
10. The Locar should automatically undock and travel to the pre-define Unload Kiln.

PROCEDURE FOR RESETTING & PUT THE RTS CARS IN AUTOMATIC:

A. Upcar lost power at Unload Kiln - going in to pick up the rack:

NOTE: DO NOT RESET LOCAR

1. Take Locar out of Auto by push in the AUTOMATIC button on the Locar control panel.
2. Pull on UPCAR POWER button on the Locar control panel.
3. Manually bring the Upcar back to the Locar by using the Upcar remote control unit. Make sure the Upcar deck is in the down position.
4. Reset the Upcar by pressing the RESET button on the Upcar pushbutton station.
5. Reset the Upcar counter by selecting PASS # RESET selector switch on the Upcar P.B.
6. Step the Upcar counter to the ***previous pass #*** by selecting PASS # STEP selector switch on the Upcar pushbutton station.
7. Put Upcar in Automatic by pulling on the AUTOMATIC button on the Upcar P.B.
8. Go to page 4 on the Locar Panelmate, Top template should display 'AT UNLOAD KILN'.
9. Go to page 5 on the Locar Panelmate, Top template should display 'AT UNLOAD KILN'.
   - . Using the keypad to select 'UPCAR TESTING'.
   - . Depress the control labeled 'CHANGE VALUE'.
   - . Using the numeric keypad, enter a **'8' which is at UNLOAD KILN signal.**
     The value '8' will appear in the 'PULSE # TO UPCAR' template.
     Wait for the confirmation signal '8' to display in the 'PULSE # FRM UPCAR' template.
     If the signal is confirmed (equal), both template will be reset to 0.
   - . Using the numeric keypad, enter a **'pass number + 10' signal.**
     The pass number + 10 value will appear in the 'PULSE # TO UPCAR' template.
     Wait for the confirmation signal to display in the 'PULSE # FRM UPCAR' template.
     If the signal is confirmed (equal), both template will be reset to 0.
   - . Using the numeric keypad, enter a **'2' which is OK to go signal.**
     The value '2' will appear in the 'PULSE # TO UPCAR' template.
     As soon as the Upcar receive the value '2', it will enter the Unload Kiln to pick up.
10. Put Locar in Automatic by pulling on the AUTOMATIC button on the Locar control panel.

PROCEDURE FOR RESETTING & PUT THE RTS CARS IN AUTOMATIC:

B. Upcar lost power at Unload Kiln - going back to Locar with the rack:

NOTE: DO NOT RESET LOCAR

1. Take Locar out of Auto by push in the AUTOMATIC button on the Locar control panel.
2. Pull on UPCAR POWER button on the Locar control panel.
3. Manually bring the Upcar back to the Locar by using the Upcar remote control unit. Make sure the Upcar deck is in the up position.
4. Reset the Upcar by pressing the RESET button on the Upcar pushbutton station.
5. Reset the Upcar counter by selecting PASS # RESET selector switch on the Upcar P.B.
6. Step the Upcar counter to the ***current pass #*** by selecting PASS # STEP selector switch on the Upcar pushbutton station.
7. Put Upcar in Automatic by pulling on the AUTOMATIC button on the Upcar P.B.
8. Go to page 4 on the Locar Panelmate,
   - . Top template should display 'AT UNLOAD KILN'
   - . Depress the touch panel membrane keypad that corresponds to the top template. This will bring up control labeled 'DRUM 1 MAN STEP'.
   - . Depress the DRUM 1 MAN STEP control keypad, this will step the Locar/Upcar EDRUM until the template display 'UNLOAD KILN TO UNLOADER'.
9. Put Locar in Automatic by pulling on the AUTOMATIC button on the Locar control panel.
10. The Locar should automatically undock and travel to the Unloader.

PROCEDURE FOR RESETTING & PUT THE RTS CARS IN AUTOMATIC:

A. <u>Upcar lost power at Unloader - going in to deliver the rack:</u>

NOTE: DO NOT RESET LOCAR

1. Take Locar out of Auto by push in the AUTOMATIC button on the Locar control panel.
2. Pull on UPCAR POWER button on the Locar control panel.
3. Manually bring the Upcar back to the Locar by using the Upcar remote control unit. Make sure the Upcar deck is in the up position.
4. Reset the Upcar by pressing the RESET button on the Upcar pushbutton station.
5. Reset the Upcar counter by selecting PASS # RESET selector switch on the Upcar P.B.
6. Step the Upcar counter to the ***<u>current pass #</u>*** by selecting PASS # STEP selector switch on the Upcar pushbutton station.
7. Put Upcar in Automatic by pulling on the AUTOMATIC button on the Upcar P.B.
8. Go to page 4 on the Locar Panelmate, Top template should display 'AT UNLOADER'.
9. Go to page 5 on the Locar Panelmate, Top template should display 'AT UNLOADER'.
   - . Using the keypad to select 'UPCAR TESTING'.
   - . Depress the control labeled 'CHANGE VALUE'.
   - . Using the numeric keypad, enter a **'6' which is at UNLOADER signal.**
     The value '6' will appear in the 'PULSE # TO UPCAR' template.
     Wait for the confirmation signal '6' to display in the 'PULSE # FRM UPCAR' template.
     If the signal is confirmed (equal), both template will be reset to 0.
   - . Using the numeric keypad, enter a **'2' which is OK to go signal.**
     Make sure the Unloader conveyor is opened.
     The value '2' will appear in the 'PULSE # TO UPCAR' template.
     As soon as the Upcar receive the value '2', it will enter the Unloader to deliver the rack.
10. Put Locar in Automatic by pulling on the AUTOMATIC button on the Locar control panel.

PROCEDURE FOR RESETTING & PUT THE RTS CARS IN AUTOMATIC:

B. Upcar lost power at Unloader - going back to Locar without the rack:

NOTE: DO NOT RESET LOCAR

1. Take Locar out of Auto by push in the AUTOMATIC button on the Locar control panel.
2. Pull on UPCAR POWER button on the Locar control panel.
3. Manually bring the Upcar back to the Locar by using the Upcar remote control unit. Make sure the Upcar deck is in the down position.
4. Reset the Upcar by pressing the RESET button on the Upcar pushbutton station.
5. Reset the Upcar counter by selecting PASS # RESET selector switch on the Upcar P.B.
6. Step the Upcar counter to the ***previous pass #*** by selecting PASS # STEP selector switch on the Upcar pushbutton station.
7. Put Upcar in Automatic by pulling on the AUTOMATIC button on the Upcar P.B.
8. Go to page 4 on the Locar Panelmate,
   - . Top template should display 'AT UNLOADER'
   - . Depress the touch panel membrane keypad that corresponds to the top template. This will bring up control labeled 'DRUM 1 MAN STEP'.
   - . Depress the DRUM 1 MAN STEP control keypad, this will step the Locar/Upcar EDRUM until the template display 'UNLOADER TO LOADER'.
9. Put Locar in Automatic by pulling on the AUTOMATIC button on the Locar control panel.
10. The Locar should automatically undock and travel to the Loader.